

Deliverable 3.3.1

“Guidelines for sustainable capitalization of cultural services related to education and social inclusion”

Guidelines for sustainable capitalization of cultural services related to education and social inclusion

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ABBREVIATIONS

Term	Explanation
CBD	Convention on Biological Diversity
CSO	Civil Society Organization
CWR	Crop Wild Relative(s)
FAO	Food and Agriculture Organization of the United Nations
FIGS	Focused Identification of Germplasm Strategy
GIS	Geographical Information System
GPA	Global Plan of Action
GPS	Global Positioning System
GSPC	Global Strategy for Plant Conservation
ITITPG	International Treaty on Plant Genetic Resources
IUCN	International Union for Conservation of Nature
NGO	Non-Governmental Organization
PA	Protected areas
ESD	Educations for sustainable development
PES	Payment for sustainable development
PGR	Plant Genetic Resources
TDWG	Taxonomic Databases Working Group – developing Biodiversity Information Standards

Contents

LIST OF TABLES.....	8
LIST OF FIGURES.....	9
1. EXECUTIVE SUMMARY.....	10
2. ΠΕΡΙΛΗΨΗ.....	11
3. INTRODUCTION - BACKGROUND AND CONCEPTUAL FRAMEWORK OF THE FOREST ECOSYSTEM SERVICES INCLUDED IN THIS DELIVERABLE.....	13
1.1. ECOSYSTEM SERVICES TO BE CAPITALIZED (I.E. REGULATIVE SERVICES, CULTURAL SERVICES), NOMENCLATURE AND TYPOLOGY.....	14
1.2. CAPITALIZATION AND SUSTAINABILITY OF THE ECOSYSTEM SERVICES TARGETED.....	23
2. REVIEW AND ANALYSIS.....	28
2.1. TYPOLOGY OF CAPITALIZATION MECHANISMS FOR ECOSYSTEM SERVICES.....	28
2.2. POTENTIAL ACTIONS, PLANS, INTERVENTIONS, WORKS, MECHANISMS ETC ENSURING SUSTAINABILITY OF THE ECOSYSTEM SERVICES TARGETED.....	31
2.3. POLICIES FOR CAPITALIZATION OF THE ECOSYSTEM SERVICES TARGETED AT GLOBAL, EU, BALKANMED AND NATIONAL LEVEL (I.E. REGULATIVE SERVICES, CULTURAL SERVICES).....	39
2.4. LINKS AMONG CONSERVATION DRIVERS, PRESSURES, ECOSYSTEM SERVICES AND ECONOMIC IMPORTANCE.....	48
CASE STUDIES FOR CAPITALIZATION OF ECOSYSTEM SERVICES TARGETED AND INTERVENTIONS FOR SUSTAINABILITY (INTERNATIONAL, BALKANMED NATIONAL, LOCAL).....	52
2.5. SUSTAINABILITY AND TOURISM.....	60
2.6. HOW TOURISM CAN CONTRIBUTE TO ENVIRONMENTAL CONSERVATION ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT.....	68
2.7. HOW EDUCATION CAN CONTRIBUTE TO ENVIRONMENTAL CONSERVATION.....	76
2.8. HOW TOURISM CAN CONTRIBUTE TO ENVIRONMENTAL CONSERVATION.....	78
2.9. PILOT EDUCATIONAL ACTIONS FOR THE SUSTAINABLE CULTURAL ECOSYSTEM SERVICES DEVELOPMENT- IT ALL STARTS IN THE CLASSROOM.....	80
2.10. GUIDELINES FOR SCHOOLS TO JOIN IN INTERNATIONAL NETWORKS AND EDUCATION PROGRAMS REGARDING SUSTAINABLE ECOSYSTEM SERVICES.....	86
3 GUIDELINES-RECOMMENDATIONS FOR CONSERVATION AND SUSTAINABLE CAPITALIZATION OF ES UNDER STUDY.....	90
4 CONCLUSIONS AND RECOMMENDATIONS.....	96
4.1 STATUS-OBSTACLES AND OPPORTUNITIES.....	96
4.2. POTENTIAL FOR IMPROVEMENT AND REMAINING CHALLENGES.....	100
<i>Increasing Awareness of the Interdependence of Nature and People.....</i>	105
<i>Advancing Science.....</i>	107
4.3. <i>Incorporating Natural Capital and Ecosystem Services into Policy and Management.....</i>	110
5. REFERENCES.....	112

List of Tables

Table 1: Different forms of tourism activity14

Table 2: Ecosystem, service CICES and comparison with MA and TEEB18

Table 3: Ecosystem services and related markets29

List of Figures

Figure 1: Natura areas in Greece	25
Figure 2: FEE EcoCampus	82
Figure 3: A framework for including natural capital in the broader context of formal and informal decision-making	106

1. Executive Summary

Guidelines for sustainable capitalization of cultural services related to education and social inclusion

Since the 1992 Convention on Biological Diversity, calculating and mapping are dominating international debates around biodiversity protection. With the emergence of the Ecosystem Services concept, these calculation and mapping efforts are increasingly imbued with an economic logic which dictates that in order to save biodiversity, the services it provides must be given monetary value. This deliverable attempts a link to the Ecosystem Services concept and the way biodiversity translates into a single measure—a “currency”—related to its services and the guidelines to capitalize in a sustainable manner, the cultural services related to education and social inclusion. Conserving a diversity of life requires acknowledging a diversity of values, knowledge and framings of biodiversity, and fostering a diversity of social–natural relations. Furthermore, local knowledge systems and environmental management practices provide valuable insight and tools for tackling both ecological and cultural challenges, preventing biodiversity and cultural loss, reducing land degradation and heritage destruction and mitigating the effects of climate change.

Culture-led development also includes a range of non-monetized benefits, such as greater social inclusiveness and rootedness, resilience, innovation, creativity and entrepreneurship for individuals and communities, and the use of local resources, skills, and knowledge. Respecting and supporting cultural expressions contribute to strengthening the social capital of a community and fosters trust in public institutions. Cultural factors also influence lifestyles, individual behavior, consumption patterns, values related to environmental stewardship, and our interaction with the natural environment. Local and indigenous knowledge systems and environmental management practices provide valuable insight and tools for tackling ecological challenges, preventing biodiversity loss, reducing land degradation, and mitigating the effects of climate change.

2. Περίληψη

Από τη σύμβαση του 1992 για τη βιοποικιλότητα, η καταμέτρηση και η χαρτογράφηση έχουν κυριαρχήσει στις διεθνείς συζητήσεις γύρω από την προστασία της. Με την εμφάνιση της έννοιας των υπηρεσιών οικοσυστήματος, αυτές οι προσπάθειες καταμέτρησης και χαρτογράφησης όλο και περισσότερο εμπεριέχουν μια οικονομική λογική που υποστηρίζει ότι για τη διάσωση της βιοποικιλότητας, τα αγαθά και οι υπηρεσίες της πρέπει να έχουν χρηματική αξία. Αυτό το παραδοτέο προσφέρει μια ανασκόπηση των υπηρεσιών οικοσυστήματος και ειδικά της πολιτιστικής υπηρεσίας και τον τρόπο με τον οποίο μεταφράζει την ποικιλομορφία της φύσης σε ένα ενιαίο μέτρο - ένα "νόμισμα" που σχετίζεται με τις υπηρεσίες και τις κατευθυντήριες γραμμές για την αειφόρο αξιοποίηση των πολιτιστικών υπηρεσιών που σχετίζονται με την εκπαίδευση και την κοινωνική ένταξη. Η διατήρηση της ποικιλίας της ζωής προϋποθέτει την αναγνώριση μιας ποικιλίας αξιών, γνώσεων και μορφών βιοποικιλότητας και την προώθηση μιας ποικιλίας κοινωνικο-φυσικών σχέσεων. Επιπλέον, τα τοπικά συστήματα γνώσης και οι πρακτικές περιβαλλοντικής διαχείρισης παρέχουν πολύτιμες πληροφορίες και εργαλεία για την αντιμετώπιση τόσο των οικολογικών όσο και των πολιτιστικών προκλήσεων, την πρόληψη της απώλειας της βιοποικιλότητας και τις πολιτιστικές απώλειες, τη μείωση της υποβάθμισης της γης και την καταστροφή της πολιτιστικής κληρονομιάς, καθώς και τον μετριασμό των επιπτώσεων της κλιματικής αλλαγής.

Η ανάπτυξη που καθοδηγείται από τον πολιτισμό περιλαμβάνει επίσης μια σειρά μη κερδοσκοπικών οφελών, όπως η μεγαλύτερη κοινωνική ένταξη και η ριζοσπαστικότητα, η ανθεκτικότητα, η καινοτομία, η δημιουργικότητα και η επιχειρηματικότητα για άτομα και κοινότητες και η χρήση τοπικών πόρων, δεξιοτήτων και γνώσεων. Ο σεβασμός και η υποστήριξη των πολιτιστικών εκφράσεων συμβάλλουν στην ενίσχυση του κοινωνικού κεφαλαίου μιας κοινότητας και ενισχύουν την εμπιστοσύνη στους δημόσιους θεσμούς. Οι πολιτιστικοί παράγοντες επηρεάζουν επίσης τον τρόπο ζωής, την ατομική συμπεριφορά, τα πρότυπα κατανάλωσης, τις αξίες που σχετίζονται με την περιβαλλοντική διαχείριση

και την αλληλεπίδρασή μας με το φυσικό περιβάλλον. Τα τοπικά και εγχώρια συστήματα γνώσης και οι πρακτικές περιβαλλοντικής διαχείρισης παρέχουν πολύτιμη γνώση και εργαλεία για την αντιμετώπιση των οικολογικών προκλήσεων, την αποτροπή της απώλειας βιοποικιλότητας, τη μείωση της υποβάθμισης της γης και την άμβλυνση των επιπτώσεων της κλιματικής αλλαγής.

3. Introduction - Background and conceptual framework of the forest ecosystem services included in this deliverable

The EU Biodiversity Strategy to 2020 requires all the Member States to proceed with "Mapping and Assessment of Ecosystems and their Services" as a key step for implementing the strategy.

The mapping and assessment of ecosystems and ecosystem services is one of the keystones of the EU Biodiversity Strategy. We have to define first what is ecosystem and what services mean. Ecosystem can be defined as “a dynamic complex of plant, animal and microorganism communities and the non-living environment, interacting as a functional unit” (MEA, 2005). The functioning of ecosystem is subjected to the balance of biotic and abiotic factors such as nutrient cycle, food chains and energy fluxes. And these functional ecosystems are pivotal to support life system whereby people utilize the properties and process of ecosystem functions to cater food and manage waste.

Ecosystem functions are defined as the processes of transformation matter and energy within the ecosystems. These processes of ecosystem supply heaps of benefits to human, directly or indirectly. For instance, food derives from ecosystem are the ‘goods’ that benefits human for consumption. While, air purification from the functioning of ecosystem processes are the ‘service’ that nature provided. Therefore, ecosystem services can be defined as tangible or intangible goods that human derive from the processes of functional ecosystem. Ecosystem services are divided into four categories: provisioning, regulating, supporting, and cultural services (TEEB, 2010, 2011, 2012).

Table 1 below summarizes the different forms of tourism activity

Table 1: Different forms of tourism activity

<i>Approach</i>	<i>Conventional tourism</i>	<i>New forms of tourism</i>
Forms of tourism	<ul style="list-style-type: none"> • Sun, sea, and sand tourism (3S) 	Alternative forms of tourism <ul style="list-style-type: none"> • Agrotourism • Ecotourism • Cultural • Trekking • Nature
	Mountain (Winter) tourism	Special interest tourism <ul style="list-style-type: none"> • Conference • Business trips • Maritime • Religious • Health/ spa • Educational • Sport • Adventure
Mode of organisation	<ul style="list-style-type: none"> • Mass tourism • Individuals • Social tourism • Second residence 	<ul style="list-style-type: none"> • Small groups of tourists • Individuals • Social tourism
Tourist behaviour	<ul style="list-style-type: none"> • Indifference • High consumption (depletion of resources) 	<ul style="list-style-type: none"> • Responsibility • Use of resources (not consumption)
State of tourism activity	Non-sustainable tourism	<ul style="list-style-type: none"> • Green tourism • Economically sustainable tourism • Sustainable tourism

1.1. Ecosystem services to be capitalized (i.e. regulative services, cultural services), nomenclature and typology

‘Ecosystem services’ (ES) are the ecological characteristics, functions, or processes that directly or indirectly contribute to human wellbeing: that is, the benefits that people derive from functioning ecosystems Millennium Ecosystem Assessment (MEA), 2005).

Some have argued, that the concept of ecosystem services represents a very 'anthropocentric', instrumental, or utilitarian view of nature – that nature only exists to 'service' humans. However, this simplified view of the concept of ecosystem services. The notion of ecosystem services implies recognition that humans depend for their wellbeing and their very survival on the rest of nature and that Homo sapiens is an integral part of the current biosphere. Secondly, these critics ignore the fact that humans are a biological species and, like all other species, they 'use' the resources in their environment to survive and thrive. Unless we recognize our interdependence with the rest of nature we are putting our species' wellbeing at risk, and at the same time we blindly endanger global ecosystems. So, rather than implying that humans are the only thing that matters, the concept of ecosystem services makes it clear that the whole system matters, both to humans and to the other species we are interdependent with. If anything, the ecosystem services concept is a 'whole system aware' view of humans embedded in society and embedded in the rest of nature. 'Centric' with any prefix doesn't really describe this complex interdependence. Wallace advocates to distinguish the processes and services in valuation of ecosystem services because "ecosystem services are specifically related to human value while processes and assets do not". Similarly, Costanza et al., (2014) illustrate that ecosystem services do not generate human well-being directly through natural capital. It is through the interaction of natural capital with the social capital (communities), human capital (people) and built capital (man-made environment). In general, built and human capitals (the economy) are embedded in the society which is embedded in the rest of nature. When nature contributes significantly to human welfare, it is a major contributor to the de facto economy (Costanza et al., 1997, 2014). However, the classification of ecosystem services is challenging both conceptually and technically. It is also urgently needed to facilitate the applications of the ideas in decision making (both policy and management) and (to some extent) in research. The task of classification is conceptually challenging because the idea of ecosystem services is essentially a 'boundary object': it helps to transmit and coordinate thinking between disciplines even though there is no commonly accepted or precise definition of the term. It is useful precisely because it is vague and open to different interpretations. As a result,

any common, agreed classification is difficult to achieve. Key definition all issues include:

- Whether ecosystem services are benefits or whether they are the contributions that ecosystem services make to well-being (via the benefit supported by a set of 'final' ecosystem services) (cf.Potschin and Haines-Young,2011).
- Whether ecosystem services are only those ecosystem service outputs that are dependent (to some extent) on living processes or whether they include pure abiotic outputs (e.g. wind and hydropower, salt, physical landscapes). The design of any classification system is technically challenging because (apart from the lack of common definitions) there are a range of purposes or applications that have to be considered which have different requirements in terms of the levels of thematic and spatial resolution needed. Moreover, different disciplinary groups bring different concepts and framings to the table, so that convergence of terminology (and any agreed classification) is difficult. Examples of issues include:
 - Whether ecosystem 'services' and ecosystem 'goods' are synonymous or whether we make a distinction between them. For example, the UKNEA (<http://uknea.unep-wcmc.org/>) argues that services are the final outputs and goods are the things that are valued in terms of the benefits they generate. Thus, for a forest ecosystem 'trees' are final service and timber one of the 'goods' that are produced and which can be valued alongside, say, other non-timber forest products such as the 'buffering capacity' of woodlands against avalanche.
 - How we treat ecosystem services from artificial or semi-natural systems. In their vision of the System of Environmental and Economic Accounts (SEEA,2012), cultivated crops in the field are not regarded as services—but products (goods); instead 'nutrients and natural feed for cultivated biological resources' in agro-ecosystems are proposed as final services.
 - The way we treat ecosystems services that include inputs from other types of capital (financial, manufactured, social, human etc.) is a major issue in the

design of any classification system; the way we assess or quantify the contributions that ecosystems make to human well-being is often unclear. Table1 provides an overview of the revised Common International Classification of Ecosystem Services (CICES) which has been designed to meet some of these challenges. The table also provides a comparison with the typologies used for the MA and TEEB. It is based on the recent document on the European working group on Mapping and Assessment of Ecosystem Services (MAES, 2014), but has been updated and reorganized so that the information to take account of their visions suggested for CICESV4.3. Although CICES was initially designed to support environmental accounting its hierarchical structure may also assist in mapping and assessment, and at different thematic and spatial scales.

The hierarchical structure allows studies that are undertaken at different thematic and spatial resolutions to be more easily compared. At present it only deals with services that are dependent on living processes in some way, but it can be extended to cover the various abiotic outputs from natural systems (e.g.wavepower) if required. However, we note the many arguments against this in terms of diverting attention away from the importance of living processes for sustaining human well-being. Table 2 summarizes the ecosystem services typology according to CICES and also offers a comparison with MA and TEEB.

Table 2: Ecosystem, service CICES and comparison with MA and TEEB

CICES for ecosystem service mapping and assessment					
CICES for ecosystem accounting					
Section	Division	Group	Class	MA	TEEB
Provisioning	Nutrition	Biomass	Cultivated crops	Food	Food
			Reared animals and their outputs		
			Wild plants, algae and their outputs		
			Wild animals and their outputs		
			Plants and algae from in-situ aquaculture		
			Animals from in-situ aquaculture		
		Water	Surface water for drinking	Water	Water
			Ground water for drinking		
	Materials	Biomass	Fibres and other materials from plants, algae and animals for direct use or processing	Fibre, Timber, Ornamental, Biochemical	Raw materials, medicinal resources
			Materials from plants, algae and animals for agricultural use		
			Genetic materials from all biota		
		Water	Surface water for non-drinking purposes	Genetic materials	Genetic materials
			Ground water for non-drinking purposes		
	Energy	Biomass-based energy sources	Plant-based resources		
			Animal-based resources		
		Mechanical energy	Animal-based energy		

CICES for ecosystem service mapping and assessment					
CICES for ecosystem accounting					
Section	Division	Group	Class	MA	TEEB
Regulation & Maintenance	Mediation of waste, toxics and other nuisances	Mediation by biota	Bio-remediation by micro-organisms, algae, plants, and animals	Water purification and water treatment, air quality regulation	Waste treatment (water purification), air quality regulation
			Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals		
		Mediation by ecosystems	Filtration/sequestration/storage/accumulation by ecosystems		
			Dilution by atmosphere, freshwater and marine ecosystems		
			Mediation of smell/noise/visual impacts		
	Mediation of flows	Mass flows	Mass stabilisation and control of erosion rates	Erosion regulation	Erosion prevention
			Buffering and attenuation of mass flows		
		Liquid flows	Hydrological cycle and water flow maintenance	Water regulation	Regulation of water flows, regulation of extreme events
			Flood protection		
	Maintenance of physical, chemical, biological conditions	Gaseous / air flows	Storm protection	Pollination	Pollination
			Ventilation and transpiration		
		Lifecycle maintenance, habitat and gene pool protection	Pollination and seed dispersal	Pest regulation	Biological control
			Maintaining nursery populations and habitats		
		Pest and disease control	Pest control	Disease regulation	Maintenance of soil fertility
			Disease control		
		Soil formation and composition	Weathering processes	Soil formation (supporting services)	
			Decomposition and fixing processes		
		Water conditions	Chemical condition of freshwaters		
			Chemical condition of salt waters		
	Atmospheric composition and climate regulation		Global climate regulation by reduction of greenhouse gas concentrations	Atmospheric regulation	
			Micro and regional climate regulation	Air quality regulation	

CICES for ecosystem service mapping and assessment					
CICES for ecosystem accounting				MA	TEEB
Section	Division	Group	Class		
Cultural	Physical and intellectual interactions with biota, ecosystems, and land-/seascapes [environmental settings]	Physical and experiential interactions	Experiential use of plants, animals and land-/seascapes in different environmental settings	Recreation and ecotourism	Recreation and tourism
			Physical use of land-/seascapes in different environmental settings		
		Intellectual and representative interactions	Scientific	Knowledge systems and educational values,	Inspiration for culture, art and design, aesthetic information
			Educational		
			Heritage, cultural		
			Entertainment		
	Spiritual, symbolic and other interactions with biota, ecosystems, and land-/seascapes [environmental settings]	Spiritual and/or emblematic	Aesthetic	Spiritual and religious values	Information and cognitive development
			Symbolic		
		Other cultural outputs	Sacred and/or religious		
			Existence		
			Bequest		

Apart from Non marketing services

- Air quality
- Climate regulation
- Water provisioning
- Waste treatment
- Erosion control
- Pollination
- Biodiversity habitat
- Nutrient cycling
- Disturbance prevention
- Aesthetics
- Recreation

In this study, the specific area of interest is the Northern Pindos. The Northern Pindos National Park was established in 2005 by the Common Ministerial Decision 23069 (ΦΕΚ 639/14-6-2005). It is located at the Northwestern part of Greece and administratively belongs to the Regional Sections of Ioannina and Grevena. It extends in an area of 1,969,741 m² and it is the largest terrestrial National Park in Greece. It includes the entire region of Zagori, the areas of Konitsa and Metsovo and the western part of Grevena. It geographically unifies the pre-existing National Forests of Pindos (Valia Kalda) and Vikos-Aoos, with their in-between geographical region. The creation of the Northern Pindos National Park after the integration of

these areas has as its main purpose the preservation, protection and enhancement of the natural and cultural heritage of the region.

The National Park includes the second-highest mountain of Greece: Smolikas (2.637 m), the impressive mountain ranges of Tymfi, Lygkos, Vasilitsa, Mitsikeli and others. Within the protected area lie the sources of the rivers of Voidomatis, Aoos and Venetikos and the tributaries of Arachthos: Bardas and Zagoritikos.

