

Mari-Curie Training Course on the Human Dimension of Global Environmental Change

The Distributional Implications of Environmental Change and Governance

Title:

Environmental Governance as a Political tool to Maintain Socio-Ecological Resilience and Sustainability

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1. Introduction

Human activity and ecological systems are interconnected and we should treat nature from both sides. Thus, this topic should be discussed from a holistic point of view not only from natural science but also from social sciences which includes economics, politics, governance and community development. Biodiversity loss and resilience have already become an urgent topic for future generations and need to be looked at from different aspects.

Conservation is now an issue of international concern. This is partly due to the development of a worldwide 'global commons' ethic, and partly because conservation is increasingly linked to international trade - either due to the growth in world-wide tourism or because rare biological and cultural commodities have an international market.

There are motley environmental problems related to human activities, and the creation of protected areas such as national parks is one of the solutions being adopted for the conservation of nature and endangered species, or other aspects of human heritage. Many of these sites have links to tourism, as this is often seen as a mechanism

to offset the costs of administering a site, as well as providing education.

Various work on resilience has focused on the capacity to absorb shocks and still maintain function. Applying this theory to tourism management practice could give a better solution to environmental problems caused by human impact.

The governance of natural resources is emerging to confront with new challenges. Currently, an increase can be observed in the different level of connections between different environmental issues and decisions of local, regional, national and international relevance. There is a need for a stronger and more intensive coordination and exchange.

The central question of this paper is:

Can Adaptive Governance be a political tool to maintain socio-ecological resilience and sustainability?

Examples are taken from Biodiversity Conservation field.

2. Aims and objectives

The aim of the study is to identify problems associated with the management of conservation sites in a number of countries, to identify their causes, and ultimately suggest possible management strategies that can improve the present situation.

The specific aims and objectives of the study are to:

- To assess the reactions and impressions of some visitors to these sites with a view to identify potential problems/conflicts of interest.
- To build on the theory of socio-ecological resilience and evaluate and suggest mechanisms for managing the potential conflicts between wildlife (biodiversity) and tourism, giving appropriate consideration to both environmental and economic aspects.

3. Research Methodology

The study will be based on a combination of secondary and primary data. To support argument firstly, the theoretical foundations of human nature relationships and socio-ecological resilience, adaptive governance on protected areas and tourism and will be presented. The sources will be theoretical literature regarding through natural and social sciences in socio-ecological management policy and process, especially on resilience theory.

Later, interview works with multi-level actors related to Conservation Management issues shall be done as a primary sources of this research.

4. Relation between Human and Ecosystem

Humanity is a major force in global change and shapes ecosystem dynamics from local environments to the biosphere as a whole (Redman, 1999; Steffen et al., 2004; Kirch, 2005).

At the same time human societies and globally interconnected economies rely on ecosystems services and support (Millennium Ecosystem Assessment, 2005). Vogel (2006) discuss that research about global environmental change requires coordination and cooperation between social and natural scientists working on local, regional and global scales.

Butler and Boyd (2000) present a model for the interaction between people and the environment (Figure 4.1).

Figure 4.1: Interaction between people and environment in parks (modified from Butler and Boyd 2000)

Parks and people

- Local communities
- Tourists, visitors
- Management authorities

↓ ↑

Parks and 'natural' environment

- Wildlife focus
- Ecologically sensitive focus
- Polar regions (inaccessibility, management strategy)

Environmental policies have evolved rapidly in recent years, with new institutions and new instruments emerging in many contexts in response to new political agendas and also the wider recognition of new environmental pressures. At the same time, globalization and liberalization have led to a more widespread acknowledgement of the

weaknesses of the state. This in turn has led to increased interest in new modes of environmental governance that rely not only on the state but also on civic and market actors. Although it is accepted that this tends to lead to decentred (i.e. multi-level, multi-actor) processes, these new forms of governance (if indeed they are new) remain poorly understood. (Paavola et al, 2000).

5. The Value of Biodiversity

Biodiversity is vital for ecosystem functioning, and for ecosystems' ability to facilitate life-supporting services for people. Having a wide diversity of life on Earth is valuable for a variety of reasons. Examples of ecosystem services include biomass production, nitrogen fixation, nutrient cycling, control of water runoff, purification of air and water, soil regeneration, pollination of crops and natural vegetation, and partial climate stabilisation.

There are two categories of biodiversity Use values. The Direct Use Values when species provide various goods or products to humans, many of which play important roles in human economies. Examples include food, medicine, timber, fiber, etc. The second category is the Indirect Use Values when species provide services to humans as well as to other species. These include pollination, nutrient cycling, regulation of the atmosphere and climate. Some other indirect values include:

- **Ecological Value:** All species are supported by the interactions among other species and ecosystems, each providing an ecological value to one another. Loss of species makes ecosystems less resilient and often less productive.
- **Cultural and Spiritual Value:** The identity of human cultures around the world is attached to varying degrees to wild species.

