

**THE DEVELOPMENT OF A SUSTAINABILITY
MANAGEMENT SYSTEM FOR SKI AREAS**

by

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ABSTRACT

Ski areas worldwide are increasingly offering more diverse services and activities. This can lead to significant levels of environmental degradation and social challenges for local communities. This study identifies the key components of a sustainability management system (SMS) for ski areas. Bláfjöll ski area, in Iceland, was chosen as a case study. Qualitative personal interviews were conducted with the operators of Bláfjöll and their stakeholders, in order to identify the sustainability issues to be addressed in the SMS. They also provided suggestions regarding what strategies should be taken in order to implement the proposed SMS.

A literature review provided a description of sustainability management concerns associated with ski area operation. It also provided environmental management frameworks for ski areas. Existing literature on social management concerns of ski areas, focuses mainly on growth problems and issues related to resort communities.

Research findings suggest that a ski area SMS should also address broader community benefits that are potentially associated with the operation, as well as issues associated with visitor enjoyment and safety. The findings suggest that collaborative stakeholder relationship between ski area operators and their stakeholders should be a key component of a ski area SMS. Sustainable management of ski areas can be achieved through stakeholder collaboration with government organizations, non governmental organizations, visitors, and local private businesses. These stakeholders can help the ski area operators to identify and address site specific sustainability issues.

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TABLE OF CONTENTS

Approval	ii
Abstract	iii
Acknowledgements	iv
Table of Contents	v
List of Figures	viii
List of Tables	ix
Chapter 1: Introduction	1
1.1 Overview.....	1
1.2 Rationale for the study	2
1.3 Research goals and questions	4
1.3.1 Research goals	4
1.3.2 Research questions	5
1.4 Methods	5
1.4.1 Literature review.....	5
1.4.2 Case study of Bláfjöll, ski area.....	6
1.5 Report organization.....	6
Chapter 2: Literature Review	7
2.1 Rationale and organization	7
2.2 Sustainable development	8
2.3 Corporate environmentalism.....	10
2.3.1 Stakeholders and collaboration.....	12
2.4 Sustainable destinations.....	15
2.4.1 Tourism and recreation.....	15
2.4.2 Sustainable tourism development.....	16
2.4.3 Protected areas and outdoor recreation.....	18
2.5 Environmental and sustainability management systems	24
2.5.1 Definitions	24
2.5.2 Components and use of EMS	25
2.5.3 Historical development and rationale of EMS	26
2.5.4 Sustainability management systems	27
2.6 Impacts and other management concerns of ski area operation and development.....	29
2.6.1 Environmental impacts and management concerns.....	30
2.6.2 Socio-cultural and economical impacts and management concerns	32
2.7 Sustainability management in the ski area industry.....	33
2.7.1 Rationale for sustainable ski area management.....	33
2.7.2 Environmental management system for ski areas	35

2.7.3	Sustainability practices of ski areas.....	37
2.7.4	Stakeholders in ski area management.....	43
2.8	Literature summary.....	51
Chapter 3:	Research methods.....	53
3.1	Overview.....	53
3.2	Research goals and questions	53
3.2.1	Research goals	53
3.2.2	Research questions	54
3.3	Literature review.....	54
3.4	Case study.....	55
3.4.1	Case study rationale.....	55
3.4.2	Qualitative interviews.....	57
3.4.3	Other data	60
3.5	Data analysis.....	60
3.6	Research design strengths and limitations.....	61
Chapter 4:	Case study findings.....	63
4.1	Introduction.....	63
4.2	Background.....	63
4.2.1	Bláfjöll - overview.....	63
4.2.2	History and development of Bláfjöll	65
4.2.3	A vision for Bláfjöll developed	66
4.2.4	Management structure and legislation.....	68
4.3	Management concerns	72
4.3.1	Environmental impacts and management concerns.....	72
4.3.2	Social impacts and management concerns	78
4.3.3	Physical management constraints.....	81
4.4	Sustainability management practices.....	82
4.4.1	Environmental management practices.....	83
4.4.2	Social management practices.....	84
4.4.3	Collaborative stakeholder relationship	86
4.5	Improving sustainable management practices	91
4.5.1	Environmental management practices.....	92
4.5.2	Social management practices.....	94
4.5.3	Future development and operation	95
4.6	Summary.....	96
Chapter 5:	Management implications.....	98
5.1	Introduction.....	98
5.2	Themes.....	98
5.2.1	Environmental impacts	98
5.2.2	Social concerns	99
5.2.3	Moving towards sustainability by stakeholder collaboration	101
5.3	The ski area SMS model.....	102
5.3.1	Application of the model	103
Chapter 6:	Conclusions	119