The most striking National Park features are its gorges and ravines. The most important ones are the Vikos Gorge and the Aoos Canyon in the region of Ioannina, the Portitsa gorge, Tsoyrgiaka and Mikrolivado canyons in the region of Grevena.

The high and craggy peaks create a bright and diverse terrain with a variety of habitats and species. The transitional ecosystems offer a unique landscape through the seasons of the year, for example the chromatic variations of the forest species of Mount Orliakas are considered unique in the country. The area of the National Park is home to many rare, endemic and endangered species comprising an exceptional biodiversity, which specifies the particular ecological value of the area.

Within the Northern Pindos National Park region, a land-use management system was developed that established a graded system of conservation zones. Four distinct zone areas have been identified, at two of which (*Zone I* and *Zone II*) applies a very high degree of protection, in order to preserve the ecosystem and the traditional mountain lifestyle. In particular, the three cores of the National Park are determined as **Nature Reserve Areas (Zone I)**, that is, Valia Calda, the Vikos Gorge and Aoos Canyon. These are the environmental hearts of the park and require the most effective protection of the existing natural environment with minimal human intervention. Around these areas, **the Natural Habitats and Species Conservation Zone (Zone II)** extends over four particular areas. Finally, beyond the National Park region, four particular areas have been determined as the **Peripheral Zone (Zone IV)**. The highest degree of protection applies in the **Nature Reserve Areas (Zone I)**, in which the main objective is the maintenance of the existing status of the physical environment and its effective protection in order to follow its natural evolution with minimal human intervention. Scientific researches, guided tours for visitors and eco-tourist programs have been designed to allow access to these areas, with the least environmental impact.

In **the Natural Habitats and Species Conservation Zones (Zone II)** the land uses are also restricted to preserve the natural environment. The sustainable management of these zones includes research activities and encouragement of traditional agriculture.

In the **main area of the National Park** the protection degree is milder. It constitutes the largest area of the National Park and includes several village lands where environmental and traditional mountain lifestyles are protected. The Park promotes the preservation of traditional activities, with maintenance of the environmental balance. Eco-tourism and education in this area is encouraged.

Finally, the areas outlying the National Park borders, but considered essential to the Park's ecosystem are included in four **Peripheral Zones (Zone IV)**. The Peripheral areas are buffers between the highly protected areas of the Park and the surrounding region. Land use restrictions are placed on activities that have a negative effect on the maintenance of the Park area in a natural state. The Peripheral areas overlap the range of protected species, such as the brown bear (*Ursus arctos*) and other wildlife. Sustainable growth and development of recreational activities are promoted, with a goal of restoring these buffer zone regions to a more natural, but economically sustainable state.

The Vikos-Aoos area extends in over a 3407 ha core area and 9538 ha buffer zone of broad-leaved and evergreen mixed forests. The landscape is a mosaic of gorge edge lookouts, forests, alpine lakes and rivers. Within this area, 253 plant species have been recorded, many of which are characterized as rare and 4 are endemic to the park (National Committee of Physical Planning and the Environment, 1982). A plethora of large mammals, such as the brown bear, for which Vikos-Aoos is one of the last European strongholds, wolf, lynx, roe deer, chamois, wild boar wild cat, otter, 100 bird species (Katsadorakis, 1985) as well as a variety of natural habitats and ecosystems rank Vikos-Aoos amongst the most valuable Greek parks for nature conservation (Duffey, 1982). Three communities are found within the buffer zone and another six are in close proximity to the park, whose economies are directly or indirectly related to, but also impinge on the park's biological systems and resources. At present the area is facing a decline in traditional activities of the primary production sector, in favour of trade and service sectors. Vikos-Aoos is the third

most visited park with an annual visitation of more than 90,000 persons per annum (Papageorgiou & Vakrou, 2001). The landscape character and relatively undeveloped setting of Vikos-Aoos favours a series of facilities for dispersed recreation. Other uses involve camping, kayaking and canoeing. Yet, significant tourist infrastructure development occurs in the communities close to the park. Today the interaction between man and nature in all parks has, to a great extent, been driven by the presence of tourists and recreationists and less by traditional activities of the primary sector. Having little history of working together with the park users and local communities or developing and planning park strategies as integral component to regional development, the focus of park management has been upon establishing prohibitive measures as regards conservation and offering small scale recreational amenities to facilitate on-site activities such as walking and picnicking. Visitors can obtain on-site information regarding the kind of activities that they are allowed to perform within the park from information signs posted at the entrances of each park. In addition, simple informative facilities including posts with information about the history and main geographical features are found in all parks whereas small thematic museums about local history and flora occur in Vikos-Aoos.

The cultural services category of the ecosystem services framework concerns the non-material benefits that society receives from ecosystems (e.g. cultural identity, recreation, and aesthetic, spiritual and religious benefits)' (Chapin, Kofinas & Folke, 2009), subsequently playing a significant role in human well-being (Milcu, et al., 2013). As many cultures attach spiritual and religious values to their environment, cultural services play an important role in the quality of life of certain groups of people. Another area of significance concerning cultural ecosystem services centres on their relationship to human health and well-being. According to Pröbstl-Haider (2015), 'for recovery from work as well as for recreation and relaxation, the presence and accessibility of a green environment such as forests, diverse landscapes, parks or gardens are now regarded as crucial', emphasising the connection between ecosystems and their beneficial effects on health and wellbeing. Furthermore, ecosystems have been shown to provide people with inspiration for art, folklore and national symbols, as well as provide a "sense of place" for people within a given

ecosystem, subsequently impacting the way in which humans both view and interact with their immediate environment (Millennium Ecosystem Assessment, 2003).

Due to the nature of this research topic, certain types of cultural services relating to the nature-based tourism sector should be specifically highlighted. Firstly, recreation and ecotourism are considered as a cultural ecosystem service because they allow people to spend their leisure time experiencing new cultures and differentiated (and aesthetically-pleasing) environments, a factor which has been observed in the Icelandic case. Another cultural service of interest, concerns the educational values that an ecosystem can provide. According to the Millennium Ecosystem Assessment (2009), 'ecosystems and their components and processes provide the basis for both formal and informal education in many societies', reflecting the potential of the nature-based tourism sector with regards to communicating environmental issues to tourists in Iceland. Papageorgiou (2005) conducted a study on the visitor's profile in Vikos Aios park. According to his study 59 % of the visitors were male while 41% were women 67% were of higher education. In addition, visitors valued highly the existing facilities like footpaths, kiosks and resting areas and at the same time declared that they wouldn't like development such as more lodgings, restaurants or coffee shops that might spoil the unique wilderness, suggesting that they mainly visit the area for the aesthetic value and for its recreational value.

1.2. Capitalization and sustainability of the ecosystem services targeted

The target services of the study are the cultural services related to tourism and recreation of Pindos National Park Area. Veritably, natural capital that benefits human well-being should be given adequate weight as well in the decision-making process (Costanza et al., 1997). Essentially, the valuation of ecosystem services should be focused on how to balance all the other assets to achieve a sustainable outcome.

Numerous studies underline the importance of immaterial benefits provided by ecosystems and especially by cultural landscapes, which are shaped by intimate human–nature interactions. However, due to methodological challenges, cultural ecosystem services are rarely fully considered in ecosystem services assessments.

During a study conducted in Eastern Germany, a spatially explicit participatory mapping of the complete range of cultural ecosystem services was performed and several disservices perceived by people living in a cultural landscape were recorded. The results stemmed from a combination of mapping exercises and structured interviews with 93 persons that were analyzed with statistical and GIS-based techniques. The results revealed that respondents relate diverse cultural services and multiple local-level sites to their individual well-being. Most importantly, aesthetic values, social relations and educational values were reported. Underlining the holistic nature of cultural ecosystem services, the results reveal bundles of services as well as particular patterns in the perception of these bundles for respondent groups with different socio-demographic backgrounds. Cultural services are not scattered randomly across a landscape, but rather follow specific patterns in terms of the intensity, richness and diversity of their provision. Resulting hot spots and cold spots of ecosystem services provision are related to landscape features and land cover forms. The conclusion is, that despite remaining methodological challenges, cultural services mapping assessments should be pushed ahead as indispensable elements in the management and protection of cultural landscapes. Spatially explicit information on cultural ecosystem services that incorporate the differentiated perceptions of local populations, provide a rich basis for the development of sustainable land management strategies. These could realign the agendas of biodiversity conservation and cultural heritage preservation, thereby fostering multi functionality.

We should mention here that Natura 2000 consists of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated respectively under the Habitats Directive and Birds Directive. The Habitats Directive includes Sites of Community Importance (SCIs) which upon the agreement of the European Commission become Special Areas of Conservation (SACs) to be designated for species other than birds, and for habitat types (e.g. particular types of forest, grasslands, wetlands, etc.). Together, SPAs and SACs form the Natura 2000 network of protected areas.

Natura 2000 sites count between 1.2 and 2.2 billion visitor days every year, generating additional revenue and regional income of EUR 50 to 85 billion [2]. EEA

REPORT NO 5/2012 [online]. cit. 2013-02-20, URL: (<http://www.eea.europa.eu/>).

This shows the importance of Natura areas as a tourist attraction. In general tourism is one of the most important, rapidly developing economic activities, especially since the last half of the 20th century (Fayos-Sola,1996 ; Koutsouris & Gaki, 1998). In Greece, there are 202 areas which have been registered as Special Protection Areas (SPAs) and 241 as Sites of Community Importance (SCIs). Areas in the two categories often overlap each other. These 443 zones form the Greek part of Natura 2000 and cover, roughly, 19% of Greece (Figure 1).



Figure 1: Natura 2000 areas in Greece

Their registration was finalized in 2010-2011. For some of the Natura 2000 areas one of the economic activity is tourism, which is influencing the local environment one way or the other which, if allowed to be vast and uncontrolled will certainly cause significant negative impacts on the natural and built environment. This raises

questions about the sustainability of the tourist product development process in the Natura 2000 areas.

All types of tourism can be sustainable, under some conditions, such as that they respect the local society and environment of the area they take place. This is especially the case for the alternative forms of tourism developed in ecological sensitive areas and in areas with important cultural monuments that should be preserved and protected. Furthermore,

The position at WTO is that all tourism activities, be they geared to holidays, business, conferences, congresses, or fairs, health, adventure or ecotourism itself, must be sustainable. This means that the planning and the development of tourism infrastructure, its subsequent operation and also its marketing should focus on environmental, social, cultural and economic sustainability criteria, so as to ensure that neither the natural environment, nor the socio-cultural fabric of the host communities will be impaired by the arrival of tourists; on the contrary, local communities should benefit from tourism, both economically and culturally. Sustainability implies that enterprises, as well as the communities in which they operate, have something to gain from tourism.

Every action plan that seeks to move away from conventional tourism and to apply new forms of tourism is welcome, since it is contributing to the area's sustainability. On the other hand, it is considered as too utopian to believe that the development of economically sustainable tourism activities will have absolutely no environmental impact. The pattern of tourism development has at least three dimensions:

- improvement in the environmental performance of enterprises in the tourism industry, and the imposition of limits to tourism growth (green tourism);
- the development of special interest forms of tourism through exploitation of the natural and cultural characteristics of the area, which means that the increase in added value per capita that is created remains within the host area (special interest tourism); and
- the development of forms of tourism that have a low environmental impact and at the same time contribute to the preservation and exploitation of cultural heritage and the maintenance of population and economic activities in remote areas (alternative tourism).

In this proposed scheme the effects of the socio-demographic system are not considered. Changing the conventional tourism model is not an easy task because it is based on strong market mechanisms. However, it is not impossible, especially if we consider the recent changes in tourists' preferences for vacations, the environmental awareness of consumers, and the development of environmentally friendly technologies. Tourism can be based on two criteria: first, the tourist performance per capita, which relates to the added value and the employment created per tourist, as well as the consumption of water and energy and the production of wastes per capita; and, secondly, the scale of the activity compared to the carrying capacity of the host area. Even if the performance per capita is improved, every area has its own environmental, social and economic limits that cannot be surpassed.

Yet, it is worthwhile for the national government to sufficiently fund the establishment and ongoing management of national parks in order to secure a broad range of benefits delivered by ecosystems. The ecosystem services provided by the protected areas are certainly higher than the investments in the long term. This significance of the ecosystem services should be kept in mind when developing management policies within the context of sustainable development.

2. Review and analysis

2.1. Typology of capitalization mechanisms for ecosystem services

An increasing amount of information is being collected on the ecological and socio-economic value of goods and services provided by natural and semi-natural ecosystems. However, much of this information appears scattered throughout a disciplinary academic literature, unpublished government agency reports and across the World Wide Web. In addition, data on ecosystem goods and services often appear at incompatible scales of analysis and is classified in different ways by different authors. In order to make comparative ecological economic analysis possible, a standardized framework for the comprehensive assessment of ecosystem functions, goods and services is needed. In response to this challenge, this paper presents a conceptual framework and typology for describing, classifying and valuing ecosystem functions, goods and services in a clear and consistent manner.

In the following analysis, a classification is given for the fullest possible range of 23 ecosystem functions which provide a much larger number of goods and services. In the second part of the paper, a checklist and matrix is provided, linking these ecosystem functions to the main ecological, socio-cultural and economic valuation methods. One of the tools for capitalization of ecosystem services is the Table 3 on ecosystem services and related markets.

Table 3: Ecosystem services and related markets

Ecosystem Service Category	Sub-category	Example Business and Exposure	Relevant Existing Ecosystem Market(s) ¹
Provisioning services	Food	Agricultural producer: primary production	Greenhouse Gas (GHG) emissions, hydrological systems, biodiversity
	Raw materials	Forestry and agricultural companies: primary production	GHG emissions, hydrological systems, biodiversity
	Water	Agricultural producer: water as input	Hydrological systems
	Medicinal resources	Pharmaceutical company: product	Biodiversity
	Genetic resources	Agricultural inputs: source for product	Biodiversity
Regulating services	Local climate and air quality	Utilities, miners, and industrial manufacturers: liable under air quality standards	GHG emissions, other air quality parameters such as Sulphur Oxides (SO _x) and Nitrogen Oxides (NO _x)
	Carbon sequestration and storage	Agricultural and forestry companies: license to operate	GHG emissions
	Moderation of extreme events	Real estate developer: flood risk Resource producers in prone areas (agriculture, forestry, and fisheries): operational risk Insurance industry: costs	GHG emissions, hydrological systems, biodiversity
	Waste-water treatment	Hydro power companies: regulation of flow Producers: water quality and availability for agriculture, forestry, and fisheries	Hydrological systems
	Erosion prevention and soil fertility	Producers: yield loss due to declining fertility and loss of topsoil	Hydrological systems
	Pollination	Producers: yield loss due to loss of pollinators	Biodiversity
	Biological control	Producers and intermediaries: yield loss due to new pests and diseases	Biodiversity
Cultural services	Tourism	Tourism companies: sea level rise; storm damage to resorts and transport systems; Retailers: loss of tourist-driven store traffic	GHG emissions, hydrological systems, biodiversity, habitats
	Recreation	Producers: loss of license to operate due to loss of recreational value	GHG emissions, hydrological systems, biodiversity

Tourism resources – elements of the natural and cultural - historical environment – have been capitalized in tourism from ancient times, even if we refer only to the spring waters or to the religious sites from Antiquity and the Middle Age, that were generating sightseer flows. The capitalization of the tourism resources and the development of tourism must be constitutional correlated with the general stipulation of the complex systematization of the territory, which ensures a harmonious development of all economic sectors and also a blend between the criteria of economical efficiency with the social ones.

An efficient method to establish the capitalization degree of the tourism potential implies comparing the existing attractions with tourism endowment and the intensity of demand. Taking in consideration the equipment and tourism circulation indicators, one can determine the capitalization degree.

In Pindos area there are more than 53 available accommodation sites, however there is a need for adequate accommodation of high standards in the area and also small establishments should be developed in other areas to support mild tourism development

In the area there are also important trails like the E4 and E6 big European trails that start from Finland and end in Greece (E6). One more famous trail is the Epirus trail with 363 klm mapped. In addition, there are several activities especially in Vikos Aaos with rafting, mountain bike, canoe kayak, parashot base jump and other activities developed. Papigo and Zagoroxoria are also well known as hot spots for tourism. However, expected results from the capitalisation of the Pindos tourist product are:

- Increase in tourist visits and stays overnight
- Extension of the tourist season
- Creating new jobs
- Increasing local peoples' income
- Strengthening extroversion and business know-how

In conclusion, protected areas are vital reserves of our shared natural heritage. They are dedicated to the preservation of species, ecosystems and landscapes. Moreover, they allow well-managed access, understanding and enjoyment. In a highly engineered world they are our link to nature as it is – unaffected, unpredictable, following its own laws – the link to our origin and to the great context of life. Connecting people, place and nature is at the heart of protected area managements. Saving our natural inheritance to future generations can only succeed by understanding its meaning to us. A sustainable nature tourism – respecting the conservation objectives – within and around protected areas can be an important element of regional economies. Furthermore it supports conservation of nature as this is the focus of the tourism in the area.

2.2. Potential actions, plans, interventions, works, mechanisms etc ensuring sustainability of the ecosystem services targeted

Given both its economic and geographic scope, tourism is arguably the world's largest industry (WTO, 2005b). By the late 1990s, the tourism industry reaped annual benefits of \$5.3 trillion. More than just revenues gleaned from leading a guided tour, tourism revenues include plane tickets, car rentals, and accommodations. In addition, tourism has become the world's top employer, generating nearly 11 percent of all jobs. With expectations for future growth, the World Tourism Organization predicts that tourism will increase by 50 percent between 1990 and 2010. Tourism is any activity that carries a person to places outside his/her usual environment for recreation, business, or leisure (WTO, 2005a). As early as the 1980s, tourists cognizant of the industry's potential for ecological disruption and destruction began to demand ecologically conscious tourism options (Honey, 2002). As demand from this small segment grew, "nature," "adventure," "eco," and "sustainable" tourism options emerged. Most tourist ventures develop tours in response to market demand, mixing and matching activities as appropriate. Recently, the World Tourism Organization, a United Nations (UN) agency, launched a sustainable tourism initiative advocating a new form of tourism that balances the environmental, economic, and socio-cultural features of tourism development by maintaining environmental resources, the socio-cultural livelihoods of host communities, and providing benefits to all stakeholders (WTO, 2004). Sustainable tourism connotes a mixture of nature, adventure, and ecotourism initiatives that strive to achieve the above-stated goals. Nature, adventure, and ecotourism frequently overlap in practice, despite seemingly static definitions in academic literature. Nature tourism includes "travel to unspoiled places to experience and enjoy nature". Adventure tourism usually includes participation in high-risk activities that require physical endurance. Ecotourism, hailed by many as responsible ecological tourism, is travel to natural areas that strives to be low impact, educate the traveler, and provide direct funds for conservation, as well as benefit the economic development and political empowerment of local communities. Finally, ecotourism aims to foster respect for local culture, human rights, and international

labor agreements. While many advocates hail sustainable tourism as a panacea for biodiversity conservation (Rainforest Alliance Sustainable Tourism Initiative, 2005; United Nations Environment Program Sustainable Tourism Program, 2002), others question this frustratingly amorphous buzzword, which signifies different practices in diverse locations. Proponents recognize sustainable tourism as one form of sustainable development. On the other hand, critics emphasize the ecological, social, and economic impacts of unregulated “sustainable” tourism. Many “eco” and “sustainable” tours do not adhere to guidelines promoting sustainable environmental, social, and economic benefits. Unregulated tourism can cause profit leakage to foreign investors, an increase in local prices, increased crime, pollution, landscape degradation, and the depletion of local natural resources, particularly water resources.