Economists are just beginning to calculate the value of ecosystem services to humans at regional and global levels. The calculations are still at a preliminary level, but they suggest that the value of ecosystem services is enormous, around \$32 trillion per year, greatly exceeding the direct use value of biodiversity (Costanza et al.1997).

Nebel and Wright (2002) categorised the value of natural species into four areas:

- Sources for agriculture, forestry, aquaculture, and animal husbandry.
- Sources for medicines and pharmaceuticals.
- Recreational, aesthetic, and scientific value.
- Intrinsic value.

A major challenge is to develop governance systems that make it possible to relate to environmental assets in a fashion that secures their capacity to support societal development for a long time into the future (Costanza et al., 2000; Lambin, 2005). Otherwise, the society would corrupt as it is relying on the ecological system more or less which has discussed above.

However, the two groups of experts have differing views as to the value of biodiversity. Ecologists examine biodiversity and its role in ecosystem functioning and evolution in a descriptive way. They believe is independent of subjective human values and, as a result biodiversity is perceived as essential for ecosystem functioning (Schulze and Mooney, 1993; Holling et al., 1995; Perrings et al., 1995; Daily, 1997; Kinzig et al., 2001; Loreau et al., 2001; Loreau et al., 2002; Hooper et al., 2005; Millennium Ecosystem Assessment, 2005).

Ecological economists argue that these ecosystem services are essential to support human existence on Earth. No man-made substitutes can adequately replace any of these services at the scale at which we currently depend on them. These economists therefore argue that the ultimate value of biodiversity consists in safeguarding ecosystem functioning and the provision of a number of essential life-supporting ecosystem services for humankind (Perrings et al., 1995; Daily, 1997; Mooney and Ehrlich, 1997).

Ecologists, and not few ecological economists, tend to regard humans mainly as a biological species like all others (i.e. the human being is regarded as a *Homo biologicus* - Manstetten et al., 1998). In this view, and in contrast to the economic perspective, the fundamental and total dependence of human beings on nature and its biodiversity becomes obvious.

6. Socio-Ecological System and Institutions

Social and ecological dynamics and the human dependence on the capacity of

ecosystems to generate essential services, and the vast importance of ecological feedbacks for societal development, suggest interconnection of social and ecological systems (Galaz et al., 2008). To emphasise the concept, Berkes and Folke (1998) use the term social-ecological system (SES). Social-ecological systems include societal (human) and ecological (biophysical) subsystems in mutual interactions (Gallopín, 1991).

The SES concept places humans within nature and focuses on the way in which interconnections between people and their biophysical contexts produce complex adaptive systems. Complex adaptive systems are nonlinear, meaning that a given cause – often resulting from a complex chain of biophysical and human interactions – can produce a disproportionate effect. The nonlinearity of complex system processes makes predicting the outcomes of reorganization difficult from both scientific and decision-making points of view. These systems adapt to change; whether or not the adaptation is amenable to the biota or humans in the region is often a matter of chance (Morehouse et al. 2008).

Both social and ecological systems contain units that interact interdependently and each may contain interactive subsystems as well. A social system includes economy, actors and institutions in mutual interaction (Kluvankova 2009). Institutions are regarded in this paper as social rules that define socially acceptable individual or group behaviour: they are sets of dual expectations that structure social interaction (Hodgson, 2002; Bromley 1989, 2006).

Ecological systems include self-regulating communities of organisms interacting with one another and with their environment (Berkes F., Colding J., Folke C., 2003). Biodiversity governance implies establishing compatibility between ecosystems and social systems (Kluvankova 2009). It involves the establishment and enforcement of embedded social rules that structure interactions between social and ecological systems (Paavola and Adger, 2005; Hodgson, 2004). The connectivity pattern within and between social and ecological systems plays an important role in designing effective institutions for sustainable resource use (Gatzweiler and Hagedorn, 2002).

7. Concept of Resilience and Adaptive Governance

Resilience Concept

Resilience is a core concept used by ecologists in their analysis of population ecology of

lands and animals and in the study of managing ecosystems (Folke 2006). My understanding on resilience has focused on the capacity to absorb shocks and still maintain function. Resilience provides capacity to absorb shocks while maintaining function and provides components for renewal and reorganisation following disturbance and sustains capacity for adaptation and learning. (Holling 1973, Carpenter et al. 2001, Folke 2006). Further, cross-scale subsidization can increase the vulnerability of the broader system. This is because vulnerability can never be entirely eliminated (Anderies et al. 2006).