6.1 Summary of conclusions.....	119
6.2 Areas for future research.....	124
Appendix A: Ethics approval	127
Appendix B: Potential environmental effects of ski area development and operation.....	128
Appendix C: Interviewed parties	131
Appendix D: Interview guiding questions	133
Reference List.....	137

LIST OF FIGURES

Figure 1. Three foundations of sustainable development.....	8
Figure 2. Firm impacts on society.	10
Figure 3. A stakeholder model of the corporation.....	14
Figure 4. The relationship between leisure, recreation, and tourism.	16
Figure 5. Successful partnership between stakeholders can benefit all parties involved and improve quality of life in local communities.	18
Figure 6. A SMS based on the Natural Step (TNS) framework.....	28
Figure 7. A model for the greening of ski resorts.	47
Figure 8. Bláfjöll ski area and Country Park and surrounding municipalities.	56
Figure 9. Management structure of Bláfjöll Country Park and ski area.....	70
Figure 10. Bláfjöll’s key stakeholders and their contribution to environmental, social, and economic sustainability.....	106

LIST OF TABLES

Table 1. Management objectives of IUCN category V protected areas, protected landscapes/seascapes.....	19
Table 2. A new paradigm for protected areas.	19
Table 3. Elements and components of the ski area EMS model.....	36
Table 4. Sustainable Slopes, implemented principles in 2002.....	40
Table 5. Components of an environmental audit for ski areas.....	43
Table 6. Stakeholders of a winter sport destination.	44
Table 7. Advantages and disadvantages associated with the ski area operation as perceived by the operators and selected stakeholders.....	66
Table 8. Sources and implications of various ski area related impacts on ground water resources in Bláfjöll.	75
Table 9. Elements and components of the ski area EMS model.....	103

CHAPTER 1: INTRODUCTION

1.1 Overview

Tourism has become a powerful force in transforming the physical, socio-cultural and economical environment of destinations. At the same time, tourism has been viewed as a vehicle for providing and stimulating sustainability in communities (IUCN 2002; WTO 1993). Sustainable tourism in this context, can be viewed as a model form of economic development that is designed to (WTO 1993):

- improve the quality of life in host community;
- provide a high quality of experience for visitor; and
- maintain the quality of the environment on which both the host community and visitor depend.

Ski area operators have faced increasing pressure to incorporate sustainability strategies into their business, because their development and activities can lead to significant levels of environmental degradation and social challenges for local communities (Gill 1991; Hudson 2000; Todd and Williams 1996; Williams and Todd 1997). As a consequence, a growing number of operators are incorporating formal environmental management system (EMS) frameworks into their operations. More recently, a few have shifted their focus to the creation of sustainability management systems (SMS).

In this study, a SMS is developed for Bláfjöll ski area in Iceland. The SMS is developed based on the expressed priorities of local stakeholders and existing literature

on this subject. It aims to guide ski area managers and their operations in directions which generate more sustainable benefits for these businesses and their stakeholders.

1.2 Rationale for the study

Many ski areas around the world are becoming multi season destinations with diverse activities and services, creating greater potential environmental and social problems in destinations (Federspiel 1991; Gill 1991; Hudson 2000; Todd and Williams 1996; Williams and Gill 1999; Williams and Todd 1996). Such environmental problems include negative impacts on forests, soil, vegetation, water resources, wildlife and scenic beauty (Todd 1994; Wilde 1998). Local resort communities experience negative social impacts, often related to their rapid growth (such as lack of basic community facilities and services, and loss of cultural identity) (Gill 1991; Messerli and Ives 1997; Williamson 1991).