Among the major interactions between humans and nature, tourism has received much attention in recent years by park managers and researchers alike. The number of people visiting national parks and other protected areas is growing rapidly; annual recreation visits to the US national park system alone exceeded 400 million in 1989. Overcrowding and misuse of natural resources produce impacts both in the physical as well as in the cultural environment; unfortunately, the actual interface between tourism and conservation has often been one of coexistence moving towards conflict. There are several reasons for this inadequate management and the explosive growth of tourism but are largely responsible. The general interest in nature-based experiences is reflected in the increasing demand and increasing pressure on the resource. The creation of national parks is now the most universally adopted means of conserving a natural ecosystem and/or relevant cultural heritage for a broad range of human values. The IVth World Congress on National Parks and Protected Areas defined national parks as natural areas to protect the ecological integrity of ecosystems and provide a foundation for spiritual, scientific, educational recreational, and visitor opportunities. At the most fundamental level, park authorities manage national parks in order to establish and preserve the ecological integrity of sensitive natural ecosystems as well as to care for the demand of recreational activities in a natural setting, conduct research, and establish parks as places for environmental education. Management strategies discussed in national

park literature deal with the practical difficulty of balancing conservation and recreational use. Three management approaches are suggested in order to tackle the pressures caused by tourism: activity-based management, experience-based management, and benefits-based management. Several researchers also have developed management regimes by implementing the concept of carrying capacity in a nature reserve, which seeks to maximize the recreational product and minimize impacts on the viability of wildlife and habitat. Ever since the early national park years, conservation efforts in national park master plans have aimed to minimize impacts on the resource with the aid of tailored management responses, mainly by issuing special operation regulations to restrict and control human activities in order to ensure that they will not degrade the function of biological systems. In light of growing pressures, the increasing mandate for greater efficiency in conservation of natural resources as well as the potential of environmental education for wildlife conservation calls for reorientation of park management with greater emphasis on efforts that aim to enhance knowledge in the short run and prompt change of behavior of visitors in the long run. Several authors have stressed the value of management strategies that aim to incorporate learning and facilitate attitude and behavior change to fulfill conservation goals and promote an enjoyable tourist experience. There is an urgent need to integrate interpretative facilities into informal recreation in order to provide an enjoyable and rewarding educational experience for visitors and enhance their understanding and appreciation of the site, while that establishing environmental facilities in parks ameliorates the efficiency of carrying capacity-based management of reserves. The value of learning is linked with its potential to promote behavioral change as certified by many authors who have identified a positive relationship between the cognitive domain of environmental education and positive environmental behaviour (UNESCO 1977). The purpose of conservation is determined by a combined harmonization of traditional restrictive and regulatory approaches with a behavior-oriented approach for the park user. It is believed that aside from direct benefits to visitor recreational product, an environmentally responsible approach could generate direct and indirect benefits to the viability of natural systems and threatened species in national parks. Raising the level of knowledge in this context constitutes an obvious outcome of a behavioral

management regime. Thus, the study represents an initial effort to assess the efficiency of regulatory- and behavior-based strategies by measuring the level of knowledge, in a case study undertaken in the Vikos-Aoos national park, in two categories of interest. The first, is a set of rules and restrictions for certain kinds of activities as they are determined by the park's operation regulation, the cornerstone of a regulatory management strategy. A significant component of the success of regulatory management lies largely on enforcement efficiency, but knowledge of rules and regulations is a prerequisite of appropriate behavior. This can provide essential information for park administrators to make decisions on appropriate improvements in the content of information provided and on communication instruments. The second is that knowledge of basic national park concepts, facts, and generalizations provides a deeper insight and can be used to provide an evaluation of how effective the various sources of knowledge have been in educating the public about parks and promoting a sensitive citizenry. The level of knowledge as it relates to similarities and differences across two divergent categories of park users has also been examined: those who live in close proximity to the park and those who travel long distances to reach the park. One conclusion is that the greater familiarity of users belonging to the first group with the park management development procedures and repercussions from the action taken through local environmental groups and the efforts of the park authority has raised the overall awareness of this group. From the early creation of national parks, the formal purposes of national parks have evolved to contain the development of ecological science, include recreation interests, and more recently to sustain the livelihood of local communities and serve as places for environmental education.

So far, the fulfillment of park purposes, mainly conservation and recreation by park authorities, has been achieved primarily through the realization of regulatory and restrictive management practices. Such practices are prevalent in natural situations and are the traditional and most common methods of controlling nature–visitor interactions.

Particular rules and regulations should be used to restrict visitor actions, access, times, and numbers and should be posted on signs and notices including in written material often combined with fines and other financial disincentives. There should

also be foreseen the enforcement of the rules by park rangers or specialized wardens or other agents of the park authority. Such management efforts are opted for mitigating the human-driven disturbances to wildlife and natural resource, and frequently occurred at the expense of local communities and recreationists. In many cases, the growing number of visitors in parks and the increasing number of opportunities to interact with wildlife often result in a proliferation of visitor restrictions. It has been reported that these restrictions often reduce the freedom of visitors and the overall enjoyment of the experience (Hatten and Hatten 1988). An expression of poor performance of such strategies is often seen in discomfort of park visitors and conflicts between local communities and park authorities. The significance of parks for educating park users and the potential of environmental knowledge in general as a conservation tool is well recognized by park administrators and national governments throughout the world and has been highlighted by several authors. Enhancing education about parks and implementing educational policies were the central themes in the World Congress on National Parks and Protected Areas held in Caracas in 1992 thus showing its importance. In both the developed and developing world, conservation education programs in and around reserves are a critical and necessary step towards securing their protection. Education programs developed for a nature reserve enhanced the education of visitors and locals whilst benefitting the reserve. Several authors have recognized the value of visitor education to reduce the incidences of inappropriate visitor behavior and minimize environmental impacts on natural ecosystems. Considering the human attitude dimension in environmental philology, it was quite early realized that the solutions to environmental problems do not lie in traditional technological approaches but rather in the alteration of human behavior. Conservation education has been suggested as a labor-intensive but cost-effective means of effecting behavioral changes. Moreover, the significance of behavior change to protect natural resources was verified in the IVth World Park Congress in the form of a commendation stating that “many people should modify their styles of living and the world community must adopt new and equitable styles of development, based on the care and sustainable use of the environment, and the safeguarding of global life-supporting systems”. A significant management component in the field of

ecotourism is to encourage ecotourists to change from a passive role, where their recreation is simply based on the natural environment, to a more active role where their activities actually contribute to the health and viability of the environment. Enhancing environmental education, on the other hand, although a clear-cut goal in management plans, in most cases has not been considered by park authorities as an instrument to achieve conservation purposes and its potential has not been linked directly with conservation. Most of the difficulties of utilizing education as a conservation mechanism lie in the time-consuming nature of the investment and inadequate education infrastructure in parks to meet the needs and expectations of visitors. The lack of educational facilities and resources in many tropical protected areas was a source of frustration to visitors and managers alike. Beckmann (1988) reported that the success of education as a management strategy in tourist–nature interaction strategies is impeded by inherent difficulties in planning and implementing an effective educational program for wildlife. Yet, it has been argued that education, as a critical conservation tool, provides only short-term solutions unless subsequent costly incentive packages are provided (Western and others 1989). Based on the significance of education as a conservation tool, as certified by various researchers cited in this study, it is argued here that a park management framework for conservation should incorporate visitor behavioral orientation in conjunction with regulatory strategies. The emphasis in this framework will be placed on educational activity aiming to confer meaning to nature, enhance knowledge of visitors in the short run, and modify visitor behavior in the long run. In other words, the efficiency of a set restrictions and regulations could be improved by appropriate information dissemination procedures, which will intend to stimulate environmentally responsible behavior of the park users. Thus, the two management approaches cannot be separated from each other but rather operate in a mutually beneficially manner. Education tools as important instruments to reduce need for regulation and enforcement of park operation regulations or increase the efficiency of these regulations. However, a change in park users' behavior could benefit the ecological integrity of systems not only directly through responsible behavior but also indirectly through, for example, funding research projects. One of the difficulties in the above management framework is the absence of absolute measurable

conditions to assess the efficiency of a behavioral management regime. This is likely related to difficulties in undertaking research in a natural setting and in determining, for example, the incidence of visitor change. There appears, therefore, to be a case for assessing the effectiveness of the combined management framework. In order to test the effectiveness of regulatory and behavioral management strategies, one must determine the desired outcomes of such strategies and how those outcomes can be measured. The level of perception of park visitors with respect to conceptual, administrative, and functioning issues pertaining to national parks, comprises an obvious outcome for a behavioral based strategy. The level of park related knowledge also can be used as an intermediate measure of the content of information that visitors have acquired onsite or elsewhere that eventually will lead in the desired change in park user behavior. Learning has been used as an indication of the success of behavior-based management strategies. In a similar manner, a preliminary assessment of the efficiency of a regulatory management strategy could be produced by measuring the extent of visitor awareness of certain activities that are permitted within a national park. However, knowledge of the operation regulations does not necessarily imply compliance of behavior; for example, it is quite possible for visitors to be aware that lighting any fire source is prohibited but nevertheless have a barbecue. Environmental knowledge has been identified as crucial in building an environmentally aware society and stimulating positive values and attitudes among community members. A measure of the level of knowledge also has implications for efforts of park authorities in raising knowledge about parks.

The area has great attractiveness showing enhanced possibilities and conditions for qualitative upgrading and enriching of the tourist product with special forms (congress, exhibition, historical-religious routes, traditional crafts - handicraft, silversmithing, athletic - rowing).

Mountainous tourist areas - Metsovo and Zagorohoria and in General Pindos area include areas of selective tourism of special interests, medium to high level, mostly domestic tourism. Tourist resources: high quality and high sensitivity of natural and cultural, international and national importance, with current protection status. The attractiveness of the area is great in terms of natural and cultural resources. Also, the area possesses unique possibilities and trends like the development of specific

forms of tourism (mountain, ecological, ski, special interests, agrotourism). For the sustainable development of the touristic product it is suggested to follow a mixture of control and regulation of the tourist trends having in mind the sustainability of the viability of the resources and the limitation of the development having as criteria the ecology and sustainability of the area. In addition, the model should include the ecology model for the cores and the immediate surrounding area of the natural resources of great importance and sensitivity (national parks and surrounding area). And the managing model in the rest of the region, with emphasis on maintaining and enhancing the high quality of services offered, as well as regulating and mitigating the pressures of peasants (Papigo, Monodendri) and sectoral (traffic congestion of visitor-day excursionists).

The protected area of Northern Pindos is one of the most important areas at both national and European levels. The Northern Pindos National Park Management Agency is the vigilant protection and management of the area and its peripheral zones with the goal of promoting ecologic, aesthetic, cultural and local values in a sustainable development model in harmony with the human presence in this area of unparalleled beauty. The agency plays also a crucial role in educational activities for the public and schools with Information Centers playing key role. The information center has also developed an environmental information/awareness-raising program for students aiming to educate and install values of environmental and cultural consciousness. The presence of student activity in the area of the National Park strengthens the role of the protected area and its infrastructure and contributes to raising the level of student awareness, as well as that of their siblings and friends. The Information Centers offer special presentations to students that visit the National Park and organize Environment Interpretation Trips which are designed by the Management Agency. There are also other environmental agencies in the area offering educational programs. One such organization offers an environmental Education program developed as a response to the significant environmental issues that our planet is currently facing. Environmental Education is approached as a tool for the protection and preservation of our natural habitat. By promoting education and awareness around environmental issues, the program aims at contributing towards the protection of the environment and the preservation of our natural habitat.

Furthermore, the model of sustainable development should also focus on qualitative improvement and maintenance of quality, development of technical, technical and technological - technological support infrastructure. We should stretch here the importance of the area for its high quality and sensitivity of natural and cultural resources of national importance.

2.3. Policies for capitalization of the ecosystem services targeted at global, EU, BalkanMed and national level (i.e. regulative services, cultural services)

The natural world, its biodiversity and its constituent ecosystems are critically important to human well-being and economic prosperity but are consistently undervalued in conventional economic analyses and decision-making (UK and NEA 2011). Recently, several global, regional and national initiatives have been set up in order to safeguard biodiversity and the services that ecosystems provide through ecosystem assessments (Schröter et al., 2016). The EU Biodiversity Strategy to 2020 aims, under its Target 2, to maintain and enhance ecosystem services (ES) in Europe. Action 5 of the strategy requires all Member States to map and assess the state of ecosystems and their services in their national territories. The working group on Mapping and Assessment of Ecosystems and their Services (MAES) has been established to coordinate and oversee the activities under Action 5. A methodological framework has been developed in order to ensure the consistency of the implemented approaches (Maes et al. 2013).

Within the emerging field of ecosystem services policy, five trends appear to be underway:

1. National governments around the world are exploring expansion of gross domestic product (GDP) measures to include natural capital, which would draw in ecosystem services measures. Specifically, during the June, 2012 Rio+20 conference, the Natural Capital Declaration was issued. By the end of year, 41 financial institutions and 23 NGOs became signatories. While numerous efforts are in early stages, a World Bank report documents 24 nations that are deploying some form of natural capital accounting in economic decision-making processes. Advocates assert

that this approach provides policy makers with more accurate information about national wealth. This work is synergistic with that of the 11 countries engaged with the World Bank's Wealth Accounting and the Valuation of Ecosystem Services (WAVES) global partnership focused on "ensuring that the national accounts used to measure and plan for economic growth include the value of natural resources." The effort includes representatives from the governments of Australia, Botswana, Canada, Colombia, Costa Rica, France, Japan, Madagascar, Norway, the Philippines, and the U.K.

2. Public-sector exploration of ecosystem services valuation is on the rise.

Initiatives focused on the economic valuation of ecosystem services are growing, as is illustrated by: "The Economics of Ecosystems and Biodiversity (TEEB) reports which were issued in 2010 and highlighted both the public- and private-sector imperative to begin considering ecological factors within national as well as corporate accounting calculations. It was developed in response to a German government proposal as part of the Potsdam Initiative for Biological Diversity. » In 2011, the European Environment Agency (EEA) issued a new framework for ecosystem capital accounting that highlights interactions between ecosystem services and the economy." Starting in 2010, the U.K. government began building on an action plan that lays out a strategic approach to embed ecosystem services more fully into policy-related decision-making. Recent efforts propose a framework for payments for ecosystem services (PES) and document a baseline assessment of ecosystem services. Specifically, the UK National Ecosystem Assessment was published in 2011, which was the first comprehensive assessment of the state of, and trends associated with, the UK ecosystems and its services as well as benefits to the economy and human wellbeing. The UK government followed this report with the Natural Environment White Paper published in June, 2011. One high level commitment from this white paper is the creation of the Natural Capital Committee to advise government on the state of English natural capital. The first state of natural capital report is due to be published in early 2013. Finally, the Office for National Statistics (ONS) and Defra published its roadmap on natural capital accounting for moving forward work on these issues.

3. Governments around the world are showing interest in attracting investment in ecosystem services, such as through PES and eco-compensation mechanisms.

In Asia, China and Vietnam are exploring eco-compensation and PES, respectively. Local governments in China have been considering various approaches for eco-compensation, such as transferring funds from the central government to maintain public forests, placing taxes and fees on mineral resources, and establishing payment mechanisms on upstream parties within watersheds. Two reports released in 2011 by the Asian Development Bank focus on institutional challenges and sources of finance for these initiatives. Even earlier, in 2009, Vietnam passed Decision 380, the pilot policy for developing a legal framework and national policy on payment for its forest environmental services. In 2010, Vietnam issued Decree 99/ND-CP focused on Payment for Forest Environmental Services, with implementation across all forests in the country. In Latin America, the nations of Brazil, Costa Rica, and Peru continue to explore financial incentives for investing in the restoration and maintenance of ecosystem services. In 2012, the Peruvian Ministry of Environment and NGO Forest Trends launched the Watershed Services Incubator to help Peruvian cities develop financing mechanisms for watershed protection. Their intention is to create a watershed-services investment approach that can be applied in other countries. In Brazil, the states of Acre and Amazonas have passed laws to establish a legal framework for measuring and valuing ecosystem services so that they can implement PES programs.

In Europe, Spain released the first draft of its forest action plan in 2011, with links to PES. In the U.K., a team commissioned by the Department for Environment, Food, and Rural Affairs (Defra) developed a draft “Best Practice Guide for PES” that was released in late 2012. Defra is planning to publish jointly the Best Practice Guide for PES and an Action Plan for PES in spring 2013.

It is noteworthy that some of these financial transfers from the central government for maintaining forests are not new, and indeed have been a core element of financing for biodiversity and ecosystem services traditionally. Yet, the distinction is that a growing number of players are exploring the idea of financing to cover the cost of managing ecosystem services (or capturing user fees from beneficiaries of the

services). The most accurate reading of these initiatives is not that they are about voluntary investments as a public good, but rather a new form of regulation to drive investment in natural resource flows. For this reason, the proliferation of public sector activity in this area of PES and eco-compensation is worthy for following closely.

4. Public sector-funded research on ecosystem services is on the rise.

Europe, the United States, and China continue to explore a wide array of government-supported research and voluntary initiatives related to ecosystem services, despite the absence of specific, targeted policies. For example, in China—where already strained natural-resources face increasing pressure—the government has initiated academic research on ecosystem services assessments. This research will likely inform the analytical approaches used in crafting eco-compensation mechanisms and, perhaps ultimately, broader policies. Public-sector research on ecosystem services is being shared in a growing number of well-attended academic conferences. In addition, ecosystem services sessions are increasingly included at other relevant conferences, such as those of the International Association of Impact Assessment (IAIA) and the Society of Environmental Toxicology and Chemistry (SETAC).

5. Engagement between the private and public sectors on ecosystem services is limited, but it has grown each year.

Despite the public sector's wide and expanding set of exploratory activities on ecosystem services, relatively few companies are actively engaged around this issue. While more companies than ever before flag ecosystem services as an issue that they are tracking, few have corporate policies and/or personnel and budgets allocated to managing their ecosystem services impacts and dependencies. The Quiet (R)Evolution in Expectations of Corporate Environmental Performance.”) Yet, private-sector activity may be on the rise, as indicated by: The U.K.'s launch of the Ecosystem Markets Task Force, a business-led initiative that brings together U.K. companies to look for opportunities to “drive green growth,” including through markets that value and protect the environment. It is anticipated further private-

sector engagement with ecosystem services following from the growing number of training initiatives that are focused on the private sector. For example, current training initiatives include: the World Business Council on Sustainable Development's (WBCSD) Business Ecosystems Training (BET), the UN Environment Programme and Development Programme (UNEP-UNDP) and other partners' training on "Valuing and Mainstreaming of Biodiversity and Ecosystem Services into Development Planning," and the Equator Banks' training for member-company analysts, which is driven by changes in due-diligence protocols that now explicitly include ecosystem services.

Pathways Forward

Collaboration between the public and private sectors will likely be a key component in accelerating the uptake of ecosystem services concepts and applications. Private-sector decision makers will need to understand ecosystem services concepts and the state of emerging best practice for assessing ecosystem services impacts and dependencies. Public-sector decision makers will need to understand the range of corporate processes, protocols, and other approaches that are currently in place to measure and manage environmental and social impacts. Some of these processes are regulated, but many are voluntary and have emerged from corporate history and culture, as well as industry best practice. Ultimately, the private sector's implementation of approaches to measure and address ecosystem services impacts and dependencies will be contingent upon identifying the differences between current corporate processes and what is needed to integrate ecosystem services approaches. On a practical level, to adopt ecosystem services metrics, analytical tools, and management approaches, the private sector must adapt current processes and possibly develop new ones. Given the wide variety of ecosystems around the world, the details of this work may need to be calibrated for specific contexts and may be affected by data availability. Effective collaboration between public and private sectors on how to operationalize and integrate ecosystem services concepts—within both public- and private-sector measurement and decision-making processes—would likely move the domain forward and accelerate adoption. We hope that this report will offer both private and public sector representatives with

the rationale to engage with ecosystem services more fully, as the trends for uptake seem to warrant.

In the Balkan peninsula many countries have encouraged the development of international tourism through direct and indirect forms of support. At the national level, the development of international tourism is within the ministries and state agencies for tourism. In general, these institutions are engaged in performing activities such as: control and regulation of tourism sector, collecting relevant sector information, preparation of national strategy for tourism development, developing a national tourism advertising campaign and more. National tourism organizations are present in more than 100 countries. WTO has audited the budget of 109 such organizations and it has defined the agencies and its subsidiaries as follows (Jeffries, 2001): a) The National Agency for tourism is defined as: a Central administrative body with administrative responsibility for tourism at the highest level i.e. central management authority with a power for direct intervention in the tourism sector; and all administrative authorities who have the power to make interventions in the tourism sector. b) Other governmental or administrative bodies of lower rank. An example is the National Tourism Organization, which is defined as: an autonomous governmental body, with semi-public or private status, established or recognized by the state as an authority having jurisdiction at the national level to promote, and in some cases marketing the tourism industry. The term "tourism policy" is representing the conscious activity of the state, or society in the field of tourism (Ackovski and Ackovska, 2003). Primary task of this policy is to undertake measures and activities that will be of crucial importance for the initiation of relevant factors responsible for tourism development in order to increase the tourist trade and consumption and to improve its structure and quality. In more specific terms, tourism policy fulfills the following functions (Goeldner and Ritchie, 2009): It defines the rules of the game — the terms under which tourism operators must function; It sets out activities and behaviors that are acceptable for visitors; It provides a common direction and guidance for all tourism stakeholders within a destination; It facilitates consensus around specific strategies and objectives for a given destination; It provides a framework for public/private discussions on the role and contributions of the tourism sector to the economy and to society in general; and it

allows tourism to interface more effectively with other sectors of the economy. Tourism policy has direct and indirect holders or executors. Direct holders and operators of tourism policy are: Representatives of government bodies at all levels (assemblies, parliaments, individual councils, institutions, commissions, etc.). The executive administration (government) at all levels (secretaries, tourism ministries, committees for Hospitality and Tourism, the main offices of hospitality and tourism at national, regional, municipal, city and a similar level). Indirect holders and executors of tourism policy are: Special bodies outside the public administration (municipalities and chambers of special business associations); Social organizations in the field of hospitality and tourism (tourism associations at all levels, tourist bureaus); Local communities; and Gathering and other commercial and non-commercial organizations in the tourism industry that directly or indirectly participate in meeting the tourist needs. For the realization of the objectives of tourism policy various measures (instruments and resources) are applied. In general, all instruments of tourism policy can be divided into four groups: Legal regulations which mainly include: constitutional provisions, laws, bans, permits, decisions, orders, etc.; Administrative instruments which mainly include: taxes, duties, fees, contributions, loans and other public revenues and public subsidies (compensation, contributions, premiums, guarantees, regression, etc.); Economic instruments mainly including: plans, programs, resolutions, funds, loans, bonds, money, rates and prices, etc.; and Contracts and agreements. Besides creating tourism policy, tourism is a factor that affects the formation of public policies in other areas, such as urban planning (Dredge and Jenkins, 2011).