A resilient ecosystem has the capacity to withstand shocks and surprises and, if damaged, to rebuild itself. In a resilient ecosystem, the process of rebuilding after disturbance promotes renewal and innovation. Without resilience, ecosystems become vulnerable to the effects of disturbance that previously could be absorbed. Clear lakes can suddenly turn into murky, oxygen-depleted pools, grasslands into shrub-deserts, and coral reefs into algae covered rubble. The new state may not only be biologically and economically impoverished, but also irreversible.

Human and ecological systems are dynamic, interacting and interdependent. Resilience in such combined social-ecological systems concerns:

- how much shock the coupled human and natural system can absorb and still remain within a desirable state
- the degree to which the system is capable of self organization
- the degree to which the system can build capacity for learning and adaptation

When the supply of ecosystem goods and services is diminished, human societies suffer from effects such as soil erosion, floods and crop failure. These effects can have grave implications for human health, wealth, livelihood, food security, social cohesion, and even democracy. Therefore, actively promoting ecosystem resilience is critical to ensuring future human welfare (Vatn, 2005).

The figure 7.1. has been presented by Andy Stirlings at Themes summer School in June 2009 and illustrates the dynamics of sustainability with four necessary and sufficient dynamic properties which are namely stability, resilience, durability and robustness. The theoretical framework that the graph is proposing can help to understand the dynamics of sustainability on Socio-Ecological Systems.

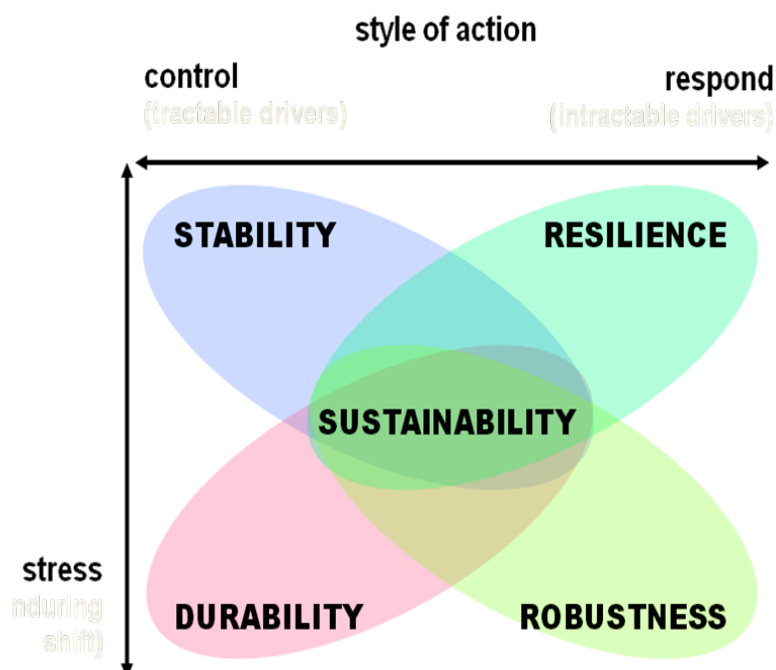


Figure 7.1. Dynamics of Sustainability

Resilience concept has increasingly been used in the analysis of human-environment interactions. Holling (1973) states that “Resilience determines the persistence of relationships within a system and is measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters and still persists.” (M.A.Janssen, E.Ostrom,2006). The resilience perspective is increasingly used as an approach for understanding the dynamics of social–ecological systems (Folke 2006).

