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**Ecotourism and Nature Conservation : the Use of the Safe Minimum  
Standard (SMS)**

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## **Ecotourism and Nature Conservation: the Use of the Safe Minimum Standard (SMS)**

### **Introduction**

Ecotourism has emerged as a special niche market in many countries particularly after the 1980s. It is the fastest growing segment in the Australian tourism industry. The concept of ecotourism however still remains very nebulous with a diversity of meanings being attributed to it by various authors. Budowski (1977) believes that ecotourism can be managed to develop a symbiotic relationship with nature conservation and the tourism experience. The advocates of ecotourism emphasise that the adverse environmental effects of mass tourism can be mitigated through ecotourism. This paper examines the definitions, objectives and the use of the SMS in providing a practical insight into incorporation of the environmental conservation objectives into actual ecotourism ventures.

### **Definitions of Ecotourism**

The word ecotourism is commonly used to describe nature-based tourist experiences but definitions abound. The definitions differ in their emphasis but some overlap in all definitions is observed. All definitions accept the nature-based character of ecotourism and the differences remain in the other objectives included such as environmental conservation, ecological sustainability, intergenerational equity, support for indigenous development and cultural preservation.

The rise of ecotourism in recent years was stimulated as a reaction to the significant adverse environmental impacts of mass tourism. While environmental effects are associated with any economic activity, the impacts of tourism attracts special concern because it uses the most vulnerable and fragile natural resources which are prone to damage and deterioration even by mild exposure. In absolute terms, the total impacts of tourism is certainly not as high as other economic activities such as agriculture. Ecotourism involves non-consumptive use of nature to obtain an enjoyable experience but it goes beyond a simple experience. The conservation objective of ecotourism also means that it should impart an environmental education to the tourist to create an environmentally benign attitude.

An evolutionary pattern can be discerned in the definitions of ecotourism when the different definitions are reviewed. Many quote the definition by Ceballos-Lascurain (1988) who defines ecotourism as "tourism that involves travelling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring and enjoying the scenery and its wild plants and animals as well as any existing cultural manifestations. Zell (1991) defines ecotourism as "ecologically responsible tourism". Figgis (1992) considers ecotourism as "travel to remote or natural areas which

aims to enhance understanding and appreciation of the natural environment and cultural heritage while avoiding damage or deterioration of the experience for others. These early definitions did not emphasise nature conservation or ecological sustainability.

The subsequent definitions gradually emphasised nature conservation, ecological sustainability and the sustainability of local communities explicitly as additional objectives of ecotourism. The fifth congress on national parks and protected areas (1992) defined ecotourism as "responsible travel to natural areas that sustains the well-being of local people and conserve the environment". The most comprehensive definitions are offered by Valentine (1992), Ziffer (1989), and the Audubon society. According to Valentine (1991) ecotourism is nature based tourism that is ecologically sustainable and is based on relatively undisturbed natural areas, is non-damaging and non degrading, provides a direct contribution to the continued protection and management of protected areas used, and is subject to an adequate and appropriate management regime.

According to Ziffer (1989) "ecotourism is a form of tourism inspired primarily by the natural history of an area, including indigenous cultures, the ecotourist visits relatively undeveloped areas in the spirit of appreciation, participation and sensitivity. The ecotourist practices a non consumptive use of wildlife and natural resources and contributes to the visited area through labour and financial means aimed at directly benefiting the conservation of the sites and the economic well-being of the local residents. The visit should strengthen the ecotourists appreciation and dedication to conservation issues in general and to the managed approach by any country or regions which commit itself to establishing and maintaining the sites with the participation of local residents, marketing them appropriately, enforcing regulations and using the proceeds of the enterprise to fund the areas land management as well as community development". This definition is very extensive and incorporates many conditions for ecotourism.