National tourism development strategies and tourism products of Balkan countries

One of the instruments of tourism policy is the development of strategies for tourism development. Managing the development of individual companies, industries or sectors at national, regional and destination level, for which often are produced special programs and development solutions that are called strategies (Budinoski, 2009). The term strategy is used since ancient times in connection with knowledge of the generals. Within the last forty years this term is used in the

economy and specifically in tourism and hospitality. Nowadays, the strategy is mandatory and includes system management solutions which determine the prospects for development forms and methods of its action, the allocation of resources for the purpose of achieving certain goals, etc. In the Balkan peninsula all countries have developed and adopted national strategies for the development of tourism. These strategies are usually made for a period of several years (4 to 6), but in the case of Greece, Communication strategy is created for two years. In all strategies discussed, the vision of the level and the development of tourism in the future is included. Most of the strategies are made by ministries and experts in the field of tourism as well as education and NGOs. Strategy for tourism development in Croatia is the latest, prepared in 2013, and the strategy for tourism development of Romania has the longest duration i.e. until 2026. Tourism products, through which Balkan countries, with its national strategies for the development of tourism, dedicate special importance are the following:

Marine tourism includes activities such as swimming, sunbathing, water sports and more. With regards to Balkan countries with a sea shore, the longest coastline of 15,000 km belongs to Greece, followed by Croatia with 5.790 km of coastline. The smallest coastlines of approximately 20 km belongs to Bosnia, and Slovenia with 32 km. The length of Greece and Croatia coast lines is derived from the large number of islands (Bramwell, 2004). A developed tourist infrastructure is set in motion in the coastal regions of the Balkan Peninsula;

Mountain tourism includes winter sports, active holidays, cycling etc. Mountain tourism developed by the countries of the Balkan Peninsula, is explained by the large number of mountains, of which the most important are: Dinaric Mountains, Shar Planina, Pindos, Stara Planina, Rhodope, etc. The highest peaks of the Balkans are Musala in the Rila mountain 2925 meters above sea level, then Mitikas top of Mount Olympus and the 2,917 m peak of Mount Pirin, Vihren with 2914 m above sea level. There are numerous ski resorts located in these mountains.

Cultural tourism includes visits to cultural and historic sites, attendance at events and festivals or visiting museums. The rich cultural and historical heritage of the Balkan countries is a great opportunity to develop this kind of tourism. Urban centers provide an opportunity to develop this kind of tourism;

Business tourism and conference tourism which cover journeys arising directly because of work responsibilities or indirectly in carrying out activities related to work. Also, this form of tourism includes travel for corporate or organizational meetings, conventions, congresses and incentives trips (used by companies as a means to reward their best employees). Larger cities and economic centers of the Balkans subject to this form of tourism;

Educational tourism: The main objective of the tourist is acquiring new knowledge about the culture or history of other countries or cities. It is a trending type of tourism in many world regions, particularly in Europe. Educational tourism by itself is one of the trends that have higher growth in recent years. Despite the concept of travel for education and learning is a complicated area to delimit tourists are beginning to give more importance to new ways for discovering tourist destinations, and so the possibilities of learning grow significantly. On certain occasions, the learning activities at the destination are performed as annexed to the travel aim, but other times, the purpose of the trip is the learning itself. The most traditional way to know any city is through brochures provided by the Tourism and Information Office. In this way these offices can foster a more attractive way to learn about the different aspects of the city. Other approaches include traditional city books and multimedia DVD videos offering very limited user interaction possibilities. Augmented and Virtual Reality technologies can be used to improve the user experience a step further in the learning process. Nowadays, the first one is used mainly while the visitor is in the travel destination. More and more AR mobile applications are available to get additional information from historical places. These applications usually use the mobile devices GPS signal information to show augmented reality layers containing text, pictures, videos or audio explanations of a place. While AR is a very convenient approach when the visitor has travelled to a place, VR solutions are preferred when the user is far away, may be sitting in front of a display at a museum. VR enables the possibility of not only visiting and knowing places nearby, but also to visit other cities and historical spaces even from the users' homes. This approach offers also a great opportunity to people who cannot travel to a destination for different reasons such as illness, old age or high travel costs among others. Using a low-cost system as the one described above, these individuals could

experience travelling and educational tourism learning even from their home, using a game console or a PC together with proper visualization and interaction devices. The travel market aimed at learning a foreign language is a remarkable example of this type of tourism. This segment is steadily growing, especially in those destinations that can offer a language that is widely used, in an international level. While the current revenues of language schools are only 15 million euros, it is estimated that there is a potential market of 375 million people who want to travel to learn a language, especially if this experience is combined with other activities that are based on the local culture

Rural tourism involves visiting rural areas. Local gastronomy, traditional crafts, hospitality and specific architecture of the villages offer good prospects for development of rural tourism in the Balkans. The biggest part of the Balkan countries can be classified as rural, providing the ground for this type of tourism to develop during the last two decades.

Health and spa tourism which includes the use of various health services, treatments to improve the health, stay spas, using various massage techniques and more. Due to lower the costs of health services and the availability of thermal mineral waters, most of the Balkan countries have successfully developed this kind of tourism. Besides from the most common tourist products, Balkan countries additionally create and develop other types of tourism such as: sports, golf, active, eco, hunting, religious, wine, lake, river, etc.

2.4. Links among conservation drivers, pressures, ecosystem services and economic importance

Biological diversity (biodiversity) refers to the total sum of biotic variation, ranging from genetic level, to species level and on to ecosystem level. The concept includes diversity within and between species, as well as the diversity of ecosystems. The extent or quantity of diversity can be expressed in terms of the size of a population, the abundance of different species, as well as the size of an ecosystem (area) and the number of ecosystems in a given area. The integrity or quality of biodiversity can be expressed in terms of the extent of diversity at the genetic level, and resilience at

the species and ecosystem level (Martens, Rotmans, & de Groot, 2003). Biodiversity is therefore integral to natural and cultural dimensions of heritage. Furthermore, the five principal pressures directly driving biodiversity loss – habitat change, overexploitation, pollution, invasive alien species and climate change – are all factors to which tourism is a significant contributor (German Federal Agency for Nature Conservation, 1997; Gossling, 2002; Gossling & Hall, 2006; Hall, 2006, 2010a, in press a), and ‘are either constant or increasing in intensity. The ecological footprint of humanity exceeds the biological capacity of the Earth by a wider margin than at the time the 2010 target was agreed’ (Secretariat of the Convention on Biological Diversity, 2010, p. 9). The extinction of species is a natural process (Lande, 1998). However, species, genetic, and ecosystem loss has accelerated as a result of human activity (Secretariat of the Convention on Biological Diversity, 2010). Although the exact rate of biodiversity loss is disputed (Purvis & Hector, 2000), there is no doubt that human domination of the natural environment has led to a decline in biodiversity at all levels with an acceleration in the rate of species extinction in recent years. The current speed of species extinction through human intervention is estimated to be approximately 100–1000 times faster than the natural speed of extinction (Martens et al., 2003).

Six main reasons for conserving biodiversity can be identified (e.g. Callicott, 1990; Soule, 1985; Wilson, 1992):

- (1) The diversity of organisms and habitats at different scales (e.g. genetic, species, ecosystem) is positive.
- (2) The untimely extinction of organisms and habitats at different scales is positive.
- (3) Ecological complexity is desirable.
- (4) Allowing evolutionary processes to occur is positive.
- (5) Biodiversity has extrinsic or anthropocentric value in terms of the goods and services it provides humankind.
- (6) Biodiversity has intrinsic or biocentric value.

‘Biodiversity is essential for the continued development of the tourism industry’, although there is ‘an apparent lack of awareness of the links – positive and negative – between tourism development and biodiversity conservation’ (Christ, Hielel, Matus,

& Sweeting, 2003). Tourism is usually regarded as an anthropocentric or economic justification for valuing biodiversity particularly with its long-recognized role in the creation of national parks and reserves. Moreover, tourism is increasingly being recognized as a significant beneficiary of biodiversity. Although tourism can be a mechanism to benefit biodiversity and the maintenance of natural capital, many of the factors linked to biodiversity loss such as land clearance, pollution and climate change are also related to tourism development (Gossling & Hall, 2006; Gossling, Hall, Lane, & Weaver, 2008; Gossling, Hall, Peeters, & Scott, 2010). Tourism therefore provides both positive and negative contributions to biodiversity conservation (Table 3) (Hall, 2006). Unfortunately, the balancing act that these contributions represent is often never fully accounted for in the assessment of the costs and benefits of tourism (Hall & Lew, 2009), particularly in relation to the supposed benefits of tourism as a means of pro-poor and sustainable development (Gossling, Hall, & Scott, 2009; Gossling et al., 2010; Hall, 2007, 2010a, 2010b, in press a). Nevertheless, the failure of tourism to successfully balance its demands on natural capital, what Hall (2009, 2010a) describes as 'steady-state tourism', is nothing new, and arguably underlies much thinking on sustainable tourism (Hall, in press a; Holden, 2000). For example, although the concept of scarcity rent underlay much of earlier thinking with respect to the value of ecotourism – reduce access to desirable environment or wildlife in the face of high demand and charge more for the experience while reducing environment impacts – sounds sensible, it has often foundered on cultural and political values that have historically favored access (Hall, 2006). Indeed, for most of their history, national parks agencies have actively sought to encourage visitation so as to meet the recreational component of their mandate and to create a political environment supportive of national parks (Butler & Boyd, 2000; Hall, 1992; Runte, 1987). Unfortunately, in the face of growing populations and personal mobility, the consequences of increased access and mobility is becoming problematic for many conservation authorities.

One of the few positive indicators with respect to biodiversity conservation is the protection of areas of conservation value (Tables 1 and 2). As noted above, tourism, and ecotourism, in particular have provided an economic rationale for the establishment of national parks and reserves that serve to conserve species and

habitats (Buckley, 2009). The global conservation estate has grown enormously since the first UN List of Protected Areas was published in 1962 with 9214 protected areas covering an area of 2.4 million km². The 2003 edition listed 102,102 sites covering 18.8 million km² (Frost & Hall, 2009). 'This figure is equivalent to 12.65% of the Earth's land surface, or an area greater than the combined land area of China, South Asia and Southeast Asia' (Chape et al., 2003). Of the total area protected, it is estimated that 17.1 million km² constitute terrestrial protected areas, or 11.5% of the global land surface, although some biomes, including Lake Systems and Temperate Grasslands, remain poorly represented. Marine areas are also significantly under-represented in the global protected area system with an estimated 0.5% of the world's oceans included in protected areas (Chape et al., 2003). Nevertheless, the present size of the global conservation estate exceeds the IUCN's earlier target of at least 10% of the total land area being set aside for conservation purposes, although there is clearly substantial variation between both countries and biomes in terms of the actual area set aside (Chape et al., 2003). Yet it has been suggested that the IUCN's target has been dictated more by political considerations than biological science (Soule & Sanjayan, 1998). Rodrigues and Gaston (2001, 2002) observed that the minimum area needed to represent all species within a region increases with the number of targeted species, the level of endemism and the size of the selection units. They concluded that no global target for the size of a network is appropriate as those regions with higher levels of endemism and/or higher diversity will correspondingly require larger areas to protect such characteristics; a minimum size conservation network sufficient for capturing the diversity of vertebrates will not be sufficient for biodiversity in general, because other groups are known to have higher levels of endemism (Gaston, 2003); the 10% target is likely to be grossly inadequate to meet biodiversity conservation needs. Studies of species–area relationships suggest that 30–50% of a given community or ecosystem type needs to be conserved to maintain 80–90% of the species (Soule' & C.M. Hall Sanjayan, 1998). However, in their analysis of the conservation deficits for the continental USA, Dietz and Czech (2005) noted that even 30–50% may not be enough to sustain species in the long term with research indicating that there is no single threshold value that can be broadly applied to

conserve all species (Fahrig, 2001). Just as importantly, it should also be noted that the areas set aside as protected areas in most countries have historically been those with low biological diversity (Frost & Hall, 2009; Hall, 1992; Scott et al., 2001), and have usually been biased towards locations where they can least prevent land conversion (Joppa & Pfaff, 2009), a situation referred to by Hinds (1979) as the ‘cesspool hypothesis’ and Runte (1973) and Hall (1989, 1992) as the ‘worthless lands hypothesis’ of national park establishment (Frost & Hall, 2009).

Case studies for capitalization of ecosystem services targeted and interventions for sustainability (international, BalkanMed national, local)

In this section, different case studies are presented, regarding tourism as an ecosystem service and various interventions initiated by the private sector and other stakeholders.

Case Study 1: Chumbe Island Coral Park and Environmental Education Centre (Tanzania) – An Example of Private Initiative and Money Developing a Sustainable Tourism Industry that Contributes to Conservation

Chumbe Island is a private marine park in the Indian Ocean off the coast of Zanzibar, Tanzania. The park is located in an uninhabited island covered by a very significant coral rag forest and surrounded by a coral reef of exceptional biodiversity and beauty. The aim of the operation was to create a model of sustainable area management where ecotourism supports conservation and education.

The Chumbe Island Coral Park & Environmental Education Centre is a private nature reserve developed by a company that was created for that purpose in 1992, named the Chumbe Island Coral Park Ltd. (CHICOP). Chumbe Island is a rare example of a pristine coral island ecosystem in an otherwise heavily over-fished and over-exploited area. Based on the initiative of CHICOP, the island was registered as a protected area, in 1994, by the Government of Zanzibar. The reserve includes a reef sanctuary, which has become the first registered marine park in Tanzania, and a forest sanctuary. The management of these has been entrusted to a private company, CHICOP.

The project to establish the marine reserve and to create tourism facilities was funded by several sources. About two thirds of the US \$1 million cost was privately financed by an individual who initiated the project. The remainder came from various international governmental, non-governmental and private donors. The idea of developing an ecotouristic site that could contribute to conservation and community development was attractive to many people. As a result more than 30 volunteers, from several countries, provided professional support to the project.

The management of the site by CHICOP is assisted by an Advisory Committee with representatives from neighboring fishing villages, the Institute of Marine Sciences (IMS) of the University Dar es Salaam and Government officials of the Departments of Environment, Fisheries and Forestry respectively. The Advisory Committee meets one or more times per year.

The tourism facilities include seven bungalows that offer accommodation on the island for up to 14 guests at any one time. In addition, day trips are offered to 12 more visitors per day. Groups of school children, summing up to 1,600 per year, are brought on day excursions for environmental education purposes.

The Chumbe Island development reveals considerable long-term vision in the selection of objectives and in planning. The project took a decade, from the early 1990s to present, to develop. Key factors contributing to the success of the project involved: 1. The involvement of local people in all aspects of the development 2. The local residents acting as park wardens proved to be effective in minimizing destructive activities to the reef ecosystem 3. The careful design of the tourism facilities resulted in minimal negative environmental impact during construction and during operation 4. The restoration of the native forest and the recovery of the breeding bird populations were considerably enhanced by the complete removal of a plague of introduced rats 5. The protection of the globally significant coral reef was assisted considerably by the tourism project 6. The gazetting of the marine reserve, the first in the country, by the national government was stimulated by the project 7. The creation of national law to allow for the private management of conservation areas was stimulated by the project, and 8. Chumbe Island now visibly represents part of the Zanzibari and Tanzanian cultural heritage.

Case study 2: Parks and Ecotourism in West Mongolia (Mongolia) – An Example of the Opportunities and Constraints for Ecotourism

West Mongolia contains a rich landscape with high ecological diversity and a vibrant culture. This area is composed of three provinces, Bayan-Ulgii, Khovd and Uvs, and covers 191,000 km². The western Altai Mountain Range and the eastern Basin of the Great Lakes contain rich biological resources. West Mongolia has many resources that are of considerable interest to ecotourism. This case study illustrates that many challenges must be addressed during the process of building a vibrant tourism industry that will help to protect and develop the area in positive ways. A number of challenges are outlined, and comments are made on possible solutions.

At present, only a small number of tourists come to West Mongolia. In 1998, only 400 people visited Tavan Bogd National Park, while numbers of visitors for other areas were much smaller, such as 10 visitors reported at Uvs Lake, and 100 visitors at Khar Us Nuur. Given the potential importance of park tourism to economic development in the region, it is necessary to understand the constraints that limit ecotourism. Since Mongolia is such an interesting ecologically and culturally rich area, it is likely that nature-based tourism will develop over time.

1. Potential Constraints: Short tourist season Visitation to the area occurs primarily during the months of July and August. Although, these are the warmest months, they also are the months with the highest levels of precipitation. May, June, September and October would be better months for visitation, and need to be developed further.
2. Accessibility: The remote location is another potential constraint. The road distance from the capital city, Ulaanbaatar, to the western provinces is 1425 km, of which only 430 km is paved. It takes a jeep three or four days of hard travel to make the trip one way. An alternative is the Mongolian airline, MIAT, which was experiencing financial, scheduling and safety problems in the mid-1990s. Since that time, financial and safety conditions have improved, and flight schedules now change only when bad weather occurs. Two more private air companies have been created which serve tourists by helicopter and plane. Access and uneasy travel provide a very difficult challenge for tour operators, who must operate a regular and predictable schedule. As tourism volume grows, more funds will flow into the travel

industry and conditions will improve. However, for the near future the tourism market must be aimed at people who are willing to have flexibility in their travel plans.

3. Agency resources: The newly-established park system is under development. The new park administrations are sparsely staffed and have little experience in tourism. One big problem is the very small number of rangers and small budget compared to the immense size of the parks. Now that the basic park system is in place, it is important that funds be found to increase the number of park rangers and the level of expertise in tourism management.

4. Tourism infrastructure: Due to the low numbers, there is very little tourism infrastructure. Campsites, hotels, ger sites (tent structures), information signs, maps, designated routes, and information centers are almost non-existent. Important services such as qualified guides, foreign language interpreters and car rental services are not present. These gaps are very challenging for tourists. The earliest stages of tourism occur under such conditions. As tourism develops, it stimulates an increased supply of services and programs. This area would be a good place of emphasis by foreign aid projects.

5. A support network and partnerships: The local tour operators are just starting in business. They tend not to have international business contacts or experience. The few operators that do exist find that they must be very self reliant, and as such make little contact with the park managers or the local communities. These first, hardy tour operators will forge the way for many that will follow later as the conditions improve.

Conclusions

Many people have heard that tourism will bring benefits. These hopes are often too inflated, and are not balanced by a good understanding of the requirements and the costs of ecotourism. It is important to establish realistic expectations.

This situation in West Mongolia shows tourism constraints that are common challenges in many locations throughout the world. Once constraints are recognized, then planning can begin to address them. Fortunately, some efforts have been made by the World Wildlife Fund (WWF) and the United National Development Program (UNDP) to identify constraints faced by the tourism industry in Mongolia, and these

organizations are undertaking valuable work to address these, and other, park management and ecotourism issues.

Tourism volume and impacts will grow in Mongolia. In the 1990s, efforts were directed towards establishing a protected area system in Mongolia. Creating legislation to protect areas of natural and cultural significance was a successful beginning to the sustainable tourism development process. Mongolia has tremendous ecotourism potential, due to the rich natural and cultural resources associated with it. The planning to fulfil this potential must address these challenges and focus on building a sustainable tourism program that is culturally, environmentally and fiscally responsible.

Issues and Potential Constraints Related to Tourism Development

Anticipating direct negative impacts or results of tourism development is only the first step. Often, it is also necessary to examine the underlying causes of the impact. Why have local populations shifted to areas of high tourism concentration? Answers to this question help determine solutions that minimize the problems associated with the original negative impact (i.e., population migration). Sometimes by focusing on the less visible, less direct, underlying causes, negative impacts can become more treatable.

In the example of population migration, an explanation for the migration could be a higher perceived quality of life attainable through involvement with tourism compared to a lower quality of life through continued practice of traditional jobs. The result is an influx of rural people to tourism centers.

If the underlying aim of the migrating people is to earn better money in order to increase their standard of living, then once local governments and organizations realize this as the underlying cause of migration, steps can be taken to develop policies or programs that address this concern. For example, one potential solution is to provide financial incentives to farmers to subsidize production. Another option is to encourage hotels and restaurants to purchase produce from local farmers, thus increasing demand for their products. Often a combination of solutions can be implemented together. The desired result is a more even distribution of wealth and benefits associated with the increased tourism to the area. Plans that accomplish

this will enable tourism migration to occur in a more organized and less detrimental manner. Determining the underlying causes of the problem and developing a mixture of potential solutions that address the negative impact is more realistic and useful than simply announcing that population migration is a negative impact and trying to prevent it from occurring.

An interdisciplinary team with representatives from government planning, private developers, park managers and local communities should examine the potential advantages and disadvantages of sustainable tourism development in their area (British Columbia Round Table on the Environment and the Economy, 1992). Costs and benefits need to be weighed against each other, and a conclusion made as to whether the benefits outweigh the costs. If they do not, then a different plan must be proposed (e.g., development may still be desirable for the area but at a lower level than currently being considered, or perhaps it is decided that development would be too harmful to promote).

When considering sustainable development, this cost-benefit ratio must be examined both directly in terms of tourism, while also taking into consideration the range of activities and industries present in the area as a whole. Sustainability within sectors such as agriculture, manufacturing and tourism (especially in locations where the economy is heavily dependent on these industries) is vital to achieving overall sustainable development.

Natural and cultural significance was a successful beginning to the sustainable tourism development process. Efforts must now be directed to careful planning during these next stages in order to ensure that the changes and the impacts associated with tourism are in the most positive of directions. The Need for Local People Participation and Support

Case study 3: Mount Sorak National Park and Biosphere Reserve (South Korea) – An Example of the Importance of Working with Local People in Management and Decision-Making Processes.

Mount Sorak was designated as a nature reserve in 1965, and as the fifth national park in South Korea in 1970. In 1982 it was also designated as South Korea's only biosphere reserve. Approximately 90% of all biosphere reserves in the world are

overlapped with protected area designation such as national parks. The biosphere reserve covers 393.49km² and crosses one city and three counties. Roughly 66% of the area is national and public land, and 34% is overlapping with private lands or temple property. It attracts roughly 3.5 million visitors per year. Even after receiving a biosphere designation, nature conservation continued to be the main focus of management, with little attention given to issues related to the development and logistic support functions associated with biosphere reserves. Park managers just recently started to take human influences into consideration (Shim, 1999).