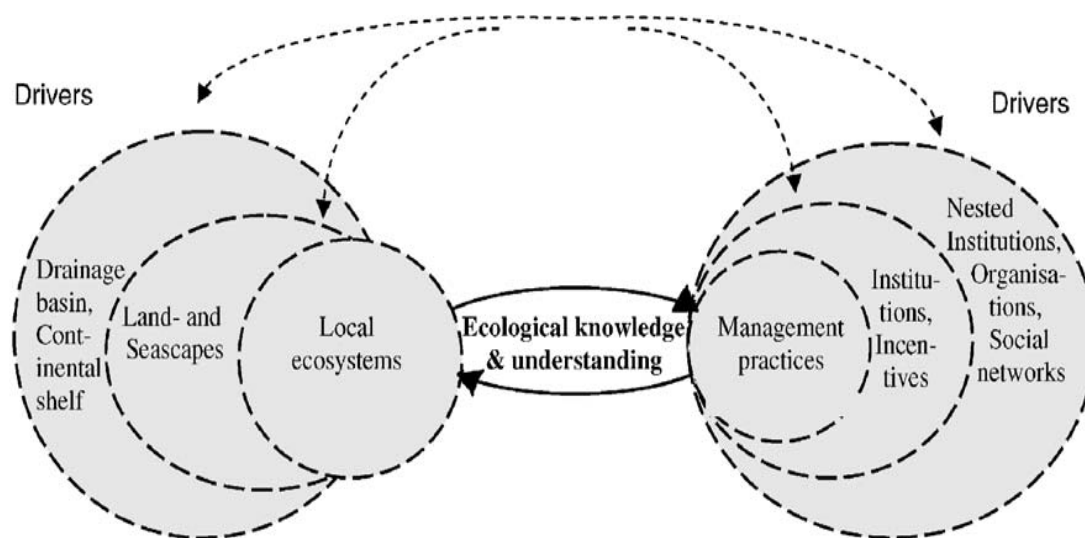
The resilience perspective shifts policies from those that aspire to control change in systems assumed to be stable, to managing the capacity of social–ecological systems to cope with, adapt to, and shape change (Berkes et al., 2003, Smit and Wandel, 2006). In a resilient social–ecological system, disturbance has the potential to create opportunity for doing new things, for innovation and for development. In vulnerable system even small disturbances may cause dramatic social consequences (Adger, 2006). Old dominant perspectives have implicitly assumed a stable and infinitely resilient environment where resource flows could be controlled and nature would self-repair into equilibrium when human stressors were removed. (Folke 2006). It is argued that managing for resilience enhances the likelihood of sustaining desirable pathways for development in changing environments (Walker et al., 2004; Adger et al., 2006). Even

the society realise the environmental problems and need to take action, mutual agreement to have consensus is always not an easy task.

Current research inspired by social scientists making significant contribution to the political, economic, social and cultural dimension of global environmental change. Efforts to improve the knowledge on the human dimensions of global environmental change and ensure relevance to society require periodical assessment of the conceptual frameworks used in the study of complex issues. There should be multidimensional and multi-scale concepts that could facilitate the understanding of the various complex interactions.

There are several conceptual frameworks developed in relation to the resilience approach. Figure 7.2. is a framework that focuses on knowledge and understanding of ecosystem dynamics, how to navigate it through management practices, institutions, organizations and social networks and how they relate to drivers of change (modified from Berkes et al. 2003, Folke 2006).

Figure 7.2. Ecosystem Dynamics and Resilience Approach

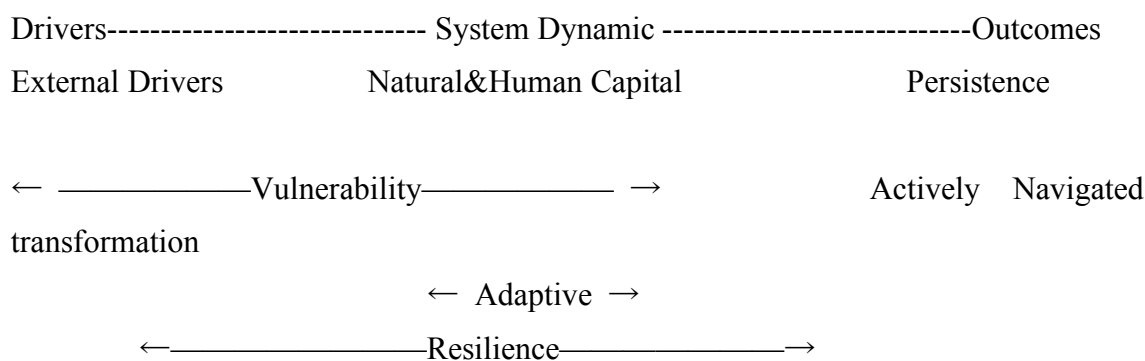


Adaptive Governance

Adaptation to environmental variability has been a focus of anthropologists since the early 1900s. Adaptation is generally perceived to include and adjustment in social-ecological systems in response to actual perceived or expected environmental

changes and their impacts. Folke (2009) discuss that the incidents range of vulnerability, adaptive and resilience with interaction between external drivers, natural and human capital and persistence. (Modified from Folke 2009).

Figure 7.3. System Dynamics and drivers



The governance of the commons as interdisciplinary research field is becoming central research and policy agenda. Key issue is reframing regulatory and centralised governing processes to co-ordination of social relations in the absence of a unifying authority but with the involvement of various actors that are independent of a central power and acting at and across different levels (Kluvankova 2009).