Ski area operators are facing pressure from government agencies, non-governmental organizations (NGOs) and the public, which reflects the negative social and environmental impacts of ski areas (NSAA 2003). This pressure, and the opportunities that exist for increasing benefits that accrue to communities and ski area operators, have heightened awareness of the need for more systematic frameworks for managing ski areas in sustainable ways. Ski area operators are increasingly taking principles of sustainable tourism development into their planning and operating decisions. However, the actions they take tend to focus primarily on addressing environmental issues and neglect social issues (NSAA 2000; Todd and Williams 1996). Todd and Williams (1996) noted that ski area operators need to improve their environmental management performance. They provided an EMS, which was designed to systematically guide ski areas in improving

their environmental performance. While their proposed EMS did not include social and cultural considerations, Todd and Williams (1996) noted that tourism developments might be the right arena for transforming EMS into sustainability management system (SMS). Their rationale was that the tourism planning and management practices had a tradition of considering the social and cultural effects of such forms of development.

The need for a SMS for the Bláfjöll ski area is evident for several reasons. Firstly, the ski area is located on a protected area, and thus management approaches for the ski area's operations within this specific zone are required. Secondly, it is located in a Water Conservation Area that supplies communities in the area, including the country's capital city, with fresh water. Research suggests that ski area activities are causing an increased risk of polluting the area's fresh water supply (Línuhönnun 2000). Thirdly, community benefits are important outcomes in the operation of the area (ITR 2001). It has been recognised that protected areas intended for recreational purposes, like Bláfjöll, might be an appropriate vehicle for contributing to the sustainability of nearby communities (IUCN 2002). Finally, safety and visitor management systems are increasingly becoming an issue in this destination. The operators of the ski area recently created a vision for the area until the year 2008 (ITR 2001). The vision includes creating a new management performance system for the area. The implementation of the vision's principles within a sustainability management system become particularly important in this case, as the future development plans for the area include reconstructing the ski area and making it into a four season multiple use destination.

According to Todd and Williams (1996), there are several reasons for ski areas to develop and implement a system for sustainable management. These include: rising levels of environmental conflict; building positive business images; reducing environmental

accidents; complying with codes, regulations and laws; and creating competitive advantages associated with lower operational costs. The literature suggests that in order to be managed in a sustainable fashion, problems associated with ski area operations need to be solved and prevented through collaboration with stakeholders. Strong collaborative relationships between destination managers and stakeholders are now believed to be a key for destinations to succeed. Such relationships can benefit different stakeholders of the ski area and improve the quality of life for local communities.

This research focuses on how the ski area can work more closely with local stakeholders and how this ski area and its nearby communities can benefit from improved stakeholder relationships associated with the implementation of a comprehensive SMS. Thus, this research goes beyond problems and issues of environmental and social sustainability in resort communities typically emphasised in the literature (Federspiel 1991; Gill 1991; Holden 1998; Holden 1999; Tuppen 2000; Williamson 1991; Wingle 1991; Williams and Gill 1999). In the context of this study, an SMS provides a systematic framework, for improving environmental, economic, and social sustainability performance.

1.3 Research goals and questions

1.3.1 Research goals

The research project has two main goals. The first goal is to identify key components of a SMS for ski areas, based on a literature review of existing sustainability practices, as well as typical issues and problems associated with ski areas in North America and Europe.

The second goal is to develop a workable SMS for Bláfjöll ski area, based on the

framework established by activities linked to the first goal and stakeholder input from the case study region.

1.3.2 Research questions

The research questions of this study are:

- What are the key components of a SMS for ski areas?
- What are the key components of a SMS for Bláfjöll ski area?
- What strategies must be taken in order to implement a SMS in Bláfjöll ski area?

1.4 Methods

Two methods are employed in this study: a literature review and a case study of Bláfjöll.

1.4.1 Literature review

The literature review provides the context and theoretical components for SMSs in ski areas and the potential elements of a framework for an SMS for the Bláfjöll ski area. The literature review discusses sustainability practices, as well as the environmental, social and economic issues associated with developing more sustainable forms of ski area development. In particular the literature review focuses on identifying stakeholders, and rationalizing the need for them in developing and supporting sustainability management systems for ski areas. The literature also contextualizes the research by identifying key issues associated with the management of protected areas, and indicating how communities can benefit from outdoor recreation activities such as skiing in such areas.

1.4.2 Case study of Bláfjöll, ski area

The second part of the research involves the preparation of a case study of the Bláfjöll ski area. In the case study, an SMS for Bláfjöll is created. It is based on information collected from both primary and secondary sources. The secondary data include not only the preceding literature, but also information about current management issues in the area. This information is provided by key stakeholders as well as previous studies done on the area. The primary data collected is based on information from operators and other stakeholders that was collected via semi structured personal interviews. Key informants were interviewed in order to identify the ski area's stakeholders, the SMS components, and potential strategies for implementing the proposed SMS.