The Source of Conflict: After the park was created, local residents were informed that they could no longer continue their traditional resource use of the land. Obtaining mountain vegetables, mushrooms, acorns and sap was completely banned in the name of park protection. Enforcement occurred through stationing guards at the entrance of trails and assigning patrols in different regions. For many years residents in Mount Sorak National Park have refused to co-operate in managing the park. In resistance to park regulations that were imposed without consideration of human activities and needs in the area, some residents, tourists and professional collectors averted regulations and restrictions and plucked mountain vegetables illegally. Since the 1980s they have also filed many complaints attempting to get various small areas ranging from 1-8 km² excluded from the national park boundaries.

The relationship between ecosystem conservation and development of local communities should not be confrontational, but negative feelings existed on both sides. Park staff came to expect local communities to be the source of complaints, and communities came to distrust and resent park staff.

There are many drawbacks to poor relationships between government park agencies and local communities. A direct negative result is that local communities do not want to support conservation efforts such as obeying regulations. An indirect negative side effect of hostile relationships between park agencies and local residents is that park staff could not expect assistance from local residents to fight fires.

Attempting to Move Through the Conflict: Recently, Mount Sorak National Park Office established an Ecosystem Conservation Plan, from 1998 to 2007, in order to investigate ecosystem status and environmental conditions, examine conservation

oriented policies and systems, implement ecological park management and establish a base for ecological park management. It is expected that an improved management approach will be created and that through a national park management plan some attention will be given to natural resources. However, it is also necessary to address issues of visitor management and local involvement. This is especially true in many parks in East Asia, since many local people live in and near borders of protected areas. In order to encourage sustainable development, park staff must pay attention to the needs and demands from local communities in park development and buffer zones (e.g., in South Korea national parks these are Human Settlement and Mass Facility Zones).

To create a common focus, discussions amongst the various stakeholders are a basic mechanism through which learning processes and negotiations have initiated.

After a long history of complaints and poor relations, park agency staff at Mount Sorak began to listen to local people's needs and concerns. In 1995, the National Parks Association decided to examine the feasibility of the park boundary every 10 years and modify park zones if necessary, with the understanding that the total park area must remain the same. The ecosystem management plan proposes that it is realistic to exclude some areas from park zoning, which shows that some progress is being made. Park staff are making the effort to listen to and understand the motives behind local people's resistance. Rather than viewing local residents as troublemakers and the source of complaints, park staff must work on viewing them as partners for park management. Efforts to establish mutual co-operation and coordination, and the involvement of local communities (rather than excluding them) must also be made.

In addition, park agency staff realized that conservation objectives could not be achieved only through regulations that were not developed in consideration of local community concerns. As a result, the regulation that banned mountain vegetable plucking was reviewed in the context of local residents. In 1999 permits were given to local residents in three communities, which allowed them to once again, harvest, legally mountain vegetables for subsistence and income for the first time in almost two decades.

2.5. Sustainability and tourism

Despite all of the growing industry's positive economic effects, there are also several negative environmental externalities that have resulted from a thriving tourism industry. These negative impacts on the environment arise when the volume of visitor use in an area exceeds the environment's ability to sustainably deal with said use. Tourism, in its current form, has unfavorably affected local environments around the globe by depleting natural resources through water use and deforestation and by contributing to soil erosion, global warming, a loss of biodiversity, and natural habitat loss. However, as environments shift due to the tourism industry, initiatives to mitigate the negative effects on the environment have arose, such as ecotourism and green hotel practices.

The United Nations Environment Programme identifies specific ways in which recreational travel adversely affects the natural and built environments. Tourism can lead to a depletion of natural resources by increasing consumption in areas where resources are sparse ("Tourism's Three Main Impact Areas"). For instance, tourism and travel industry uses heavy amounts of water to fill pools and fountains, maintain golf courses, and provide other services to guests. This process creates a lot of wastewater and also diverts a vital resource away from locals who rely on it for survival. In dryer climates, such as the American Southwest or the Mediterranean, this overuse of water can have especially severe consequences on the local environment ("Tourism's Three Main Impact Areas"). The biggest culprit of water exploitation is the golf industry. Golf courses require a lot of water daily and, according to Tourism Concern, "an average golf course in a tropical country such as Thailand needs 1500kg of chemical fertilizers, pesticides and herbicides per year and uses as much water as 60,000 rural villagers" ("Thailand"). In areas where water resources are restricted, this type of ground-water depletion can decrease water quality, decrease the soil quality, and lead to subsidence (sinking of the Earth's surface), often contaminating the water supply and hurting the local economy and/or ecosystem (Perlman).

Of course, water resources are not the only raw materials that tourism overexploits. In order to clear land for buildings and collect fuel for the industry, localities can overharvest wood leading to deforestation and a disruption of the ecosystem. For

example, as tourism to the Himalayas increased throughout mid-20th century, local Sherpas began to ignore forest conservation traditions. In a short period of time, Sherpas cut down large volumes of trees in order to sell firewood to and profit from mountaineering expeditions to Mt. Everest and other high peaks. Furthermore, during the 1980s, pressures on the forest became more intense as Sherpas began to use profits from firewood sales and trekking work to build inns and large houses. Additionally, overgrazing in certain areas prevented the forests from recovering and also damaged forest ecology. Although the extent and nature of the Himalayan deforestation are disputed, an increase in tourism in the region does coincide with “thinned forests, diminishing tree size, changes in forest composition, and scarcity of forest floor deadwood near settlements”. This deforestation is taking its toll on the local ecosystem. Based on analysis of satellite images, a 2006 study predicted that two-thirds of the Himalayan forests would be gone by 2100. This forest degradation could result in the extinction of up to 25% of the species unique to the region by the end of the century.

In addition to resource depletion, tourism can adversely impact the environment by producing massive amounts of pollution. Increased movement of people across the globe (1186 million international tourist arrivals in 2015 up from 25 million in 1950), means that transport by plane, car, and train is continuously expanding (*UNTWO Tourism Highlights* 3). One result of increased tourism, especially air travel, is that tourism is now responsible for a substantial part of global carbon dioxide (CO₂) emissions. Some studies estimate that a “single transatlantic return flight emits almost half the CO₂ emissions produced by all other sources (lighting, heating, car use, etc.) consumed by an average person yearly” (“Tourism’s Three Main Impact Areas”). In fact, the global aviation industry emits two percent of all human-produced CO₂.

Increased CO₂ and other greenhouse gases in the atmosphere is most prominently linked to global warming. Over the past 50 years, and especially since the turn of the 21st century, the average global temperature has increased at the fastest rate in recorded human history. Global warming takes place when CO₂ and other greenhouse gases accumulate in the atmosphere, and, instead of allowing solar radiation to escape into space, absorb solar radiation and entrap heat. Global

warming has already started to, and will continue to, alter climates in both positive and potentially devastating ways. Although certain climates may become more temperate and fertile as a result of a rise in global temperatures, the potential (and realized) negative impacts of global warming are ominous. People living near glaciers will likely experience increased flooding and rock avalanches as glaciers melt and recede, droughts will be prolonged, wildfires will increase in frequency, and sea levels will continue to rise, threatening tens, if not hundreds, of millions of people living in low-lying coastal regions. By 2100, scientists have predicted that water levels in certain regions could rise 4-6 feet. In addition, ocean ecosystems could be threatened, as coral reefs, some of the most diverse ecosystems in the world, could bleach and die due to temperature pressures, effecting thousands of marine species living in those areas.

One less obvious environmental impact of tourism is increased sewage pollution due to the construction of hotels and other recreational facilities. In many tourist regions, wastewater has polluted the waters, damaging the flora and fauna, and, in certain cases, threatening the health of humans. For example, sewage pollution can transmit diseases, such as typhoid, cholera and hepatitis through seafood.

Sustainability is a key theme of global tourism development. One of the most comprehensive policy-aimed documents regarding sustainable tourism is the European Charter for Sustainable Tourism in Protected Areas (Europarc Federation, 2002). The Charter aims to set standards and provide guidelines which park authorities, local businesses and tourism operators can use to create sustainable tourism. Although aimed at protected areas, in some ways the ten principles behind the charter make sense also for less protected areas:

1. Managing a range of impacts;
2. Contributing to conservation;
3. Preserving natural resources;
4. Supporting the local economy;
5. Involving the local community;
6. Developing appropriate quality tourism;
7. Welcoming new markets;

8. Creating new forms of employment;
9. Encouraging environmentally friendly behavior;
10. Providing a role model for other sectors.

Though the ideas proposed in this model would indeed promote sustainable tourism, they are not without challenges. For instance, contributing to conservation (Principle 2) while preserving natural resources (Principle 3) seems on the surface to be an excellent twinning of ideas. Combined, they mean that tourist activities will not negatively impact the natural environment, but rather conserve it. This is an admirable ideal, but achieving these aims requires careful monitoring. In practice, monitoring may be difficult to achieve. One of the problems with regard to monitoring is how to determine what level of change is tolerable given increased tourist use. This concept of 'limits of acceptable change' (LAC) is a tool which was originally developed in order to regulate the use of designated wilderness areas in the United States. It is different from the concept of carrying capacity, which refers to 'the maximum number of people who can use a site without an unacceptable alteration in the physical environment and without an unacceptable decline in the quality of experience gained by visitors'. Carrying capacity appears on the surface to be scientific, however determining what is 'acceptable' either in terms of changes to the environment or quality of experience is a subjective process. 'Quality of experience' itself is a subjective criteria and subject to variation between different groups of visitors. Finally, carrying capacity is of limited use to managers because they are generally more concerned with managing conditions than numbers. The LAC framework is more useful in management because it emphasizes the participation of all interested parties, including local communities, in deciding what level of environmental and social impact is acceptable. Despite this trend towards participative methods in management decisions, ecologists still tend to pay particular attention to answering the questions of what constitutes natural tourist capacity. However, local municipalities must have a lucrative source of revenue in order to support eco-cultural tourism. Where this is not the case, pressure builds to develop tourism with a heavy environmental impact. This in turn leads to a struggle between indigenous and exogenous people and between politicians and scientists.

Environmentally sustainable eco-cultural tourism is hard pushed to be financially self-sustaining: limited numbers mean limited profit. Limiting measures on tourism development are not always in accordance with local wishes for improved financial gain. This is despite the (ironic) fact that over-use depletes natural and cultural (i.e. revenue) resources. Sustainable tourism discourse addresses these issues on a number of levels. However, the need to provide financial gain can change priorities in cultural tourism from education to entertainment as the desire for nostalgia translates to profit. There are frequently times when sacrificing the sacred cow of education in museum presentation is worthwhile if it means local people benefit. One should reconsider the terminology of museums and call such overly entertaining endeavours 'theme or heritage parks'. Following the principles of sustainable eco-cultural tourism often requires a move from what might be called idealistic sustainability to realistic sustainability. Another point to consider in this context is the extent to which the goals of sustainability reflect existing hegemonic influences. Although the principles of sustainability make sense from a scientific viewpoint, from a local perspective they may also reflect imperialist and orientalist views of development. Yet, the following case studies show that sustainable tourism nevertheless provides excellent opportunities for a balance to be drawn between the needs of marginal local communities for financial betterment and the simultaneous preservation and promotion of their natural and cultural heritage.

A model for eco-cultural tourism: the Federsee Bog, Germany

The first example of a sustainable eco-cultural tourism is presented as the ideal. The Federsee Bog is a wetland landscape surrounding a receding lake in southwest Germany. It is protected by the Natura 2000 and LIFE-Projects. The Federsee Bog hosts many endangered plant and animal species, and is recognized as a European Reserve by Birdlife International. This wetland landscape also holds numerous prehistoric sites, many of which provide critical keys to European prehistory through the outstanding preservation conditions associated with the bog. Here, it should be noted that the water table of the lake and surrounding sites are receding due to land-use, thus endangering the future preservation of archaeological sites and the bog. This rich cultural and natural landscape is open to the public, with a 9.5 km long trail circumnavigating the lake. Along the trail are 11 points of interest, which

combine information on the evolution of the natural landscape with archaeological sites occurring along the path. Intended as an independent way to enjoy and learn about the landscape, the wetland nature trail (Moorlehrpfad) complements the frequent talks and tours of the archaeological sites and natural features. Within this landscape and the wetland nature trail is the Federsee museum. This museum was founded in 1919 by the Württemberg State Museum in Stuttgart. Although aimed to present the archaeology of the area, the ethos of nature and culture can be felt throughout the museum. Even the architecture of the building speaks for this ethos. It is a large, peaceful-looking structure situated over water at the edge of the Federsee, using the natural light and landscape to set off its displays. There is a strong interactive element to this museum, which since 2000 has also supported an open-air component. This open-air part of the museum was funded by the EU and the City of Bad Buchau. Local craftsmen were involved to construct the buildings, which are 1:1 models of houses from different prehistoric time periods that were found around the Federsee. Many of the tourists come to the Federsee in order to use the health spa next to the museum. Taxes from the spa enables the City of Bad Buchau to financially support the archaeological and ecological endeavours. People using the spa also tend to visit the open-air museum and walk along the nature paths. Most of the visitors of Federsee are repeat visitors. This is an extremely important element to the sustainability of the eco-cultural endeavours. It means that elements of the visit, whether the peaceful nature, dynamic culture, or both, are worth enjoying more than once. The Federsee Bog and its combination of cultural and natural tourism complies with virtually every principle of sustainable tourism. Management is offered through a variety of public agencies, working with local, regional and inter-European bodies. Another strong reason for the success of the Federsee's eco-cultural tourism is the control wielded by local and regional municipalities. Initial funding for the protection and development of the nature reserve and accompanying archaeological monuments came from a variety of international to local sources. The nature preserve is directed by both the District Office for the Protection and Conservation in nearby Tübingen and the locally based NABU-Conservation Centre. The archaeological museum and excavations are supported by local businesses, government and regional governmental agencies. The

integrated approach contributes to the conservation, and natural resources are preserved via an extensive recycling programme and recreational path system. Disabled access is provided in as many places as is financially possible, thus promoting social inclusion. There is frequent interaction between archaeologists and ecologists and the public. This is also part of the success of this endeavour, for the public has frequent opportunities to interact with these Fachmänner (specialists). Tours of the landscape and archaeological excavations take place every summer, promoting education, discussion and opportunities for interaction. Local people visit excavations more frequently and are often welcomed by the excavators. The local economy benefits from the tourist trade in terms of local cafés and hostelries. Indeed, the archaeological research season, which has taken place almost every summer for the last three decades, also supports the local economy. This has proven to be a reciprocal support system, for the local municipalities and businesses often provide housing for the non-local archaeological excavators. Not all excavators digging around the Federsee are external however. In addition to traditional stakeholders, local youths also work as seasonal excavators. This creates job opportunities that otherwise would be difficult to find, as well as education and cultural exchange when foreign excavators are also present, thus further integrating archaeology and science with the local communities. Some of these local seasonal excavators have used such experiences as the basis for a career in this field or teaching the subject to local schoolchildren. In this way, the work of today at the Federsee is likely to continue in the future. The final important point about the Federsee's sustainable tourism is that neither the prehistory nor the nature preserve alone would probably be enough in themselves to encourage the forms of tourism we see in their combination. It is because of this that the example of the Federsee could inspire eco-cultural tourism in other landscapes where local people want sustainable tourism, but lack outstanding biodiversity or archaeology. This example shows that even marginal areas of interest can support sustainable tourism when knowledge of the cultural and natural landscapes combine into a public presentation. So ecocultural tourism is not just another addition to academic jargon, but a reality and opportunity for local self-determination.

Tourism can also bring economic changes, along with cultural ones. This study has not presented this process in detail but the case studies, which combine eco-tourism and cultural tourism, have broad ranging implications for the implementation of sustainable tourism. The focus of these case studies has been the development of sustainable forms of eco-cultural tourism in rural areas in Europe. This model for eco-cultural tourism is aimed at communities whose natural or cultural resources on their own would not be enough to develop sustainable tourism. Eco-cultural tourism is based on the principle of cooperation between local people, managers and 'specialists' such as archaeologists, anthropologists and ecologists. One of the most important features of cooperation is mutual respect and 'communicative action'. Constituencies with different levels of power can sustain dialogues through sharing 'common language' and 'life worlds that permeate and intertwine with one another'. The case study from Finland showed how some local people in that area feel that they are less powerful in the decision-making process for conservation and tourism than ecologists and politicians. Likewise, in Lac de Chalain, conflict emerged between the archaeologists and local people regarding land use and tourism. Instead of focusing on differences, the common language of those different parties developing ecocultural tourism could be based on the shared appreciation of both the natural and cultural resources of a given area. In Finland, data from the European Commission's 5th Framework Integrated Management of European Wetlands project (www.dur.ac.uk/imew.ecproject) indicate that parties involved in tourism share an underlying appreciation for the natural and cultural environment. The key is to bring these parties together to discuss their shared ideals, limits of acceptable change and ways to fund and manage the desired enterprises. Eco-cultural tourism follows the ten principles for sustainable tourism which underlay the rationale behind the European Charter for Sustainable Tourism in Protected Areas. The Federsee case, in Germany, provided an example of how eco-cultural tourism works in practice. In that case, eco-cultural tourism contributes to conservation and encourages environmentally friendly behavior. In addition, natural and cultural resources are maintained for future generations, through eco-cultural tourism. Profits from eco-cultural tourism endeavors remain within local communities instead of 'leaking' to outsiders. In supporting local economies and creating employment,

knowledge about the area gained through the scientific endeavors feed back into formal and informal education systems. This model for eco-cultural tourism is effectively being applied today in Europe, but the question remains whether it might be possible to extend its application to new areas. The answer is yes, but with some limitations. Funding is the most important practical constraint. As the Lac de Chalain case study showed, sustainability can be quite separate from profitability. For this reason, outside funding, such as from non-governmental organizations or national, regional and local governments may be first required to develop and maintain eco-cultural tourism in the short term. The immediate return value for these funding bodies is the employment and education of local people and the longer-term, sustainable development of otherwise underrated and underused natural and cultural resources. Most of all, giving local communities the opportunity to develop in the ways that they want may create unpredictable long-term benefits. With empowerment and long-sighted views anything is possible.

2.6. How tourism can contribute to environmental conservation Environmental Education and Sustainable Development

According to UNESCO's recent documents, sustainable development is the “ultimate goal of the Man- Environment relationship”; thus, the whole educational process should be “reshaped for sustainable development.” In view of the extreme importance of their educational impact, such statements need to be discussed. To which conception of environment, of education and of sustainable development does the concept of environmental education for sustainable development refer? This article presents theoretical tools that can be used to undertake a critical analysis of these constructs. Finally, the idea of including environmental education in the broader scope of an education for the development of responsible societies is considered. The principles of environmental education (EE), which are set forth in the Tbilissi Declaration (UNESCO-UNEP, 1978, pp. 26-27) already include the fundamental elements of sustainable development: the need to consider social aspects of the environment and take into account the close links between economy, environment and development; the adoption of both local and global perspectives; the promotion of international solidarity, etc. However, “the idea of environmental protection was never cut off from the idea or the need for a

particular type of development.” Nevertheless, interest for a “new focus” in environmental education and the need to define the concept of environmental education for sustainable development (EEFSD) have emerged over the past few years. This orientation does not seem to add new objectives or principles to EE, nor to propose a different educational approach. The characteristics of EEFSD as defined by Daniela Tilsbury (1995) are holism, interdisciplinarity, value clarification and integration, critical thinking, issue-based and action learning, etc. What, then, is really new? No doubt, it was necessary to counter a certain conception that EE was focusing too narrowly on the protection of natural environments (for their ecological, economic or aesthetic values), without taking into account the needs and rights of human populations associated with these same environments, as an integral part of the ecosystem.

Sustainable development is: a process of making the emergent future ecologically sound and humanly habitable as it emerges, through the continuous responsive learning which is the human species’ most characteristic endowment a social learning process of improving the human condition a process which can be continued indefinitely without undermining itself. This way of thinking about sustainable development encapsulates the core role of learning as a collaborative and reflective process and captures the inter-generational dimension and the idea of environmental limits.

Regarding education for sustainable development there is a theme of “Promise and Paradox”. Two of the major issues in the international dialog on sustainability are population and resource consumption. Increases in population and resource use are thought to jeopardize a sustainable future, and education is linked both to population growth and resource consumption. Education may contribute to the control of population growth. By reducing the threat of overpopulation a country also facilitates progress toward sustainability. The opposite is true for the relationship between education and resource use. Generally, people with a high education level, who have higher incomes, tend to consume more resources than people with a lower education level, who tend to have lower incomes. Unfortunately, the most educated nations leave the deepest ecological footprints, meaning they have the highest per-capita rates of consumption. These consumption

rates drive resource extraction and manufacturing around the world. The figures from the United Nations Educational, Scientific and Cultural Organization (UNESCO) Statistical Year book and World Education Report, for example, show that in the United States more than 80% of the population has some post-secondary education, and about 25% of the population has a four-year degree from a university. Statistics also show that per-capita energy use and waste generation in the United States are nearly the highest in the world. In the case of the United States, a higher level of education has not led to sustainability. Clearly, simply educating citizens to higher levels is not sufficient for creating sustainable societies. The challenge is to raise the education levels without creating an ever-growing demand for resources and consumer goods and the accompanying production of pollutants. Meeting this challenge depends on reorienting curriculums to address the need for more-sustainable production and consumption patterns. Every nation will need to reexamine curriculum at all levels, from pre-school to professional education. While it is evident that it is difficult to teach environmental literacy, economics literacy, or civics without basic literacy, it is also evident that simply increasing basic literacy, as it is currently taught in most countries, will not support a sustainable society.