Governance becomes organised through multiple jurisdictions and can no longer be understood as a central state monopoly (Hooghe and Marks, 2003). Governance implies the involvement of various actors that are independent of a central power and operate at different levels of decision-making (Rhodes, 1996; Stoker, 1998). Additionally, governance is not restricted by temporal or spatial limits and can thus travel easily across categories and disciplines, allowing it to be used on different spatial scales (Jordan, 2008).

Adaptive governance relies on polycentric institutional arrangements that are nested, quasiautonomous decision-making units operating at multiple scales (Ostrom 1996, McGinnis 1999). Spanning from local to higher organizational levels, polycentric institutions provide a balance between decentralized and centralized control (Imperial 1999). Also, adaptive governance relies on networks that connect individuals, organizations, agencies, and institutions at multiple organizational levels (Folke et al. 2005). This form of governance also provides for collaborative, flexible, learning-based

approaches to managing ecosystems, also referred to as “adaptive co-management” (Folke et al. 2003, Olsson et al. 2004a).

Folke et al. (2005) analyse framework concept of adaptive governance that follows:

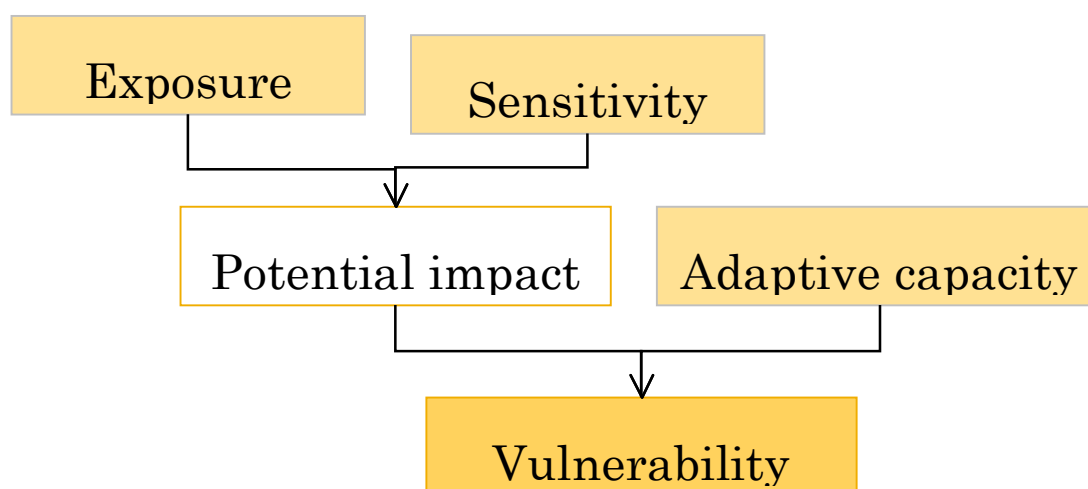
- social dimensions of management of dynamic landscapes
- the interactions between individuals, organizations, agencies, and institutions at multiple levels
- social conditions and sources of significance in responding to crisis, shaping change and building resilience for reorganization and renewal of social-ecological systems.

(Modified from Folke, C., et al. 2005.)

Olsson et al. (2004b) discuss that Social-ecological transformations toward adaptive governance occur in three phases. First, systems are generally prepared for the changes that are about to occur. The second phase involves a transition to a new social context for ecosystem management. The third phase is building the resilience of the new direction. Also, Olsson et al. (2006) argue that the emergence of shadow networks for adaptive governance is a self-organizing process often triggered by a social or ecological crisis. The impetus for this is often the recognition of the need for an alternative approach for governing SESs. Self-organizing processes observed by Olsson et al. (2004a) toward adaptive co-management of ecosystems usually start with responses to crises by individual actors that expand to groups of actors and eventually become multiple-actor processes. Knowledge develops as part of this process and becomes embedded in the emerging organizational and institutional structures. (Olsson et al. 2006). Linking different networks and creating opportunities for new interactions are important when dealing with uncertainty and change.

IPCC (2007) defines vulnerability as below: “Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.”

Figure 7.4. is modified from Preston et al. (2008) which explains the several causes of vulnerability.

Figure 7.4. Vulnerability

(Modified from Preston et al. 2008)

A vulnerable social–ecological system has lost resilience. Losing resilience implies loss of adaptability. Adaptability in a resilience framework does not only imply adaptive capacity to respond within the social domain, but also to respond to and shape ecosystem dynamics and change in an informed manner (Berkes et al., 2003). The variables and processes that structure ecosystem dynamics and sources of social and ecological resilience have to be understood and actively managed to deal with the interplay of gradual and abrupt change.

Kluvankova (2009) argues that, in order to maintain resilience of environmental governance, it need to adopt governance mechanisms, in particular a design for proper rules for participation and accountability. Later can be addressed by the polycentric structures which emphasise the governance systems that manage to distribute capacities and duties across levels with co-existence of many centres of decision-making, formally independent of each other and thus can integrate participation of non-state actors.