1.5 Report organization

This research report is divided into six sections. Chapter one has summarised the focus and organisation of the study. Chapter two reviews relevant areas of literature for this study, and includes a discussion on components of SMSs for ski areas. Chapter three describes the methods used to collect the data needed for the research. It discusses the stakeholder approach which is used in this study, and identifies how stakeholder interviews were conducted. Chapter four introduces the findings from the stakeholder interviews, including those associated with identifying the key components of the actual SMS for Bláfjöll. Chapter five outlines management recommendations for the implementation of the proposed SMS. Chapter six provides a summary of the conclusions of the study, as well suggests areas of further research linked to them.

CHAPTER 2: LITERATURE REVIEW

2.1 Rationale and organization

This literature review provides necessary information for identifying key components of a sustainability management system (SMS) for ski areas. The review extends beyond ski areas and explores some of the broader issues of sustainability that have not been discussed much in the context of such development.

The first section briefly introduces the concept of sustainability and what components are typically included in sustainability models. The second segment of the literature review examines corporate environmentalism and the role of stakeholder collaboration in such initiatives. The third part explores the concept of sustainability in the context of tourism, outdoor recreation and protected areas. In particular, it highlights the importance of stakeholders in shaping successful destination management activities linked to sustainability. The fourth section introduces the concept of environmental and sustainability management systems (EMS). It discusses EMS principles and their application. Section six summarizes negative impacts and other management concerns associated with ski areas. This section is important because one of the primary goals of EMS is to minimise negative impacts and risk. The seventh component of the literature review discusses sustainability management in the North American and European ski area industry. The final component of the literature review presents a summary of the key findings that serve to focus and guide the research that ensues.

2.2 Sustainable development

The concept of sustainable development is becoming widely accepted as a foundation for the future of many regions (Mitchell 2002). Principles of sustainable development have been widely adopted in resource management by international organisations, national and local governments, and business. The World Commission on Environment and Development, also referred to as the “Brundtland Commission”, defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987, 8). Sustainable development has environmental, social, and economic dimensions that are linked to each other. Consequently, the achievement of environmental, social and economic objectives depend on each other, and a threat to any one of them impacts the others (Figure 1) (CORE 1995; Fraser Basin Management Program et al. 1995).

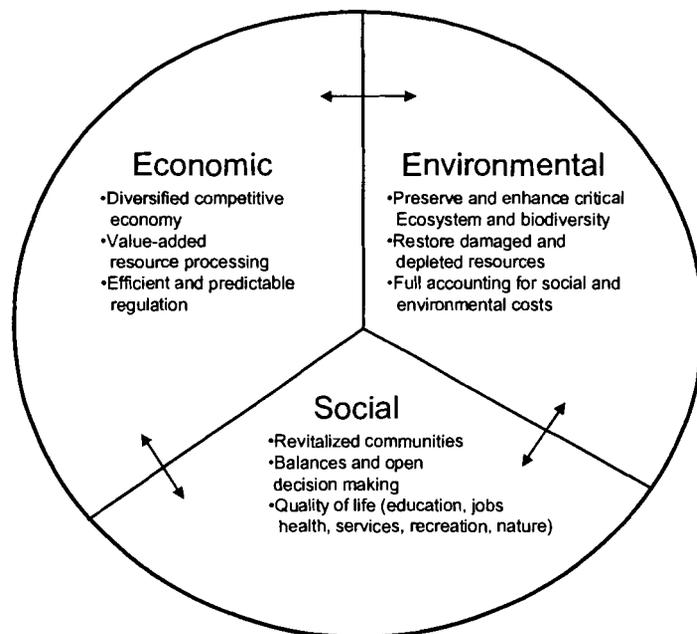


Figure 1. Three foundations of sustainable development.
Source: adapted from Fraser Basin Management Program et al. (1995).

The Brundtland Commission identified seven critical objectives for environment and development policies (WCED 1987):

- reviving growth;
- changing the quality of growth (emphasising quality rather than growth);
- meeting essential needs for jobs, food, energy, water and sanitation;
- ensuring a sustainable level of population;
- conserving and enhancing the resource base;
- re-orienting technology and managing risk; and
- merging environment and economics into decision making.