Thresholds of Education and Sustainability Consider for instance, that when education levels are low, economies are often limited to resource extraction and agriculture. In many countries, the current level of basic education is so low that it severely hinders development options and plans for a sustainable future. A higher education level is necessary to create jobs and industries that are “greener” (i.e., those having lower environmental impacts) and more sustainable. The relationship between education and sustainable development is complex. Generally, research shows that basic education is key to a nation's ability to develop and achieve sustainability targets. Research has shown that education can improve agricultural productivity, enhance the status of women, reduce population growth rates, enhance environmental protection, and generally raise the standard of living. But the relationship is not linear. For example, four to six years of education is the minimum threshold for increasing agricultural productivity. Literacy and numeracy allow farmers to adapt to new agricultural methods, cope with risk, and respond to market signals. A basic education also helps farmers gain title to their land and apply

for credit at banks and other lending institutions. Effects of education on agriculture are greatest when the proportion of females educated to threshold level equals that of males. For females, education profoundly changes their lives, how they interact with society, and their economic status. Educating women creates more equitable lives for women and their families and increases their ability to participate in community decision making and work toward achieving local sustainability goals. Another educational threshold is primary education for women. At least a primary education is required before birthrate drops and infant health and children's education improve. Nine to 12 years of education are required for increased industrial productivity. This level of education also increases the probability of employment in a changing economy. Few studies have been carried out on how education affects environmental stewardship, but one study suggests that a lower-secondary education (or approximately nine years) is necessary to intensify use of existing land and to provide alternative off-farm employment and migration from rural areas. Finally, a subtle combination of higher education, research, and life-long learning is necessary for a nation to shift to an information or knowledge-based economy, which is fueled less by imported technology and more by local innovation and creativity. Education directly affects sustainability plans in the following three areas:

Implementation: An educated citizenry is vital to implementing informed and sustainable development. In fact, a national sustainability plan can be enhanced or limited by the level of education attained by the nation's citizens. Nations with high illiteracy rates and unskilled workforces have fewer development options. For the most part, these nations are forced to buy energy and manufactured goods on the international market with hard currency. To acquire hard currency, these countries need international trade; usually this leads to exploitation of natural resources or conversion of lands from self-sufficient family-based farming to cash-crop agriculture. An educated workforce is key to moving beyond annex tractive and agricultural economy.

Decision making: Good, community-based decisions - which will affect social, economic, and environmental well-being - also depend on educated citizens. Development options, especially "greener" development options, expand as

education increases. For example, a community with an abundance of skilled labor and technically trained people can persuade a corporation to locate a new information-technology and software-development facility nearby. Citizens can also act to protect their communities by analyzing reports and data that address community issues and helping shape a community response. For example, citizens who were concerned about water pollution reported in a nearby watershed started monitoring the water quality of local streams. Based on their data and information found on the World Wide Web, they fought against the development of a new golf-course, which would have used large amounts of fertilizer and herbicide in maintenance of the grounds.

Quality of life: Education is also central to improving quality of life. Education raises the economic status of families; it improves life conditions, lowers infant mortality, and improves the educational attainment of the next generation, thereby raising the next generation's chances for economic and social well-being. Improved education holds both individual and national implications. Education is held to be central to sustainability. Indeed, education and sustainability are inextricably linked, but the distinction between education as we know it and education for sustainability is enigmatic for many. The following section describes the components of education for sustainability. Education for sustainability carries with it the inherent idea of implementing programs that are locally relevant and culturally appropriate. All sustainable development programs including education for sustainability, must take into consideration the local environmental, economic, and societal conditions. As a result, education can take many forms around the world. Education for sustainability was first described by Chapter 36 of Agenda 21. This chapter identified four major thrusts to begin this sort of work: (1) improve basic education, (2) reorient existing education to address sustainable development, (3) develop public understanding, awareness, and (4) training.

Improving Basic Education - The First Priority was the promotion of basic education. The content and years of basic education differ greatly around the world. In some countries, for instance, primary school is considered basic education. In others eight or 12 years is mandatory. In many countries, basic education focuses on reading, writing, and ciphering. Students learn to read the newspaper, write letters, figure

accounts, and develop skills necessary to fulfill their expected roles in their households and community. Students also learn how their government functions and about the world beyond their community. Simply increasing basic literacy, as it is currently taught in most countries, will not advance sustainable societies. Indeed, if communities and nations hope to identify sustainability goals and work toward them, they must focus on skills, values, and perspectives that encourage and support public participation and community decision making. To achieve this, basic education must be reoriented to address sustainability and expanded to include critical-thinking skills, skills to organize and interpret data and information, skills to formulate questions, and the ability to analyze issues that confront communities. In many countries, the current level of basic education is too low, severely hindering national plans for a sustainable future. In Latin America and the Caribbean, many countries have six to eight years of compulsory education with approximately five to 15 percent of the students repeating one or more years. In parts of Asia, especially Bangladesh, Pakistan, and India, many children only attend school for an average of five years. A complicating factor in this region is that many girls receive fewer years of schooling to create that average. In parts of Africa, where life is disturbed by drought or war, the average attendance in public education is measured in months, not years. Unfortunately, the lowest quality of education is often found in the poorest regions or communities. The impact of little and/or poor-quality education severely limits the options available to a nation for developing its short- and long-term sustainability plans. As nations turned their attention to education in the 1990s and the new millennium, they have made much progress in basic education. In fact, enrollment rates in primary education are rising in most regions of the world. Also, enrollment of girls has increased faster than that of boys, which is helping to close the gender gap, evident in so many countries. At the global level, the gender gap in both primary and secondary school is narrowing. Despite all of this progress, too many female children remain out of school, and the gender gap will not close prior to the "Education For All" target date of 2005. The recognition of the need for quality basic education sets education for sustainability apart from other educational efforts, such as environmental education or population education.

Reorienting Existing Education - The Second Priority.

The term "reorienting education" has become a powerful descriptor that helps administrators and educators at every level (i.e., nursery school through university) to understand the changes required for education for sustainability. An appropriately reoriented basic education includes more principles, skills, perspectives, and values related to sustainability than are currently included in most education systems. Hence, it is not only a question of quantity of education, but also one of appropriateness and relevance. Education for sustainability encompasses a vision that integrates environment, economy, and society. Reorienting education also requires teaching and learning knowledge, skills, perspectives, and values that will guide and motivate people to pursue sustainable livelihoods, to participate in a democratic society, and to live in a sustainable manner. The need to reorient basic and secondary education to address sustainability has grabbed international attention, but the need at the university level is just as great. Society's future leaders and decision makers are educated there. If these young people are expected to lead all sectors of society (e.g., government, medicine, agriculture, forestry, law, business, industry, engineering, education, communications, architecture, and arts) in a world striving toward sustainability, then the current administration and faculty members must reorient university curriculums to include the many and complex facets of sustainability. In reorienting education to address sustainability, program developers need to balance looking forward to a more sustainable society with looking back to traditional ecological knowledge. Indigenous traditions often carry with them the values and practices that embody sustainable resource use. While returning to indigenous lifestyles is not an option for the millions of urban dwellers, the values and major tenets of indigenous traditions can be adapted to life in the 21st century. Reorienting education to address sustainability is something that should occur throughout the formal education system - that includes universities, professional schools (e.g., law and medicine), and technical schools in addition to primary and secondary education.

Public Understanding and Awareness - The Third Priority

Sustainability requires a population that is aware of the goals of a sustainable society and has the knowledge and skills to contribute to those goals. The need for an informed voting citizenry becomes ever more important with the increase in the

number of democratic governments. An informed voting citizenry, which lends support to enlightened policies and government initiatives, can help governments enact sustainable measures. Citizens also need to be knowledgeable consumers who can see beyond the “green wash” (i.e., public-relations efforts that highlight the activities of corporations that are more environmentally responsible while ignoring or hiding the major activities that are not). In today's world, people are surrounded by media (e.g., television, radio, newspapers and magazines) and advertisements (e.g., bill boards, banners on World Wide Web sites, and logos on clothing). As a result, people must become media literate and able to analyze the messages of corporate advertisers. Years of resource management has shown that a public that is aware of and informed about resource-management decisions and programs can help achieve program goals. On the contrary, an uninformed public can undermine resource-management programs. Education has also been essential in many other types of programs, such as public-health efforts to stop the spread of specific diseases.

Training - The Fourth Priority

The world needs a literate and environmentally aware citizenry and work force to help guide nations in implementing their sustainability plans. All sectors - including business, industry, higher education, governments, nongovernmental organizations (NGOs), and community organization – are encouraged to train their leaders in environmental management and to provide training to their employees. Training is distinct from education in that training is often specific to a particular job or class of jobs. Training teaches workers how to use equipment safely, be more efficient, and comply with regulations (e.g., environmental, health, or safety). For instance, a training program might teach workers to avoid changing the waste stream without notifying their supervisor. Further, if an employee is involved in a nonroutine activity, such as cleaning a new piece of equipment, she or he is instructed not to dispose of the cleaning solvent by pouring it down a storm sewer drain that leads to a river. Training informs people of accepted practices and procedures and gives them skills to perform specific tasks. In contrast, education is a socially transforming process that gives people knowledge, skills, perspectives, and values through which

they can participate in and contribute to their own well-being and that of their community and nation.

Formal, Nonformal, and Informal Education

For a community or a nation, implementing education for sustainability is a huge task. Fortunately, formal education does not carry this educational responsibility alone. The nonformal educational sector (e.g., nature centers, nongovernmental organizations, public health educators, and agricultural extension agents) and the informal educational sector (e.g., local television, newspaper, and radio) of the educational community must work cooperatively with the formal educational sector for the education of people in all generations and walks of life. Because education for sustainability is a lifelong process, the formal, nonformal, and informal educational sectors should work together to accomplish local sustainability goals. In an ideal world, the three sectors would divide the enormous task of education for sustainability for the entire population by identifying target audiences from the general public as well as themes of sustainability. They would then work within their mutually agreed upon realms. This division of effort would reach a broader spectrum of people and prevent redundant efforts.

2.7. How education can contribute to environmental conservation

Education encourages individuals to protect the environment. People with more education tend not only to be more concerned about the environment, but also to engage in actions that promote and support political decisions that protect the environment. Such pressure is a vital way of pushing governments towards the type of binding agreement that is needed to reduce greenhouse gases and control emission levels. In almost all countries participating in the 2010 International Social Survey Programme, respondents with more education were more likely to have signed a petition, given money or taken part in a protest or demonstration, in relation to the environment, over the past five years. In Germany, while 12% of respondents with less than secondary education had taken such political action, the share rose to 26% of those with secondary education and 46% of those with tertiary education.

An analysis of the Global Warming Citizen Survey in the United States also showed that the higher a respondent's education level, the greater his/her activism in terms of policy support, environmental political participation and environment-friendly behaviour.

Education encourages people to use energy and water more efficiently and recycle household waste. By increasing awareness and concern, education can encourage people to reduce their impact on the environment through more efficient use of energy and water supplies, especially in areas of resource scarcity. In semi-arid areas of China, for example, educated farmers were more likely to use rainwater harvesting and supplementary irrigation technology to alleviate water shortages.

Educated households are also more likely to use different methods of water purification through filtering or boiling. In urban India, the probability of purification increased by 9% when the most educated adult had completed primary education and by 22% when the most educated adult had completed secondary education, even once household wealth is accounted for.

Such behavior becomes increasingly important as people in high income countries are called upon to modify their consumption and take other measures that limit environmental harm. In the Netherlands, the more educated tend to use less energy in the home, even taking account of household income. A study in 10 OECD countries found that more educated households tended to save water; similar findings were reported in Spain.

Education, however, is not a panacea. It must be supported with global political leadership. As it becomes increasingly clear how much human action has impacted environmental degradation and climate change, especially through the release of greenhouse gases, attention must turn to education and the need to tap its potential. We are all learners when it comes to the environment and better ways to protect it and the planet we inhabit. In this sense, the notion of lifelong learning is especially apt. This trend will be further supported by the new Sustainable Development Agenda, in which education for global citizenship and sustainable futures is explicitly prioritized in one of the new education targets.

And yet, we all know that it's difficult to change attitudes and practices overnight. Completing education courses, both formal and non-formal, takes time to complete.

Therefore, we must also see it as our responsibility to communicate what we think about these global issues to nation leaders. The multiple threats of environmental degradation and climate change have assumed an unprecedented urgency to which we are all obligated to respond.

2.8. How tourism can contribute to environmental conservation

The tourism industry can contribute to conservation through:

- **Financial contributions**

Tourism can contribute directly to the conservation of sensitive areas and habitat. Revenue from park-entrance fees and similar sources can be allocated specifically to pay for the protection and management of environmentally sensitive areas. Special fees for park operations or conservation activities can be collected from tourists or tour operators.

- **Contributions to government revenues**

Some governments collect money in more far-reaching and indirect ways that are not linked to specific parks or conservation areas. User fees, income taxes, taxes on sales or rental of recreation equipment, and license fees for activities such as hunting and fishing can provide governments with the funds needed to manage natural resources. Such funds can be used for overall conservation programs and activities, such as park ranger salaries and park maintenance.

- **Improved environmental management and planning**

Sound environmental management of tourism facilities and especially hotels can increase the benefits to natural areas. But this requires careful planning for controlled development, based on analysis of the environmental resources of the area. Planning helps to make choices between conflicting uses, or to find ways to make them compatible. By planning early for tourism development, damaging and expensive mistakes can be prevented, avoiding the gradual deterioration of environmental assets significant to tourism. Cleaner production techniques can be important tools for planning and operating tourism facilities in a way that minimizes their environmental impacts. For example, green building (using energy-efficient and non-polluting construction materials, sewage systems and energy sources) is an

increasingly important way for the tourism industry to decrease its impact on the environment. And because waste treatment and disposal are often major, long-term environmental problems in the tourism industry, pollution prevention and waste minimization techniques are especially important for the tourism industry. A guide to sources of information on cleaner production (free) is available [here](#).

- **Environmental awareness raising**

Tourism has the potential to increase public appreciation of the environment and to spread awareness of environmental problems when it brings people into closer contact with nature and the environment. This confrontation may heighten awareness of the value of nature and lead to environmentally conscious behavior and activities to preserve the environment. If it is to be sustainable in the long run, tourism must incorporate the principles and practices of sustainable consumption. Sustainable consumption includes building consumer demand for products that have been made using cleaner production techniques, and for services - including tourism services - that are provided in a way that minimizes environmental impacts. The tourism industry can play a key role in providing environmental information and raising awareness among tourists of the environmental consequences of their actions. Tourists and tourism-related businesses consume an enormous quantity of goods and services; moving them toward using those that are produced and provided in an environmentally sustainable way, from cradle to grave, could have an enormous positive impact on the planet's environment.

- **Protection and preservation**

Tourism can significantly contribute to environmental protection, conservation and restoration of biological diversity and sustainable use of natural resources. Because of their attractiveness, pristine sites and natural areas are identified as valuable and the need to keep the attraction alive can lead to creation of national parks and wildlife parks.

- **Alternative employment**

Tourism can provide an alternative to development scenarios that may have greater environmental impacts. The Eco-escuela de Espanol, a Spanish language school created in 1996 as part of a Conservation International project in the Guatemalan village of San Andres, is an example. The community-owned school, located in the

Maya Biosphere Reserve, combines individual language courses with home stay opportunities and community-led eco-tours. It receives around 1,800 tourists yearly, mostly from the US and Europe, and employs almost 100 residents, of whom around 60% were previously engaged in mostly illegal timber extraction, hunting or slash-and-burn agriculture. Careful monitoring in 2000 has shown that, among the families benefiting from the business, the majority has significantly reduced hunting practices, and the number and extension of "slash-and-burn" agricultural plots. Furthermore, as most families in the village benefit directly or indirectly from the school, community-managed private reserves have been established, and social pressure against hunting has increased.

- **Regulatory measures**

Regulatory measures help offset negative impacts; for instance, controls on the number of tourist activities and movement of visitors within protected areas can limit impacts on the ecosystem and help maintain the integrity and vitality of the site. Such limits can also reduce the negative impacts on resources.

Limits should be established after an in-depth analysis of the maximum sustainable visitor capacity. This strategy is being used in the Galapagos Islands, where the number of ships allowed to cruise this remote archipelago is limited, and only designated islands can be visited, ensuring visitors have little impact on the sensitive environment and animal habitats.

2.9. Pilot educational actions for the sustainable cultural ecosystem services development- It all starts in the classroom

Eco-Schools is a growing phenomenon, which encourages young people to engage in their environment by allowing them the opportunity to actively protect it. It starts in the classroom, it expands to the school and eventually fosters change in the community at large. Through this programme, young people experience a sense of achievement at being able to have a say in the environmental management policies of their schools, ultimately steering them towards certification and the prestige which comes with being awarded a Green Flag. The Eco-Schools programme is an ideal way for schools to embark on a meaningful path towards improving the environment in both the school and the local community while at the same time

having a life-long positive impact on the lives of young people, their families, school staff and local authorities.

Includes everyone

Combining learning with hands-on experiences, the whole programme is run according to an all-inclusive, participatory approach involving students, teachers and the local community at large.

Improves School Environments

The Eco-Schools programme is an ideal way for schools to embark on a meaningful path towards improving the environmental footprint of a school, a change which inevitably leads to a more sustainable, less costly and more responsible school environment.

Motivates

Eco-Schools challenges students to engage in tackling environmental problems at a level where they can see tangible results, spurring them on to realize that they really can make a difference.

Improves Attitudes

Eco-Schools instills in students a sense of responsibility and cultivates a sustainable mindset which they can apply on a daily basis. It equips those involved with the drive to really make a difference and to spread such proactive behavior amongst family and friends, ultimately passing it on to future generations.

Involves Communities

Eco-Schools places great emphasis on involving the local community from the very beginning. By doing so, the lessons the students pick up are transferred back into the community where they take hold and lead to more sustainable, environmentally responsible behavior patterns all round.

Connects Globally

Eco-Schools facilitates contact between participating institutions not just at the national level, but also internationally. These links provide an opportunity for schools to share environmental information, they can also be used as a means for cultural exchanges and for improving language skills.

How Eco-schools works

The Eco-Schools programme consists of three structural elements - The Seven Steps Framework, the Eco-Schools Themes, and Assessment for the Green Flag. To be successful the programme requires support from school leaders and the Board. Active involvement of staff is imperative as well as long-term commitment and the willingness to involve students in decision-making.



Fig 2

FEE EcoCampus

As the students grow, the programme grows with them. When students began third level education in various countries, they wanted to join the Eco Committee only to discover that there wasn't one! So they approached the chancellors or deans to ask why. Some visionary university faculty and staff agreed to run the Eco-Schools programme with the help of our National Operators and it became known as FEE EcoCampus. It began in Russia in 2003 and the first whole institution Green Flags were awarded in Ireland in 2010.

Educational Principles

The Foundation for Environmental Education, has agreed upon eight principles to guide work towards excellence in Environmental Education/Education for Sustainable Development:

- Ensure that participants are engaged in the learning/teaching process
- Empower participants to take informed decisions and actions on real life sustainability issues
- Encourage participants to work together actively and involve their communities in collaborative solutions
- Support participants to examine their assumptions, knowledge, and experiences, in order to develop critical thinking, and to be open to change
- Encourage participants to be aware of cultural practices as an integral part of sustainability issues
- Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other
- Continuously explore, test, and share innovative approaches, methodologies, and techniques
- Ensure that continuous improvements through monitoring and evaluation are central to our programme.

Seven steps towards an eco-school The Eco-Schools

Seven Steps methodology is a series of carefully engineered measures to help schools maximize the success of their Eco-School ambitions. The method involves a wide diversity of individuals from the school community - with students playing a primary role in the process. The most important aspect for schools to remember is that every school is different and it is therefore critical that a school fits the seven steps around its circumstances and situation and NOT try to fit the school into the seven steps. Some key points about the individual steps are below.

Step 1: Form an Eco Committee

The Eco-Schools Committee is the driving force behind the Eco-Schools process and will represent the ideas of the whole school. It is student-led The Eco Committee

ensures that the entire school knows about Eco-Schools and will receive regular updates Composition can be: Students/Teachers/The Principal/Non-Teaching Staff (e.g. Secretary, Caretaker, Cleaner)/Parents/Members of the Board of Management/interested and relevant members of the wider community The Eco Committee meets regularly to discuss environmental actions for the school

Step 2: Carry out an Environmental Review

Carrying out an environmental review helps the school to identify its current environmental impact and highlights the good, the bad and the ugly. The aim is to investigate the environmental issues in your school/community. All 10 main themes should be reviewed annually (the school is free to choose other areas of environmental concern that are more relevant to its needs and to devise appropriate checklists accordingly. Make sure that the wider school community works as closely as possible with the Eco Committee to carry out the Review. It is essential that as many pupils as possible participate in this process. The results of your Environmental Review will develop your Action Plan.

Step 3: Action Plan

The Action Plan is the core of your Eco-Schools work and should be developed using the results of your Environmental Review. Use the Environmental Review to identify the priority areas in your school. To keep it manageable we suggest focusing on not more than three Themes at a time. Create an Action Plan to resolve or improve those problems. It should include: the necessary tasks, the people responsible and time frame for actions in order to achieve your goals/targets. Make your action plan SMART (specific, measurable, attainable, realistic and timely). As with every aspect of the Eco-Schools process, pupils should be involved as much as possible in the drawing up of the Action Plan.

Step 4: Monitor and Evaluate

To find out whether or not you are successfully achieving the targets set out in your Action Plan, you must monitor and measure your progress. As always, pupils should be given the responsibility for carrying out monitoring activities wherever possible. Results of monitoring should be regularly updated and displayed for the whole school to see The monitoring methods that you use will depend on the targets and measurement criteria decided on in your Action Plan for the topics you wish to look

at and the age and ability of the pupils and other individuals who carry it out. Evaluation follows on from monitoring. Evaluating the success of your activities will allow you to make changes to your Action Plan if required.