The main point of “poly-centred governance system” is that, it can create opportunity for self-organisation and cross-scale linkages of multiple actors, achieve better outcomes than fully decentralised or centralised systems and thus can be more resilient than traditional hierarchical governance systems (Kluvankova 2009).

The concept, known as multilevel governance, was first devised by Gary Marks (1993) in relation to the decentralisation after the 1950s and implementation of regional

and structural policy reforms. Multilevel governance of complex network of different actors operating at different levels who both govern and are governed indicates that, even under a narrow definition, governance must be a complex, multi-actor, multi-level process (Paavola, 2007; Paavola et al., 2009).

8. Governance on Protected Areas

Protected areas are internationally recognized as a major tool in conserving species and ecosystems. They also provide a range of goods and services essential to sustainable use of natural resources. As a result, countries often have extensive systems of protected areas developed over many years. These systems vary considerably country to country, depending on national needs and priorities, and on differences in legislative, institutional and financial support. A protected area is defined as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources, managed through legal or other effective means (UNEP, 2002).

National parks (and similar designated protected areas) contribute to conservation, recreation, education, and to economic development. Broad examples of conservation of endangered species in National Parks include that of rare species such as the Rhinoceros and elephant(s). Examples of recreational activities available in National Parks somewhere in the world include hiking, mountaineering, and skiing. Facilities for formal or informal education are available in many locations catering for school or college trips, biology field classes and some cultural experiences that cannot be provided in the standard classroom.

A national park is a reserve of land, declared or owned by a national government, they are protected from most human development and pollution.

A national park was deemed to be a place where:

- One or several ecosystems are not materially altered by human exploitation and occupation, where plant and animal species, geomorphologic sites and habitats are of special scientific, educative and recreative interest or which contain a natural landscape of great beauty.
- The highest competent authority of the country has taken steps to prevent or eliminate as soon as possible exploitation or occupation in the whole area and to enforce effectively the respect of ecological, geomorphologic or aesthetic features which have

led to its establishment.

- Visitors are allowed to enter, under special conditions, for inspirational, educative, cultural and recreative purposes.

(Modified from Xenidis, Shioya 2008).

The economic influence of Protected Areas are difficult to calculate, but its importance can be judged from the level of national publicity given to the parks, the numbers of visitors that parks attract, the level of the associated tourist support (accommodation, food and transport) and souvenir industries and the fact that some parks make charges for entry (Seta 2002).

The National Park concept is the one of the tools to protect and conserve biodiversity and wildlife, and at the same time, these parks usually also have tourism aspects. The negative aspect of tourism is it has the possibility of damaging the environment, which can counteract the conservation aspect of the National Parks. However, the tourism industry can arguably cause lighter damage if it is managed properly. While National Parks generally give priority to biological conservation, the equivalent concept of World Heritage Sites includes areas that are primarily of socio-cultural importance, where the connection to tourism is particularly important. In either case, it is accepted that sound management of the area requires an interaction of all stakeholders.

State property, such as National Park or other Protected Areas, involve ownership by a national, regional, or local public agency that can forbid or allow use by individuals. Individual property holders can exhibit their private interests to explore and preserve. Kluvankova (2009) argues that, common (group) property represents collective private ownership with primary difference from individual property in collective decision making such as buying, selling or maintaining the commons. When valuable common property resources are left to an open-access regime, degradation and potential destruction are the result regardless property type (Ostrom 1990, 1999). To prevent open access each well-managed common property resources regime involves and requires that rules evolve regardless of the property rights (Ostrom 1990).

Centralised governments are slowly changing and decision-making authority is being established (Kluvankova 2009). Participatory approaches are becoming part of decision-making; however, still in a consultative way while little evidence on direct

non-governmental participation in decision-making has been documented (Bache and Flinders, 2004).

Bache and Flinders (2004) defined multilevel governance as “the dispersion of central government authority both vertically, to actors located at other territorial levels, and horizontally, to non-state actors”. Similar concepts to describe those developments are “multi-tiered governance, multi-perspective governance (Marks and Hooghe, 2004) and polycentric governance (Ostrom et al., 1961). Multilevel governance can be characterised by four characteristics Bache and Flinders (2004):

- (i) decision-making at all territorial levels is characterised by the increased participation of non-state actors;
- (ii) the complexity and dynamics of actors and their networks make identification of territorial levels more difficult;
- (iii) the role of the state is being transformed from a regulator to a co-ordinator of power and authority;
- (iv) and finally the multilevel character of governance is challenging the traditional representative nature of accountability.