The national Audubon society has formulated a code of conduct for ecotourism with the following conditions:

- \* biota shall not be disturbed
- \* tourism to natural areas will be resource sustainable
- \* sensibilities of other cultures shall be respected
- \* waste disposal shall have neither environmental nor aesthetic impacts
- \* the experience that a tourist gains in travelling with audubon shall enrich his or her appreciation of nature, conservation and the environment.
- \* the effect of an audubon tour shall be to strengthen the conservation effort and enhance the natural integrity of places visited and
- \* traffic in products that threaten wildlife and plant populations shall not occur

The ecological sustainability objective began to be included since the late eighties as this concept entered into the development debate. Several Australian definitions follow the expanded definition which include sustainability, local community development and conservation. Young (1992) considers ecotourism to be tourism to natural areas that fosters environmental understanding, appreciation and conservation and sustains the culture and well being of local communities. The Ecotourism Association of Australia considers it

to be ecologically sustainable tourism that fosters environmental and cultural understanding, appreciation and conservation (ecotourism association of Australia, 1992). The National ecotourism strategy definition implies that ecotourism is nature based tourism that involves education and interpretation of the natural environment and is managed to be ecologically sustainable. This definition recognises natural environment includes cultural components and that ecologically sustainable involves an appropriate return to the local community and long term conservation of the resource (Ecotourism strategy, 1994).

It is clear that ecotourism is a multiobjective phenomenon with nature conservation being a dominant one. Nature conservation is complex and several conditions need to be satisfied to achieve conservation objectives satisfactorily. A further confusion arises due to the use of a multiplicity of terms to define ecotourism. Nature based tourism, nature tourism, ecotourism, green tourism, tip toe tourism, environmentally sustainable tourism are some of the terms used by different users (Herath, 1995).

### **Environmental Impacts of Tourism**

The spread of mass tourism has generated considerable damage to the environment. Some of these are given in Table 1. The growing concern for the health of the environment because of such damage can have direct impact for the tourism industry at such destinations where the naturalness has been reduced and the resource becomes less attractive to the tourist. It is clear therefore that if the naturalness of an attraction is damaged or reduced, the demand for the areas popularity is lost. Vulnerable ecosystems such as the coral reefs, marine organisms, wetlands and estuaries and also large mammal populations, represent a small subset of resources that can be made vulnerable to mass tourism.

Kocasoy (1995) describes how tourism degraded the water quality in tourist resorts in Turkey and emphasise that the bearing capacity of the waters should not be exceeded if such resources are to be protected. Many tourists like to see wildlife but there is obviously an impact on their welfare due to large numbers of visitors. The problems of park management in the Royal Chitwan Park in Nepal has been discussed by Mishra (1982). Duff (1993) presents the relevant impacts and benefits of ecotourism in national parks. Peter Williams (1994) describes the environmental impacts of tourism in detail. He emphasises that tourism is a highly differentiated phenomenon and that the effects of tourism cannot be described in general terms. He defines it in terms of four concepts namely ecosystem resiliency, site use intensity, development motivation and site transformation.

Ecosystem resiliency implies the ability of an ecosystem to withstand varying pressures. This ability differs across different ecosystems and the most vulnerable are the most attractive for tourism and coastal systems, montane habitats, fragile ecosystems all represent examples. Site use intensity is another factor that can affect the rate of degradation of a natural environment. The carrying capacity concept is relevant here. The facility development has to be planned and integrated in a co-ordinated fashion and otherwise such developments can infringe upon less resilient resources in natural areas.

Tourism projects developed with greater sensitivity to the environment tend to be more sustainable than situations where development strategies which are detrimental in the long run.