Step 5: Curriculum Work

Besides increasing the status of the programme, linking Eco-Schools activities to the curriculum ensures that Eco-Schools is truly integrated within the school community. Integrating the programme into the curriculum can be done, either directly through science, civics and environmental classes or indirectly in other subject areas through innovative teaching. Pupils from throughout the school should gain an understanding of how real life environmental issues are dealt with in a real life setting.

Step 6: Inform and Involve

Getting everyone on board! Actions should not just be confined to the school: for example, pupils should take home ideas to put into practice. It is essential that the whole school is involved in, and the wider community aware of, the schools' Eco-Schools programme. Means of information provision and public relations to tell about their work can include: school assemblies, school notice boards, school newsletters and websites, school plays, dramas and fashion shows based on environmental issues, letters to businesses and corporations, local and national press, radio and television, etc. Global Action Days.

Step 7: Produce an Eco Code

A statement that represents the school's commitment to the environment. It should be memorable and familiar to everyone in the school. The format is flexible, it can be a song, drawing, model, poem, etc. The Eco-Code should list the main objectives of your Action Plan. It is crucial that pupils play a key role in the development of the Eco Code, as this will give them a greater sense of responsibility towards the values the Eco Code represents. The content of the Eco Code should be reviewed on a regular basis to ensure that it continues to reflect the school's ecological aims and targets.

The Eco Code should be prominently displayed throughout the school. The Green Flag. Usually after two years of implementing the programme and reaching a high level of performance in complying with these seven steps (sometimes national mandatory criteria also applies), schools can then apply for and be awarded the Green Flag. Before receiving their first Green Flag, schools must be assessed by

means of a visit. After the first Green Flag, other means of assessment are allowed, although visits are always recommended. Assessment should be carried out on a yearly basis.

2.10. Guidelines for Schools to join in international networks and education programs regarding sustainable ecosystem services

There are several opportunities for schools to join in international initiatives in order to obtain knowledge and enrol in environmental education programs.

Eco schools www.ecoschools.global/

Eco-Schools is a growing phenomenon, which encourages young people to engage in their environment by allowing them the opportunity to actively protect it. It starts in the classroom, it expands to the school and eventually fosters change in the community at large. Through this programme, young people experience a sense of achievement at being able to have a say in the environmental management policies of their schools, ultimately steering them towards certification and the prestige which comes with being awarded a Green Flag. The Eco-Schools programme is an ideal way for schools to embark on a meaningful path towards improving the environment in both the school and the local community while at the same time having a life-long positive impact on the lives of young people, their families, school staff and local authorities.

World Wildlife Fund (WWF)

Brief History : World Wildlife Fund was conceived in April, 1961 and H.R.H Prince Bernhard of the Netherlands was the organization's first president. World Wildlife Fund was established to create an international fundraising organization to work in collaboration with other conservation groups and bring substantial financial support to the conservation movement on a worldwide scale.

Achievement : From its origins as a small group of committed wildlife enthusiasts, WWF has grown into one of the world's largest and most respected independent conservation organizations – supported by 5 million people and active in over 100 countries on five continents. Over this time, WWF's focus has evolved from localized

efforts in favor of single species and individual habitats to an ambitious strategy to preserve biodiversity and achieve sustainable development across the globe.

Fauna & Flora International (FFI)

Brief History: Established over a century ago, Fauna & Flora International (FFI) was the world's first international conservation organization. The pioneering work of its founders in Africa led to the creation of numerous protected areas, including Kruger and Serengeti National Parks. FFI has always been a groundbreaker; it is renowned for its innovative, landmark programmes, many of which have come to be regarded as classic examples of conservation practice. **Achievements:** Fauna & Flora International (FFI) is making a real difference to the planet's biodiversity. By finding where they are needed most and forming successful partnerships, they have managed to save some of the world's most beautiful, fascinating and threatened wildlife and ecosystems. In total FFI is directly influencing the conservation of over 13.5 million hectares of important conservation lands and sea. Their support for habitat protection around the world is helping to create safe havens where biodiversity can flourish. Some of their success stories included Mountain Gorilla Conservation, Primates in Vietnam and China, Mpingo Tree Certification and Natural Value Initiative.

United Nation Environment Programme (UNEP)

Brief History : UNEP was established after the 1972 UN Conference on the Human Environment, held in Stockholm, Sweden, proposed the creation of a global body to act as the environmental conscience of the UN system. In response, the UN General Assembly adopted Resolution 2997 on 15 December, 1972 creating: the UNEP Governing Council, composed of 58 nations elected for four-year terms by the UN General Assembly, responsible for assessing the state of the global environment, establishing UNEP's programme priorities, and approving the budget; the UNEP Secretariat, to provide a focal point for environmental action and coordination within the UN system; and a voluntary Environment Fund to finance UNEP's environmental initiatives, to be supplemented by trust funds and funds allocated by the UN regular budget. **Achievements :** The United Nations has spearheaded an

international effort to combat global environmental problems such as a thinning ozone layer, global warming, and unsustainable development. The UN system provides international assistance with annual loans and grants for developing countries and countries in economic transition. It includes the United Nations Environmental Programme (UNEP) 1972, which has adopted strategies in order to curb the depletion of natural resources, support alternative energy, and protect and preserve the environment.

Conservation International

Brief History : Conservation International was founded in 1987 in hopes of analyzing the problems most dangerous or harmful to nature and building a foundation dedicated to solving these issues on a global scale. This foundation is built on detecting the problems most threatening to nature, making sure the institution is doing the best they can in preventing the industry side of the world in playing a hand in being detrimental to nature, and lastly making sure all the knowledge the institution has acquired over the last twenty five years is being shared with governments and in doing so establishing policies within these countries that serve as a great benefit to the people and nature. **Achievements** : The mission of Conservation International is to build upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity. The vision of CI is to imagine a healthy, prosperous world in which societies are forever committed to caring for and valuing nature, for the long-term benefit of people and all life on Earth.

International Union for Conservation of Nature and Natural Resources (IUCN)

Brief History : IUCN was founded in 1948 as the world's first global environmental organization and is the largest professional global conservation network today. IUCN is a leading authority on the environment and sustainable development with more than 1,200 member organization including 200+ government and 900+ non-government organizations. IUCN's work is supported by over 1,000 staff in 45 offices and hundreds of partners in public, NGO and private sectors and thousands of field projects and activities have been carrying out around the world

round the world. The Union's headquarters are located in Gland, near Geneva, in Switzerland. IUCN is governance by a council elected by member organizations every four years at the IUCN World Conservation Congress. **Achievements:** IUCN's work focuses on valuing and conserving nature, ensuring effective and equitable governance of its use, and deploying nature-based solutions to global challenges in climate, food and development. IUCN supports scientific research, manages field projects all over the world, and brings governments, NGOs, the UN and companies together to develop policy, laws and best practice. IUCN is the world's oldest and largest global environmental organization, with more than 1,200 government and NGO Members and almost 11,000 volunteer experts in some 160 countries. IUCN's work is supported by over 1,000 staff in 45 offices and hundreds of partners in public, NGO and private sectors around the world.

International Crane Foundation (ICF)

Brief History: The International Crane Foundation (ICF) was established by founders George Archibald and Ron Sauvey in 1973 on a horse farm in Baraboo, Wisconsin.

Achievement: Over the past 40 years, ICF has developed unique collaborations and led effective community-based conservation programs, important research projects and innovative captive breeding and reintroduction efforts. These efforts have inspired international cooperation, helped improve livelihoods for people around the world, and lead to the protection of millions of acres of wetlands and grasslands on the five continents where cranes live.

Wildlife Conservation Society (WCS)

Brief History: The Wildlife Conservation Society was established in 1895 as the New York Zoological Society. Its mission was, and is, to promote wildlife protection, foster the study of zoology and create a top-notch zoo. **Achievement:** NYC Temporary Employment; From March through October, WCS employs full and part-time temporary staff in guest service, food service, retail sales, membership sales, telephone sales, animal exhibits, and maintenance.

Oceana

Brief History: Oceana was established in 2001 by a group of leading foundations — The Pew Charitable Trusts, Oak Foundation, Marisla Foundation (formerly Homeland Foundation), and the Rockefeller Brothers Fund.

Achievements: To fill the gap, our founders created Oceana: an international organization focused solely on oceans, dedicated to achieving measurable change by conducting specific, science-based campaigns with fixed deadlines and articulated goals. The Ocean Law Project — also initiated by The Pew Charitable Trusts — was absorbed into Oceana in 2001 as Oceana's legal arm. In 2002, Oceana merged with American Oceans Campaign, founded by actor and environmentalist Ted Danson, to more effectively address our common mission of protecting and restoring the world's oceans. Since its founding, Oceana has won more than 100 victories and protected more than one million square miles of ocean.

3 Guidelines-Recommendations for conservation and sustainable capitalization of ES under study

Specific legal frameworks are needed for conservation and sustainable capitalization of ES. Legal framework should address the various aspects of sustainable development such as forestry, agriculture, transportation, culture, education, health, economy, environment, biodiversity, tourism and mining. The legal framework should:

- Respect the cultures protect the rights promote the well being and ensure the participation of the local communities
- Provide suitable mechanisms for conflict and dispute settlement in in protected areas
- Promote and facilitate bilateral and multilateral cooperation

Furthermore, sustainable capitalization of biodiversity and its services should take into consideration the following criteria their purpose is to pinpoint what issues are of foremost importance for improving the sustainability of harvesting operations

Criterion 1: Reforestation and Productive Capacity

Criterion 2: Land Use Change and Greenhouse Gas Reduction

Criterion 3: Biodiversity Conservation

Criterion 4: Soil Quality and Erosion Prevention

Criterion 5: Hydrologic Processes, Water Quality and Supply

Criterion 6: Profitability

Criterion 7: Community Benefits

Criterion 8: Stakeholder Participation

In addition specific guidelines for sustainable tourism development in protected areas are being provided here as all park systems require a tourism policy. A few general policies that are applicable across a broad range of situations are as follows:

1. Strong links between private tourism businesses and protected area systems are necessary. Representatives from all sectors need to work together to develop sustainable forms of tourism for protected areas.
2. Integrate environmental concerns into national and regional tourism policies and projects. Sustainable nature-based tourism needs to be made a fundamental part of government policies relating to tourism.
3. Establish and implement national strategies for sustainable tourism that identify current opportunities and gaps.
4. Tourism development in and around protected areas should only occur if it is ecologically, culturally, socially and financially sustainable in the long term.
5. The private tourism sector should assist in maintenance of the natural and cultural resources of the protected area on which it depends.
6. Senior governments should develop national strategies and policies that place protected areas and their surroundings into a larger land-use planning context. Protected areas also need to be placed within an economic strategy and a tourism strategy.
7. For efficient management, it is necessary to have competent systems of tourism information collected by the protected areas' management. Systems should be compatible between different areas (i.e., collect data for the same units of scale). Jurisdictions should all possess standard definitions for key elements of a park tourism statistical program.
8. All park systems require a public use and tourism policy as well as a legal structure that enables the policy to be implemented. Review existing legislation to make sure it is compatible with sustainability goals, and make adjustments as

necessary. Ensure that written instruments that provide a legally enforceable framework are in place (e.g., laws, governmental policies, and property rights).

9. Further development of networking systems for parks and protected area managers to discuss issues and related management options and solutions is desired. Better information channels are needed to enable experiences to be shared.
10. Governments should encourage and support the conservation of nature and culture as the major resources for tourism, and provide policies, plans and a legal framework for carefully controlling tourism so that it brings substantial benefits without generating serious problems.
11. The tourism industry should emphasize general policies and strategies, major development plans and programs and marketing. More specifically, they can establish policies, laws and incentives for socially conscious tourism. Strong links between private tourism businesses and protected area systems are necessary. Representatives from all sectors need to work together to develop sustainable forms of tourism for protected areas.
12. Governments, protected area managers, and tourism sector staff should utilize the 15-item sustainable tourism action plan checklist to guide sustainable tourism development in and around protected areas.
13. A sustainable tourism action plan should be created for each protected area. This should be done in consultation with the tourism sector and the local communities. This tourism plan should be part of the overall park management plan that all protected areas must have for successful long term planning and management to occur. Conservation and tourism objectives for each protected area need to be identified.
14. Compile an inventory of each site's natural and cultural characteristics, as well as existing and potential tourism opportunities. Park managers should use hands-on knowledge and scientific research to develop an understanding of visitors' needs, expectations, behaviors and characteristics.
15. The value of involving local people in planning and protection activities is enormous and should be viewed as a necessity. Park managers should make efforts to have ongoing contact and good working relations with local

communities. Promote domestic capacity for participation in management of the protected area and enable benefits to be distributed to local areas.

- 16.** All stakeholders associated with tourism in parks and protected areas should examine and pursue possible partnership opportunities that bring about greater sum benefits than when working alone.
- 17.** Zoning should be used in the planning process to identify areas which are best suited for higher use levels along with the range of appropriate use levels for the areas of the site.
- 18.** Limits of acceptable use should be part of the management plan for each site. Managers of protected areas must use all available information and professional judgement to develop levels of acceptable use for their areas. Once levels of acceptable use are established, desired standards to be maintained through sustainable tourism need to be identified. The degree to which these standards are maintained needs to be monitored regularly.
- 19.** Requirements to set limits of acceptable use should be embodied in protected area legislation. Managers of protected areas should have the power to act quickly if inappropriate activities are occurring to prevent or reduce damage that may be caused.
- 20.** All parks and protected areas should use visitor management methods such as zoning, visitor channeling, education, interpretation and policy enforcement to ensure that tourism levels and impacts remain within acceptable limits established for the area. A monitoring program should be established to evaluate the success of these management tools. Indicate how often evaluations will occur and how revisions will be incorporated when necessary.
- 21.** All park agencies should support development and additions to environmental education and interpretation programs. Through such programs visitors and local people increase their understanding and appreciation of the area's environmental and cultural features. Scientific research can be applied to the development of these programs.
- 22.** All proposals for tourism development in or near protected areas should be subject to an environmental, social, cultural and economic assessment. Whenever possible, large-scale tourism developments should not be located in

and around protected areas. Carefully consider small-scale tourism development proposals in the context of conservation and tourism objectives of the protected area, appropriate zoning and desirability. Create or refine a formal evaluation process that can be used to assess tourism development proposals.

- 23.** Protected area agencies and staff should learn and apply concepts of market research and product development to management. Ideally, at least one staff person within the agency should possess marketing expertise. Another option is to build partnerships with other organizations or agencies whose staff can provide this type of input.
- 24.** Sufficient resources and training are needed to encourage the development of sustainable tourism, to repair existing damage, and to develop visitor management. All parks should assess resource needs and sources. All protected area agencies need to train and hire individuals who possess skills related to tourism competencies. Each protected area should have staff people who possess specialized training in visitor and tourism management.
- 25.** Both ecolabels and codes of conduct are aimed at improving environmental performance within the tourism industry, in all sectors (e.g., private companies, government agencies, visitors, etc.), and therefore should be further encouraged and supported.
- 26.** Incorporate any special considerations related to protected area management of fragile high-altitude environments.
- 27.** Recreation groups, such as divers or mountain climbers, can often be key allies in alpine and marine area conservation. Park managers should make special effort to work cooperatively with such groups.
- 28.** Confirm and improve the comprehensive design and effective management of a representative system of marine protected areas.
- 29.** Continuing human use within and adjacent to marine protected areas should play a role in the selection, design and management of marine protected areas. The framework provided by UNEP's Regional Seas Programmes encourages regional integrated planning for the use and protection of large marine ecosystems.

- 30.** Marine conservation is often poorly understood by the public. Therefore, high levels of marine conservation education needs to be provided in all marine conservation areas.
- 31.** Many countries in the world are encountering similar challenges with marine and alpine conservation. Park agencies should encourage their managers to establish and maintain contacts with park managers in other countries that have similar conservation challenges. Such contacts can be invaluable for the exchange of valuable management experiences.
- 32.** Sustainable tourism practice is a long term commitment. Think long term, but also set realistic short and mid-term goals to be accomplished. Individuals, businesses and organizations must be aware that benefits are long term. Do not expect to experience benefits immediately once the first efforts to establish sustainable practices are implemented. Instead, expect to experience only a small portion of benefits soon after tourism development, and larger portions of benefits only after three or four years of continued effort.
- 33.** Develop a Checklist for Developing a Sustainable Tourism Action Plan for Protected Areas. However, do not think of sustainable tourism as a checklist where items can be checked off and not referred to again. Instead, think of it as a never ending dance that revisits the same important elements to the process time and time again
- 34.** Develop incentive measures that will influence the decision-making process. Create inducements that are specifically intended to motivate government, local people, and international organizations to conserve biological and cultural diversity. Review existing legislation and economic policies to identify and promote incentives for the conservation and sustainable use of the resources, stressing removal or mitigation on incentives that threaten biological diversity.
- 35.** Make ongoing efforts to communicate with all stakeholders, including government agencies, tourism organizations, non-profit organizations, private businesses, and other interested parties.
- 36.** International organizations need to encourage governments to make improvements in the following critical areas: • Support for effective legislation, with adequate resources for implementation • Development of a management

plan for each protected area, covering all activities, including tourism, to ensure that objectives are achieved and resources are well used • Creation of national policies on protected areas and the management of tourism (as well as education about the environment and conservation).

- 37.** Invest and assign some tourism revenue to local communities, so that local people see direct financial benefits from park tourism.
- 38.** Allocate sufficient funds for effective planning and management of protected areas, including the management of tourism. A professional management team should be in place, with funding, before the area is opened to tourism.
- 39.** Ensure every protected area has a realistic budget.
- 40.** Encourage creative and innovative methods for raising revenue for protected areas.

4 Conclusions and recommendations

4.1 Status- Obstacles and opportunities

The BIOPROSPECT project aim is to explore and document the ecosystem of forested protected areas and the ways of sustainable capitalization as a mean for their wise management and conservation. In this report we mainly focused on Guidelines for sustainable capitalization of cultural services related to education and social inclusion. Tourist service is the major cultural service of a protected area at the same time is the world's largest and fastest growing sector of the global economy. The World Tourism Organization (WTO) is the tourism industry's most comprehensive collector of tourism data. In 1999 WTO reported an estimated 657 million international tourist arrivals, which generated US\$455 billion world-wide (WTO, 2000a). In other words, the equivalent of roughly 10% of the world's population was transported internationally in 1999. Compared to 1950, when 25 million tourists generated US\$8 billion, there have been significant increases in both the volume of international travel and receipts generated. From the period of 1950 to 1999, tourism arrivals had an average annual growth rate of 7%. International tourism receipts (at current prices and excluding international transport costs) had an average annual growth rate of 12% over the same period (WTO, 2000a). The tourism

industry has been expanding and diversifying at a tremendous pace. Over the past three decades, international arrivals have grown steeply from 183 million in 1970, to 450 million in 1991, with figures expected to reach over 670 million by the year 2000. It has been predicted that there will be approximately 937 million international tourist arrivals in 2010 (WTO, 1994). Domestic tourism is increasing as well, although numbers are difficult to report, since collection methods vary. Domestic tourism is not included in these international arrival figures. The value of domestic tourism is several times larger than international tourism. Tourism is the world's largest industry, generating a larger gross dollar output than any other single industry (e.g., it is bigger than the automotive, electronic and agricultural industries). In 1998 the international tourism and international fare receipts (the receipts related to passenger transport of residents of other countries) together accounted for roughly 8% of the world's total export earning on goods and services (WTO, 2000a). Total international tourism receipts, including the international fare component, amounted to an estimated US\$532 billion in 1998, putting it ahead of all other categories of international trade (WTO, 2000a). The ever-increasing importance of the economics of tourism has captured the attention of policy makers in many countries in the world. Tourism is now an integral part of the global economy. For many people travel is easy, fast and relatively cheap. Travel and tourism is the world's largest employer. According to the World Travel and Tourism Council (WTTC), tourism supports 200 million jobs world-wide, which represents 8% of total employment or 1 in every 12.4 jobs (WTTC, 2000). Tourism generates 11% of the world gross domestic product (GDP), 8% of total employment, and 5.5 million new jobs per year until 2010 (WTTC, 2000). By 2010 the WTTC forecast predicts that travel and tourism will grow to account for 11.6% (or US\$6.591 billion) of the global GDP and support 250 million jobs (9% of total employment or one in every 11 jobs). Not only is the overall travel market increasing, but vacation travel to national parks and other types of protected areas is also increasing. Recognition of the importance of tourism within the field of sustainable development, along with increased world-wide interest in environmental issues, have helped contribute to the need for the creation of sustainable tourism principles. However, it is important to note that this vast increase in travel is dependent upon inexpensive energy. If the costs of energy,

and most importantly of oil and gas, increase significantly, the volume of travel will be reduced accordingly.

The establishment of special protected areas by society has been a cultural phenomenon for centuries. Such sites have many names, but typically they involve the creation by government authorities of special designations for historic or ecological protection, and of special management institutions governing site use by people. In many cases, travel to the sites by people have created the initial impetus for site designation and protection. Travel to experience protected areas has been an integral part of park operations for a very long time. As visitor numbers grow so do the management challenges. Two changes in recent years are an increased recognition of the importance of ecological protection, and the need for specialized management of the impacts caused by visitors. There are many driving forces behind tourism flows and volumes in parks. These include factors such as increasing wealth, changing attitudes toward the environment, technological evolution, economic restructuring, and civil unrest. These influence visitation to parks. Parks and protected areas offer ecological, educational, recreational, scientific, economic and cultural benefits to domestic and international visitors, surrounding communities and society in general. Because people benefit from these areas, some people will want to be involved in decisions related to their establishment and management. They will want to be able to express their opinions about how the area should be managed. Many will want conditions that help individuals to experience the benefits of the protected area. Individuals and organization who have a direct interest in or are affected by park and tourism management policies are called stakeholders. For effective management and sustainable tourism to occur, protected area managers must involve stakeholders in the management process at the earliest stages possible. Management of tourism in parks and protected areas is influenced primarily by three major stakeholder groups with interests in the areas: a) tourism operators and park managers, b) visitors and other users, and c) society. Each group views tourism from its own unique perspective. An effective and comprehensive management plan for a park must incorporate an understanding and appreciation of the perceptions of each of these groups. Failure to recognize and address all of the driving forces of

tourism will result in short-sighted management that only considers a portion of potential stakeholders.