9. Sustainable Tourism and Regional Development

Sustainable Tourism

Tourism is one way to use global biodiversity and cultural diversity to economic advantage, but it may have impacts on biodiversity and cultural diversity itself (German Federal Agency for Nature Conservation, 1997), although this damage can arguably be limited if it is managed properly.

Tourists provide a significant potential source of income that might contribute towards the cost of conservation programmes, and the tourist demand for recreation and holidays is growing with increases in real incomes and leisure time. This potential for growth is often considered to be more than just short-term (Williams and Shaw 1991, Tisdell 2001). In the developing world, economic planners are putting emphasis on how to create and stimulate incomes in rural areas where many of the poorest people are to be found. Where tourism can develop using natural infrastructure and climatic advantage, it is often seen as a cost-effective way of meeting these national and regional development objectives (Jenkins and Lickorish, 1997). However, tourism has a difficult relationship with conservation management. This economic market is fragile and

affected by externalities.

Tourism has impact to SES and also has impact from society. The potential major environmental impacts of tourism on the natural environment are varied (modified from Hunter and Green 1995):

- Impacts on vegetation - changes in the extent or nature of vegetation cover through clearance or planting to accommodate tourist facilities; destruction of vegetation through the gathering of wood or plants; and tramping; damage of residual vegetation by feet and vehicles; and changes in land used for primary production.
- Direct effects on animals are also possible - disturbance causing inward or outward migration or disruption of breeding habits; over-exploitation of biological resources (e.g. over-fishing); and killing of animals through hunting or to supply goods for souvenirs.
- Visitor-related pollution must also be taken into account - water pollution from sewage and fuel spillages; air pollution from vehicle emissions or heating/lighting fuels; and noise pollution from transportation and other tourist activities.
- Physical pressures resulting in damage to riverbanks and geological features (e.g. caves), changes in the risk of landslips and avalanches, and soil compaction with its associated increases in surface run-off and erosion, are all significant issues.
- Physico-chemical effects include depletion of ground and surface water supplies and change in hydrological patterns; loss of mineral resources for building materials or fossil fuels to generate energy for tourist activity; and change in fire risks.
- Visual impacts of the visitor facilities (e.g. buildings, chairlift, car park), or their by-products (litter, sewage, algal blooms etc.).

A region of outstanding natural beauty or some other scarcity value (e.g. rare species) may attract too many visitors, leading to the destruction of the asset that made the area attractive (Deegan and Dineen, 1993). The development and commercialisation of ecotourism is also a step in the direction of bringing some discipline to international externalities. By commercializing the environmental services implicit in ecotourism, there is, principle, a vehicle through which environmental preferences of consumers can be translated into monetary payment to service providers. Purely private property rights, however, are unlikely to foster desirable promotion of ecotourism, and local government involvement is likely (Pearson, 2000).

Regional Development

McIntosh et al (1995) broadly defined tourism as the "sum of the phenomena and relationships arising from the interaction of tourists, business suppliers, host governments, and host communities in the process of attracting and hosting these tourists and other visitors". Similarly, Airey and Tribe (2005), following Gunn (2002), classified tourism as "a multidisciplinary field, which is generated by demand and supply, and includes many geographic, economic, environmental, social, and political dimensions".

The impacts of tourism are often left on a regional basis - at which level they come to the attention of economic planners. Tourism often makes use of natural landscape, and can arguably be the best economic option in low-income areas. In the case of rural Scotland, for example, where tourism is the dominant sector in the economy, many of the attractive mass-tourism regions such as the Highlands or the various islands, have poor agriculture soils and difficult climates. Their under-developed infrastructure makes some alternative development, for example light industry or general manufacturing, non-viable. Therefore, tourism may provide an attractive alternative to low-income agriculture or forestry. Tourism could also have a difficult relationship with conservation management. Hunter and Green (1995) categorised the problems associated with tourism impacts as follows:

- activities may be pursued both by tourists and by the host population, making it difficult to separate impacts arising from tourism alone;
- similarly, they may occur together with other economic activities environmental change occurs naturally, making tourism-induced change more difficult to measure;
- a lack of detailed knowledge of baseline environmental conditions prior to the advent of tourism frequently limits post-development investigations in any area;
- components of the environment are inter-linked, and so tourism activities that impact on one aspect of the environment may have other indirect impacts.

In addition, similar impacts can result from different aspects of the overall tourism development. For example, air pollution can accompany tourism developments from the construction of buildings, other tourist facilities and associated infrastructure, from the burning of fossil fuels to provide heating and power, from the exhausts of private tourist vehicles, and in the transport of tourists destinations by air, road, rail, etc. (Hunter and Green, 1995).