**Table 2 Environment-Stressing Tourism Events and Typical Associated Responses**

STRESSOR EVENT	PRIMARY ENVIRONMENTAL RESPONSE
1. Environmental restructuring <ul style="list-style-type: none"> <li>• Residential/commercial expansion</li> <li>• Transportation network expansion</li> <li>• Tourist facility development</li> </ul>	<ul style="list-style-type: none"> <li>• Change in habitat</li> <li>• Change in biological species</li> <li>• Change in visual quality</li> <li>• Change in health standards</li> </ul>
2. Waste residual generation <ul style="list-style-type: none"> <li>• Air pollution emission increase</li> <li>• Effluent discharge increases</li> <li>• Solid waste disposal increases</li> <li>• Noise level increases</li> </ul>	<ul style="list-style-type: none"> <li>• Change in natural resource pollution loadings</li> <li>• Change in health of biological organisms</li> <li>• Change in human health</li> </ul>
3. Tourist activity intensification <ul style="list-style-type: none"> <li>• Activity spatial distribution</li> <li>• Activity temporal patterns</li> <li>• Activity resource use</li> </ul>	<ul style="list-style-type: none"> <li>• Change in habitat</li> <li>• Change in biological species</li> <li>• Change in visual quality</li> </ul>
4. Shifting population structures <ul style="list-style-type: none"> <li>• Population growth</li> <li>• Population density</li> <li>• Population resource use</li> <li>• Population sociocultural mix</li> </ul>	<ul style="list-style-type: none"> <li>• Congestion increases</li> <li>• Changes in land-use demand</li> <li>• Changes in water demand</li> <li>• Changes in energy demand</li> </ul>

Source: Williams, 1994

### Carrying Capacity and Ecotourism

The concept of carrying capacity is an important one in debates about the sustainability of the natural environment for the development of tourism. There are diverse views on carrying capacity depending upon the perspective from which the problem is considered. Mainstream economists view it from orthodox principles believe that there should in fact be no limit because technology and the state of knowledge can change limits in significant ways and hence alter carrying capacity. On the other hand, ecological economists believe that "a no limit position" is untenable because ultimate limits exist to the availability of raw materials or natural resources that can be used and also limits exist to the residuals generated where the natural environment acts as the sink. The carrying capacity concept has been widely used in marine resources where the myriad of uses of the waters in marine environments have considerably degraded the environmental quality.

Much is heard now about recreation carrying capacity and often we hear the lament that the national parks have been overused or degraded and their environmental values have been destroyed. Of course there appears to be considerable sense in defining a carrying capacity concept for recreation because recreation is a phenomenon indulged in by people to maximize their experience. A commonly used definition of carrying capacity is that

character of use that can be supported over a specified time by an area developed at a certain level without causing excessive damage to either the environment or the experience of the visitor (Lime and Stankey, 1971). These definitions have undergone transformation in recent years in various contexts. A good review of twenty years of research on social carrying capacity is given by Graefe et. al. (1984).

In an ecotourism context, the recreation carrying capacity has to be viewed in several ways. The biological carrying capacity is an important one here due to the emphasis placed on nature conservation. Biological carrying capacity can be viewed from the perspective of the health of a population or a species. There is a different ability in each biological resource and natural ecosystems to withstand pressures from enhanced visitor rates. Some are highly resistant and some are extremely sensitive and the same level of recreation can create different damage levels. Biological carrying capacity also implies an acceptable amount of damage Stankey has developed the concept of Limits to Acceptable Change (LAC) for recreation. The main idea in the LAC is to identify how much of the environment can be used for tourism and how much change can be allowed to occur. The LAC procedure is based on the development of a series of steps which lead to the development of a number of desired conditions. It also identifies the actions necessary to maintain these conditions. A diagrammatic representation of the LAC process is given in Figure 1.



Figure 1.—The Limits of Acceptable Change (LAC) planning system.

## The Precautionary Principle

Ecological systems are complex and ways of dealing with these complexities and the inherent uncertainties of activities on the ecosystem need to be worked out. In assigning trump status to the environment by ecological economists, they argue that mainstream economics lacks any representation of the evolutionary nature of the ecosystems and the nonlinear causation that is characteristic of them (Christensen, 1991). Further, ecological economists argue for a precautionary principle as a way of dealing with the uncertainties that invariably characterise various activities. The precautionary principle recommends that society establishes a Safe Minimum Standard for protecting these important ecological resources. There are criticisms of the SMS based upon the difficulty of implementing such a concept (Constanza, 1994). He states that the precautionary principle offers no guidance as to what precautionary measures should be taken. The principle instructs us to save resources and avoid harmful effects but does not tell us how many resources or which adverse future outcomes are most important.