However, there are still obstacles regarding the development of sustainable ecosystem services in the area of cultural services named below.

- Land tenure rights, governance and security are uncertain: The lack of or absentee ownership means fragmented responsibility and undermines long-term visions, reducing opportunities to manage price volatility in the supply chain.
- There is a lack of data demonstrating the links between wild nature and certain commodities: Although biodiversity research and knowledge around species abundance and distribution is growing, much research is still needed around the interactions between wild nature and certain commodities.
- There is a lack of simplified biodiversity metrics: Businesses require metrics which are credible, practical to use, easy to understand and relevant of their industry.
- Biodiversity decline and ecosystem degradation reduce resilience
- Increased demand for agricultural land
- Discrepancy between protected area management authorities and developing authorities
- The impacts of climate change on ecosystems and society call for adaptation measures
- The objectives of the conservation or the development are not carefully defining
- The the natural resources base and ecosystems is not well understood
- Lack of funds
- Habitat degradation and fragmentation
- Pollution
- Overharvest
- Invasive species and disease

4.2. Potential for improvement and remaining challenges

Radical transformations will be required to move from conceptual frameworks and theory to practical integration of ecosystem services into decision-making, in a way that is credible, replicable, scalable, and sustainable. There remain many highly nuanced scientific challenges for ecologists, economists, and other social scientists to understand how human actions affect ecosystems, the provision of ecosystem services, and the value of those services. At least as demanding are the social and political challenges associated with incorporating this understanding into effective and enduring institutions, to manage, monitor, and provide incentives that accurately reflect the social values of ecosystem services to society. The candid analyses presented here help light the way.

Valuing social cohesion is difficult and it is almost impossible to judge the benefits of local community projects in economic terms. However, the interaction between neighbors and the ownership of a project are likely to have significant welfare benefits for the community. There are significant challenges to valuing small scale changes in ecosystem provision. Non –linearity in ecological systems can mean that changes over a small area can have either large impacts (where they for instance link up existing habitats) or very small impacts where they are isolated. However, significant benefits are gained from education and willingness to give up time for the project. These impacts are less affected by ecological non-linearities and are largely driven by the existence of the project rather than its environmental successes.

Although consensus on a coherent and integrated approach to ecosystem service assessment and valuation is still lacking, and empirical data is still scarce, efforts to fill these gaps have changed the terms of discussion on nature conservation, natural resource management, and other areas of public policy. It is now widely recognized that nature conservation and conservation management strategies do not necessarily pose a trade-off between the “environment” and “development” but that investments in conservation, restoration and sustainable ecosystem use generate substantial ecological, social and economic benefits.

Several issues follow from the recognition of the potential of the 'ecosystem service approach' to transform priorities of environmental management and related policy making. Some of these pertain to the practices and protocols of the ecosystem service approach itself. Although much has been achieved, there is a need to develop widely shared definitions of key concepts and typologies (of services, benefits, values), so that lesson learning and accumulation of results can be facilitated and fostered. For the same reasons, it is important to develop ecosystem services measurement and reporting practices and standards for ecological socio-cultural and economic values which are robustly based on an underlying conceptual framework and which are widely shared among the practitioners of the ecosystem service approach to ensure comparability and transferability. To achieve this kind of integrated approach presents many challenges both at the levels of theory and methods, as were highlighted in this paper. Although much remains to be done, the many ongoing projects and initiatives mentioned in this paper provide reason for optimism that the concept of Ecosystem Services will soon become main-stream in environmental planning and management at all levels of decision-making. To facilitate this process, recently the Ecosystem Services Partnership (ESP:www.es-partnership.org) has been launched to provide a platform for communication on research and practical implementation of the 'ecosystem services approach'.

Furthermore, two key improvements in the way we do science are needed to make progress here. First, more integrative collaboration across social sciences, natural sciences, and the humanities is required to address the challenges implied by the fact that ecosystem services are supplied and distributed by complex social ecological systems. This goes well beyond multi-disciplinary perspectives on the ecosystem services concept, and recognizes the need for truly integrated, trans disciplinary approaches to studying interactions between socio-economic and ecological systems. Second, the scientific community working on ecosystem service sciences alone cannot provide a full response to all of the key needs of policy makers and decision makers. Instead, we need coproduction of knowledge through research programmes designed in collaboration with decision makers and users of ecosystem services, to ensure that interventions and policies have appropriate impact and can operate across multiple temporal and spatial scales. In this sense, our knowledge

should integrate local and traditional knowledge with other sources of information, recognizing the diversity of modes by which multiple stakeholders and users interact with ecological systems. Building on the previous knowledge, the aim should be to advance research efforts responding to all three challenges through improved networking, information exchange, and codesign with both funders and stakeholders. A first step will be the further conceptual elaboration of the challenges and tasks mentioned above, guiding transdisciplinary research on ecosystem services in the next decade. Additionally, there is a considerable amount of scattered, but very good, ecosystem service science in existence. Using approaches that bring multiple academic disciplines and stakeholders together to better integrate this information into new knowledge about ecosystem services, will advance our ability to manage ecosystems for ecosystem services. Finally, while the urgency of better management of natural resources maybe selfevident to some, better communication is still essential for motivating advances in policy, as well as make a change to the impact of private actors' activities on the biophysical environment.

Action plan - Guidelines for ecosystem protection to be implemented by the authorities.

While the idea articulated above will not solve the environmental issues related to tourism, there are several initiatives in place to mitigate the negative externalities on the environment created by the mass tourism industry. For instance, the development of the ecotourism industry has benefitted economies across the world while also promoting the integrity of the natural environment. The International Ecotourism Society defines ecotourism as: "Responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" ("What Is Ecotourism?"). Ecotourism has several advantages over conventional tourism. First and foremost, it promotes local conservation efforts and raises awareness about the harmful effects of mass tourism. Ecotourism can also aid in the development of poorer countries by employing locals as guides and hosts and allowing them to supplement their

incomes. In addition, the involvement of locals in the industry often prevents a leakage of income out of the country to large multinational hospitality corporations. However, while ecotourism can empower local communities and promotes environmentally sustainable practices, the industry is not without flaws or downsides. Labeling areas as protected or demarking them as national parks can displace locals living in those areas and force them to move to unfamiliar, less economically and socially advantageous regions (Kennedy). For example, the Masai people in Kenya have been forced off of their traditional lands and now live just outside of the reserves. This land is inferior to the land inside of the parks, and the Masai have become tourist attractions for Westerners excited by their “primitive ways.” Patronizing practices like compensating people to dance or perform traditional rituals discourages the Masai from pursuing their culture and traditional style of life. Ecotourism can also intrude upon local ecosystems, and tourists often litter and perform other acts that can disrupt the ecology of a given area.

Experiencing unspoiled nature has become one of the most important leisure and holiday activities in our fast moving every-day-life in a mostly cemented surrounding. But what most people enjoy very easily and in different activity forms provides a barrier for those who have got a physical handicap either in mobility or perception. Those who are dependent to wheelchair fail at sandy or muddy paths as well as steps and stairs. Blind people do fail at only visually provided information and have severe difficulties to orientate themselves within nature or a building. For deaf people the audio information in communication situations, in guided tours and nature films is not accessible. Whereas people with limited cognitive skills cannot percept sophisticated language with many technical expressions. There are a large number of barriers for people with a handicap. For a long time conventional planning of goods and services took a “fictive average person” as basis. Public spaces do nowadays integrate solutions for particular handicaps. But what might be good for people in a wheelchair is not reasonable for deaf or visually impaired people. Against the background of an aging society it is not the special solution for specific groups of handicapped people that is needed but a planning that considers “accessibility for all”. This is the barrier free approach the partners of the Parks & Benefits project want to apply in

their actions - including the travel to and the mobility within protected areas. The partnership provides a perfect opportunity to develop and test blue print solutions of an improved infrastructure within the protected areas adapted to the needs of handicapped and elderly people. So when we think of sustainable development of protected areas in terms of visits and tourism at list the following infrastructures should be build based on the needs of major disabled groups of people

People who move in wheelchairs need:

- Firm, even surfaces providing level access (without level changes).
- Slopes that are not too steep, whenever they have to overcome level changes.
- Easy-to-open doors offering sufficient clear width.
- Sufficient space for passage and maneuvering. Furniture, equipment, etc at suitable heights. Lifts to overcome level differences inside buildings.
- Accessible toilets.
- Dedicated parking spaces close to main entrance

People with reduced mobility need:

- Handrails at stairs.
- Few stairs or stairs with few steps.
- Lifts to overcome level differences inside buildings.
- Short walking distances.
- Many resting places, so that they can sit down frequently.
- Firm, even surfaces providing level access (without level changes).
- Slopes that are not too steep, whenever they have to overcome level changes.
- Easy-to-open doors offering sufficient clear width.
- Sufficient space for passage.
- Furniture, equipment, etc at suitable heights.
- Dedicated parking spaces close to accessible entrance.

Visually impaired people need their surroundings to be laid out in such a way that it becomes easier for them to find their way and move around. For example:

- A simple, logical layout of indoor and outdoor environments.

- Tactile and visible markings by means of variations in materials, for example in the form of guiding lines and attention fields with surfaces that are distinctly different from other surfaces (tactile markings and the use of contrasting colours).
- Marking at the beginning and end of stairs and ramps by attention fields.
- Handrails at ramps and stairs.
- Marking of the front edges of steps.
- Marking of changes of direction, entrance doors and lifts by attention fields.
- Well-considered use of contrasting colours.
- Good non-glare lighting.
- Sound systems and tactile systems, eg embossed letters, to supplement visual/written information.

4.3. Increasing Awareness of the Interdependence of Nature and People.

Several efforts have enhanced broader general understanding of the fundamental linkage between ecosystems and human well-being and a number of examples state the importance of incorporating the value of nature in public and private arenas. In many cases, interest from decision-makers has created demand for information that has outstripped the supply from science. However, awareness of the interdependence of nature and people is not yet sufficiently widespread. Despite promising developments, such as the World Economic Forum's identification of environmental issues among the top 10 global risks for business, environmental issues still often rank low in public concerns. Most business and economic practices ignore natural capital. A major limitation of the current framing of natural capital is its perceived isolation from other forms of capital and the mainstream of economic and social activity. This isolation relegates considerations of natural capital and ecosystem services to ministries of the environment rather than finance, agriculture, and industry; to corporate sustainability departments rather than boardrooms; and to the rural poor populations rather than to the urban populations driving resource use.

Placing natural capital and ecosystem services into a broader decision-making context ([Fig. 3](#)) is necessary to effect large-scale transformations in policies,

practices, and investments. Such considerations are not only relevant to natural resource and conservation decisions, but also for health, agriculture, energy, water security, infrastructure, urban development, finance, and national security: arenas that extend well beyond classic conservation. Helping sectoral leaders understand these connections is critical. Societal decisions in these contexts would often be different if natural capital and ecosystem services considerations were incorporated

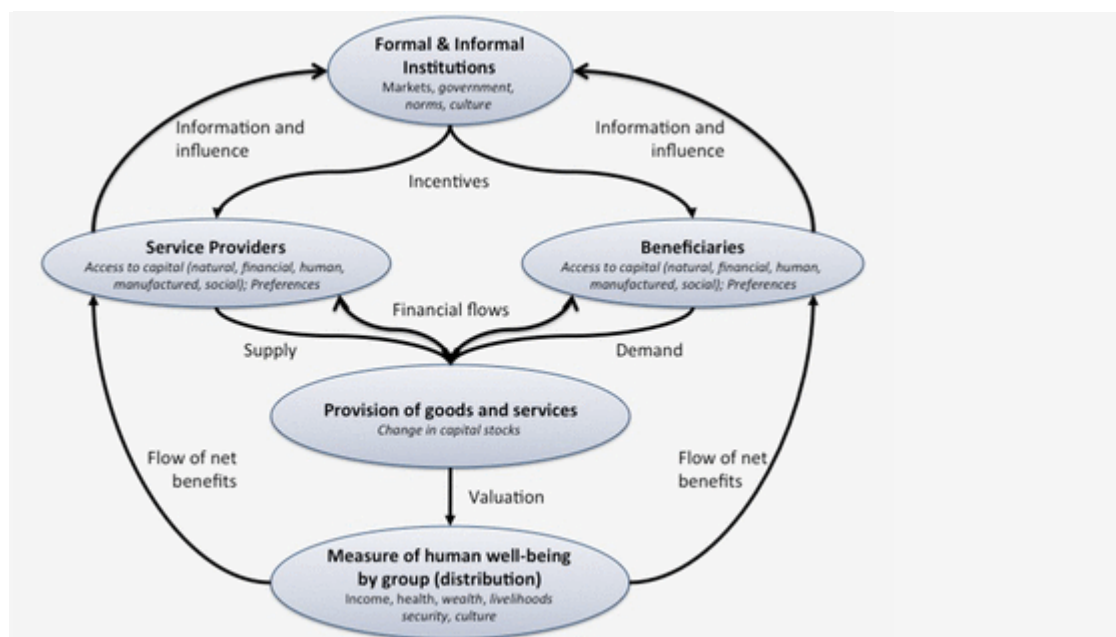


Fig. 3.

A framework for including natural capital in the broader context of formal and informal decision-making institutions along with other forms of capital: financial, human, manufactured, and social. Formal and informal institutions influence decisions by both service providers and beneficiaries. Access to various forms of capital (“capabilities”) and preferences affect the decisions of service suppliers and beneficiaries. The joint actions of service providers and beneficiaries determine the flow of goods and services (including ecosystem services). These change various capital stocks (including natural capital) and affect the well-being of different groups in society. Closing the loop from institutions to decisions to human well-being, and back to the top to inform institutional design and decision-making, has the potential to improve policy and management in ways that lead to improvements in human well-being. Components in *italics* indicate factors that change on relatively long timescales.

4.4. Advancing Science.

Advancing science and creating accessible tools for analysis and decision support can identify critical natural capital, quantify and map ecosystem service values, highlight spatial, temporal, and social differences in ecosystem service production and delivery of services to beneficiaries, and explore trade-offs. In this section we explore four key themes describing scientific progress and challenges: the provision and resilience of ecosystem services, the value of natural capital and ecosystem services, governance, and the impacts of policy and management.

Understanding the provision and resilience of ecosystem services.

New knowledge, metrics, data, and tools have made it easier to assess and account for nature's benefits to people and provide tangible ways to identify and weigh trade-offs resulting from different possible decisions. Progress has been made in quantifying, mapping, and exploring relationships among multiple ecosystem services and biodiversity predicting changes in land use, climate, and other drivers of ecosystem change; and spatial modeling of how changes in ecosystems are likely to lead to changes in the flow of ecosystem.

Less progress has been made in understanding complex, adaptive system dynamics, including feedbacks and the potential for climate change and other major disruptions to affect natural capital and the future provision of ecosystem services. Recent progress in the area of complex systems and resilience of ecosystem services uses both natural and social science to understand how environmental and social shocks disrupt systems, and in turn how those systems respond in ways that either undermine or maintain sustainability. Combining approaches to understanding resilience with ecosystem service modeling will assist evaluation and design of alternative management interventions so that ecosystem services are more secure in an uncertain future.

Understanding the value of ecosystem services and natural capital.

Ecosystem service valuation.

The value of ecosystem services is not always clear to decision-makers or the public. Monetary valuation of ecosystem services is sometimes helpful. Market and nonmarket valuation methods from economics are used to estimate ecosystem service values. Numerous studies report values for a range of services across many

locations but these first-generation studies generally are insufficient for robust extrapolation to other locations. Where monetary valuation is highly contested or lacks robustness, or where monetary value metrics are not relevant to decisions, it is often preferable to report outcomes in biophysical terms or directly in terms of impacts on human health or livelihoods. Although recent work has begun to describe the varied ways in which natural systems affect human health and well-being, the paucity of models and tools for exploring regulating and cultural services and connecting them to human health and well-being metrics is a critical research gap.

Natural capital accounting.

Maintaining natural capital is essential for future flows of ecosystem services. Focusing only on trends in the provision of services is insufficient. Current provision of ecosystem services can be increased temporarily by reducing natural capital, such as by harvesting more fish at the expense of depleting stocks. Natural capital accounts are an important additional tool for informing sustainable development. Such accounts highlight areas of developing “natural capital deficit” that may require policy intervention.

A number of accounting frameworks for natural capital have been developed, including “inclusive wealth,” which attempts to value all forms of capital assets: human, manufactured, social, and natural capital. Increasing inclusive wealth means that future generations are endowed with a larger “productive base,” capable of providing more goods and services to support human well-being. Inclusive wealth can be used as a gauge of sustainability, although accurate measurement of the value of capital assets is challenging. Including future as well as present values raises questions of how to properly aggregate values over time. Economists typically argue that future values should be discounted. However, the appropriateness of discounting in cases affecting natural capital with potentially profound influences on future generations is controversial and entails ethical as well as economic considerations. Debates on discounting in the context of climate change policy highlight the importance and lack of agreement on how society should aggregate benefits and costs over time.

Understanding governance: Social norms, policy, incentives, and behavior.

Natural capital is degraded and ecosystem services are underprovided in large part because of a failure of markets and other institutions to provide proper incentives to conserve and value them. Reform of policies and institutions can help correct the fundamental asymmetry that rewards production of marketed commodities but fails to reward ecosystem service provision. Incentives to maintain or enhance natural capital and increase provision of ecosystem services can be provided in a variety of ways, including PES, environmental taxes, cap-and-trade schemes, environmental laws and regulations, product certification, and encouraging social norms for stewardship.

Social-ecological systems are complex, characterized by multiple interacting processes with nonlinear and stochastic dynamics. Multiple scales (local to international) and forms of governance (e.g., social norms and policy rules) often overlap and intersect and typically differ from the biophysical scales at which ecosystem services are generated. Policy design for governance of social-ecological systems should reflect the underlying complexity of such systems and should account for the complex spatial patterns of ecosystem service supply and the spatial patterns that link supply with beneficiaries. The integration of behavioral economics, psychology, and resilience theory offers potential for more effective policy design. Behavioral economics and social psychology provide insights into how people make decisions and can lead to better policy and management interventions. A growing body of literature has analyzed approaches for adaptive management, co-management, and governance. A better understanding of human motivations, preferences, and cultural norms surrounding nature and its benefits is a prerequisite for changes in human–nature interactions. Anthropology, behavioral economics, psychology, sociology, and other social sciences are directly relevant.

Understanding impacts of policy and management.

Assessing the impacts of policies and decisions on the sustainable use of natural capital and the provision of ecosystem services is essential for testing assumptions, and enabling on-going learning and adaptive management. Some advances have been made in evaluating the impact of protected areas and PES programs on biophysical and social outcomes. Impact evaluation of conservation actions on

aspects of human well-being is significantly behind other fields (e.g., education and health impact evaluation) and remains a critical area for further work.

Evaluating impacts requires monitoring of relevant biophysical and socioeconomic measures. Most current monitoring data are inadequate. The obvious solution is more comprehensive or more relevant data collection, but this is costly. Analysts must often try to make clever use of whatever data exist.

Assessing policy impacts is complicated by confounding factors, complex feedbacks, and potentially long lags between action and impacts. Accurately assessing impacts of a program requires comparison of conditions postimplementation and a counterfactual of conditions had the program not been instituted. Because it is often difficult to design experiments at landscape scales, careful control both of the factors going into selection of areas for program implementation and for potential confounding factors is needed for relatively unbiased estimates of program impact. Attribution of impacts from a policy intervention often involves trying to trace through a complex chain of causation. Understanding complex causal links is often incomplete and likely to remain so with emerging novel climate and ecosystem conditions. Complexity regarding causation of impacts can complicate implementation of policies such as PES, with disputes likely over who should pay for services, how much, and who should bear the risks of underprovision. Shared understanding of social-ecological dynamics can reduce, but is unlikely to eliminate, disputes. For many recently instituted interventions, it is simply too early to see significant impacts. For example, habitat destruction (or restoration) can lead to eventual biodiversity loss (or increase) but the effect may take decades to centuries. However, program evaluation—even if interim and incomplete—offers immense value for the design and ongoing improvement of effective policies.

4.5. Incorporating Natural Capital and Ecosystem Services into Policy and Management.

National governments, international organizations, businesses, and nongovernmental organizations have begun to incorporate natural capital and ecosystem service information into policy and management, but it is not yet standard practice. In addition authorities should develop action plans for the efficient protection and development of protected areas. The Action Plan should aim to move away from separate natural environment policies on wildlife, water, soil,

and air quality towards a more joined-up approach taking account of the natural environment as a whole. Central to the action plan should be the idea that living things and their physical environment depend on each other - changes in one part of our environment can have consequences, positive and negative, on another. This new approach should also seek to ensure that the full range of benefits that a healthy natural environment provides - 'ecosystem services' - are fully recognized in policy and decision-making across Governments. This highlights the fact that the environment supports economic and social development.

The Action Plan should intended to deliver a number of important benefits:

- more effective delivery of our environmental outcomes
- better-informed decisions that take full account of environmental impacts
- better prioritization and more efficient use of our resources more effective communications and greater awareness of the value of the natural environment and ecosystem services
- enable Ministry and delivery partners to better respond to changing pressures, including climate change

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