Since then, considerable effort has been devoted to developing guidelines or principles for achieving these objectives. However, implementing these generally accepted principles and guidelines has been challenging, largely because economic and social systems, as well as ecological conditions, vary greatly among countries and regions (Mitchell 2002). The World Conservation Union, United Environment Programme, and World Wide Fund for Nature identified several key principles for creating a more sustainable living environment and a more sustainable society (IUCN, UNEP, and WWF 1991). These principles are:

- respect and care for the community of life;
- improve the quality of human life;
- conserve the Earth's vitality and diversity;
- minimize the depletion of non-renewable resources;
- keep within the Earth's carrying capacity;
- change personal attitudes and practices;
- enable communities to care for their own environments;
- provide a national framework for integrating development and conservation; and
- create a global alliance.

A recommended way of implementing these principles is to move away from traditional forms of environmental and resource management practices, which have been dominated by technical experts in government and the private sector, and focus on approaches that include the experience, knowledge, and understanding of various local groups and people (Gunton et al. 2003; Mitchell 2002). Stakeholder consultation and involvement in decision making has become one of the key components of sustainability.

2.3 Corporate environmentalism

All firms have environmental, social, and economic impacts. Marsden and Andriof (1998) identify those impacts and argue that firms have a ripple effect on society, as Figure 2 illustrates.

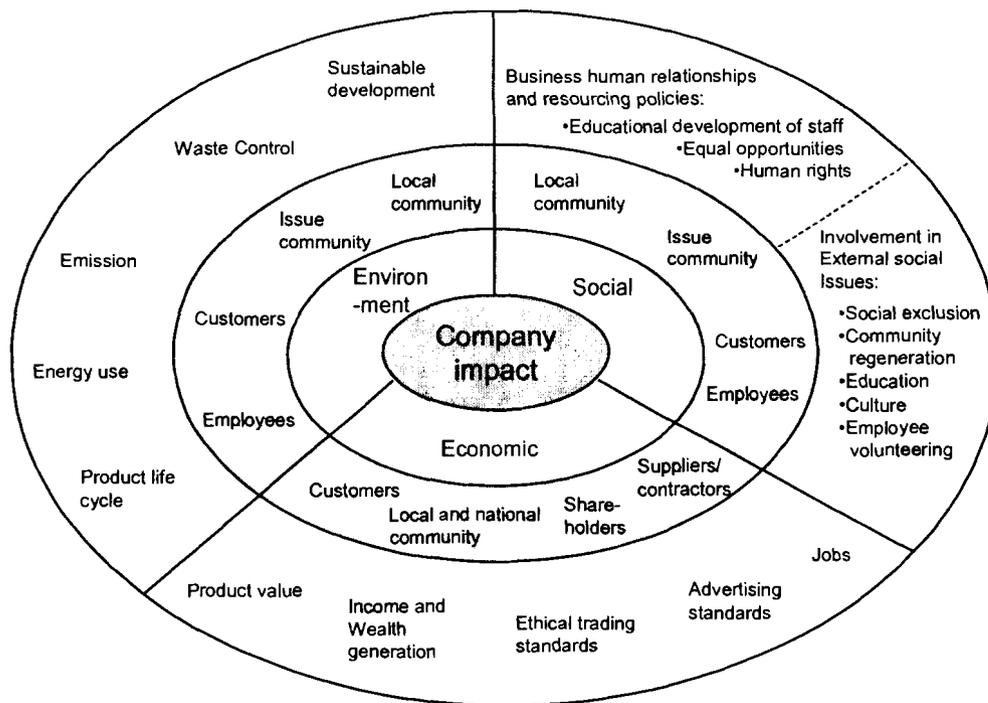


Figure 2. Firm impacts on society.
Source: adapted from Marsden and Andriof (1998).

Corporations are increasingly addressing their effects. In the 1960s and 1970s the general business practice was coping with environmental crises as they occurred. In the 1980s companies struggled to comply with stricter governmental regulations and minimised the costs of compliance. The 1990s introduced a period of proactive environmental management strategy. Then corporations began to reduce waste and pollution in advance of regulation. They also realised the business advantage of incorporating environmental management (Berry and Rondinelli 1998). Over these decades the concept of sustainability has gradually expanded to include the simultaneous consideration of economic growth, environmental protection, and social equity in business planning and decision making (Schmidheiny 1992). As a business goal, sustainability has been driven by the fact that the economy and environment are linked, and nature's laws create restrictions and limitations with major economic consequences (Burns 2000). It has even been suggested that corporations that do not emphasise proactive environmental approaches will not be competitive in the global economy in the 21st century (Berry and Rondinelli 1998). The shift towards proactive environmental management has also been driven by pressures from government, customers, employees, and competitors. Research by Rondinelli and Berry (2000) shows that multinational corporations see immediate business benefits from proactive environmental management and promotion of sustainable development in the form of lower costs, less risks and liabilities, and more efficient operations. Many companies also perceive longer-term returns from promoting sustainable development, including stronger competitive advantage, preservation of crucial resources, favourable corporate image, and opportunities for new product development.