Figure 9.1. shows the interconnection between Tourism and Climate change.
(Modified from Perch-Nielsen 2008)

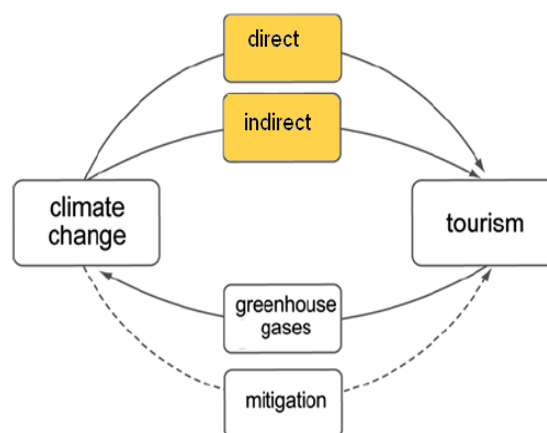


Figure 9.1.
Tourism and climate change interconnection

Impacts of tourism development are not restricted to destination areas, but spread over wider areas depending on the strength of the linkages (economic, social, transport, environmental, etc.) between the host area and its surroundings. This makes the task of comprehensive impact assessment even more difficult (Briassoulis, 1991).

Many of the impacts can be on the socio-cultural environment, affecting language, religion, values and norms, and traditions including arts and crafts, but not all of these are necessarily negative (Hunter and Green, 1995).

- growth of minority languages due to tourist demand
- increased importance of religious festivals and pilgrimages
- loss of esteem and adoption of servile attitudes towards tourists
- development of a market for traditional paintings, sculpture and other craft goods
- increased demand for traditional drama, music and dance, and literary forms
- increasing employment opportunities for local craft and performance artists
- evolution of traditional practices to suit visitor tastes

Tourism needs proper management for itself. People could rush to one small touristic place and could cause problems. This could be ecological problems, but they could also destroy other touristic values, such as enjoying the beauty of nature, sublime scenery, or relaxing in quiet countryside.

Arrow et al., (1995); Berkes and Folke., (1998) discuss that "It is now clear that patterns of production, consumption and wellbeing develop not only from economic and social relations within and between regions but also depend on the capacity of other regions' ecosystems to sustain them".

10. Conclusion

Environmental policies have evolved rapidly in recent years, with new institutions and new instruments emerging in many contexts in response to new political agendas and also the wider recognition of new environmental pressures.

At the same time, globalisation and liberalisation have led to a more widespread acknowledgement of the weaknesses of the state. This in turn has led to increased interest in new modes of environmental governance that rely not only on the state but also on civic and market actors. Although it is accepted that this tends to lead to decentred (i.e. multi-level, multi-actor) processes, these new forms of governance remain poorly understood. (Paavola, 2009).

Conservation is now an issue of international concern. This is partly due to the development of a worldwide 'global commons' ethic, and partly because conservation is increasingly linked to international trade - either due to the growth in world-wide tourism or because rare biological and cultural commodities have an international market. Biodiversity loss and resilience have already become an urgent topic for future generations and need to be looked at from different aspects. There are many environmental problems related to human activities, and the creation of National Parks and is one of the solutions being adopted for the conservation of nature and endangered species, or other aspects of human heritage. Many of these sites have links to tourism, as this is often seen as a mechanism to offset the costs of administering a site, as well as providing education. However, as has been indicated by the survey respondents, any human interaction could bring some negative effects to the park/site, and these need to be effectively managed. Every site is unique and the challenges involved in management differ from country to country, and even region to region or site to site.

Adaptive governance can be a political tool to maintain socio-ecological resilience and sustainability when there are participatory processes at multi-level especially in conservation issues. Water, air, land, biodiversity are the common resources for whole human and for natural system on the earth. Which should include local residents aspects. Participation has the potential to promote adaptiveness in environmental governance, with building up critical social relationships and learning in resource-based communities and locals (Blazquez, 2009).

Management and adaptive governance at each local level depends upon developing human awareness, not only among the visiting tourists, but also the local residents and

the various authorities. Poor management and governance caused by a lack of information, education and participation, or actual neglect would create further problems. So the authorities, especially institutions must continuously assess the human impacts upon their sites. Following this, they need to inform and educate both tourists and locals in order to encourage people to protect the natural or cultural heritage resource concerned. Where the pressure comes from illegal activities they need to actively enforce the legislation.

Efforts to improve the knowledge on the human dimensions of global environmental change and ensure relevance to society require periodical assessment of the conceptual frameworks used in the study of complex issues. There should be multidimensional and multi-scale concepts that could facilitate the understanding of the various complex interactions.

References

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