Carrying capacity or the environmental capacity concept and the precautionary principle are linked. The link emanates from the fact that the carrying capacity and the precautionary principle are two ways of thinking about the use of the environment for the disposal of waste or non consumptive uses such as ecotourism. The carrying capacity concept permits the use of the environment up to a prespecified limit for the disposal of waste or for recreation or any other anthropogenic inputs. The proponents of the precautionary principle states that the carrying capacity concept has failed because it gave a mandate for those with a vested interest to use the environment rather than protect the environment. They propose that the precautionary principle changes the whole nature of the phenomenon by emphasising a precautionary strategy which offers greater environmental protection (Stebbing, 1992). The precautionary principle has been accepted by many governments including Australia in relation to the environment. The important factor here is that the precautionary principle urges greater environmental protection and that the polluter or the user of the environment should demonstrate that their activities do not cause harm to the environment. Thus there is a shift of the burden of proof to the user of the environment rather than the environment itself. Applied to ecotourism, it implies that ecotourism practitioners should demonstrate that the tourism activities in nature-based areas do not cause harm.

## The SMS for Ecotourism

The SMS has been used by many to study the use of natural resources in many contexts (Ciriacy Wantrup, 1968; Rogers and Sinden, 1995). This section illustrates the relevance of the SMS for ecotourism following the analysis by Randall (1994). The diagrammatic illustration of the principle by Randall is given in Figure 2. Assuming  $D$  to be a renewable ecotourism resource such as an important ecosystem,  $D$  withheld from use can regenerate in the next period. If  $S_t$  is the stock of  $D$  not used for ecotourism in period  $t$ , the generation function traces the relationship between  $S_t$  and  $S_{t+1}$ . At points above the line of slope = 1,  $S_{t+1}$  exceeds  $S_t$  and the resource is sustainable and at points below it is not. If the regeneration function is above the line of slope = 1, then the market provides



the regeneration function is above the line of slope = 1, then the market provides adequate protection for the resource. However, if the curve is sigmoid, and if less than  $S_{min}$  is withheld from use, the resource will be exhausted.

Interpreting  $S_{min}$  as the minimum standard and recognising the stochastic nature of the regeneration function, the dashed curve traces a stochastic regeneration curve. Here if the SMS is withheld from use, resource exhaustion will be avoided even in the worst situation. The SMS is referred to as the minimum standard of preservation. SMS sustains the resource and  $D_{min}$  is the minimum allocation necessary to sustain consumption. Any generation using less than  $D_{min}$  will suffer deprivation. SMS is the minimum stock necessary to be withheld from production to ensure  $D_{min}$  for each succeeding generation. SMS is the safe minimum standard of conservation. According to Randall (1994) the Safe minimum standard should be  $\hat{SMS}$ , which is a more conservative model than often required. Interpreting this analysis from an ecotourism perspective, it states that if ecotourism ventures degrade a given resource below  $\hat{SMS}$ , the venture cannot be permitted from a sustainability perspective.

### Concluding Remarks

This paper illustrates the usefulness of the SMS concept in ecotourism ventures. Ecotourism emphasises nature conservation and the need to ensure the survival of important natural resources dictates that a SMS policy be adopted. This is conditioned by the high uncertainty of the impact of tourism on fragile natural resources and the irreversibility of such adverse impacts. The actual implementation of the concept is difficult but this paper illustrates the basic principles involved in initiating any programs where the use of the SMS is envisaged.

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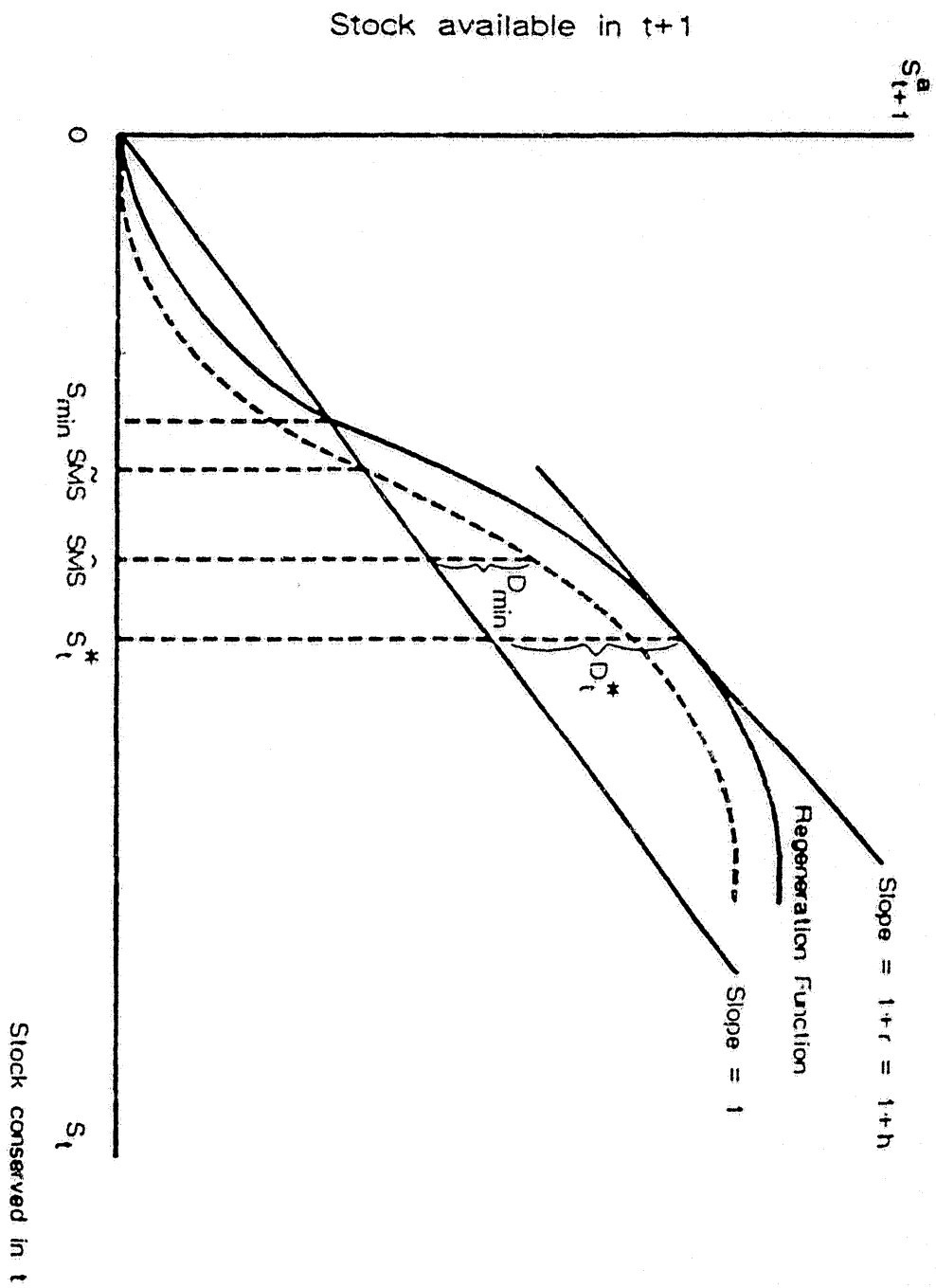


Figure. 2 Setting the SMS