The literature on corporate environmentalism especially focuses on the concepts of corporate citizenship and corporate social responsibility. These concepts are defined broadly and used interchangeably. They suggest a more integrated approach to a company's existence in society (i.e. that companies are part of, not separate from, society) (Andriof and Waddock 2002). Marsden and Andriof (1997) contend that corporate citizenship involves managing the relationship of an organization in order to minimise negative impacts and maximise positive benefits. Post et al. (2002) however, state that corporate citizenship refers to business acting responsibly toward their stakeholders. Corporate social responsibility on the other hand encompasses a company's commitment to operate in an economically and environmentally sustainable manner, while recognizing the interests of its stakeholders (CBSR 2001). It considers issues beyond narrow economic, technical, and legal requirements of the firm, to accomplish social benefits along with the traditional economic gains which the firm seeks (Davis 1973). The rationale for stakeholder involvement for firms is further discussed in next section.

2.3.1 Stakeholders and collaboration

Freeman (1984) has defined a stakeholder in an organisation as "any group or individual who can affect or is affected by the achievement of the organisation's objectives". This is a broad definition, but Freeman also defines stakeholders as primary or secondary, depending on an assessment of whether they are immediately affected by, or can immediately affect, a firm's operations. Mitchell et al. (1997) argue that a broad definition is used by researchers concerned with a stakeholder interest based on power relations, while a narrow definition is used by researchers focusing on the legitimacy of claims. According to Flagestad (2001), a narrow definition of a stakeholder is required for

measurement purposes. It has been argued that the definition of a stakeholder should include any naturally occurring entity which can affect or can be affected by organisational performance (Clarkson 1994; Starik 1993). It could for example include the non-human natural environment, past or future generations, non-living objects, or non-physical mental emotional constructs. In much management practice however, Freeman's approach is believed to hold (Bendell 2003).

The need for sustainable development has added pressure to increase participation in business decisions. A study by Robbins (2003) shows that collaborative relations with stakeholders are vital if business want to operate in a sustainable way. Collaborative approaches in managing conflict encompass a range of methods where parties with a stake in the problem actively seek a mutually determined solution (Gray 1989).

Collaboration differs from compromise, where involved parties do not get what they want, and hence the conflict occurs again and again in some other form (Svendsen 1998). Collaboration focuses on problem-solving, and it attempts to get the parties to focus on identifying the issues underlying their disputes, treat them as a mutual problem and solve them collectively (Robbins 2003; Weitzman and Weitzman 2000). Driscoll (1996) has argued that, as competitive conflict over natural resources increases, consensus-based collaborative initiatives are increasingly being chosen as an alternative to traditional conflict resolution and problem solving of complex social issues. Consequently, business and communities are moving from discussions of rights to interests, and from forcing to negotiation (Isenhardt and Spangle 2000). Stakeholder engagement is becoming an important aspect of many companies' business strategy and stakeholders of corporations have gained an increasing force in corporation management strategies (Andriof and Waddock 2002; Berry and Rondinelli 1998). The goal is often to balance concerns with

cash flow, profitability, and environmental protection in order to satisfy its increasingly diverse stakeholders (Berry and Rondinelli 1998).

Studies suggest that corporations should consider the interests of their stakeholders, for ethical reasons (e.g. Freeman 1984; Donaldson and Preston 1995; Williams and Budke 1999), or for the achievement of strategic or economic objectives (e.g. Jones 1995; Frooman 1999). The fundamental assumption in stakeholder theory (Figure 3) is that there exists a relationship between the firm and the stakeholder that is based on some mutual interest (Freeman 1984). According to the stakeholder theory, a company is granted a licence to operate by virtue of its social contract with stakeholders, and society will allow the company to operate as long as it sees a benefit of the company (Robson and Robson 1996).

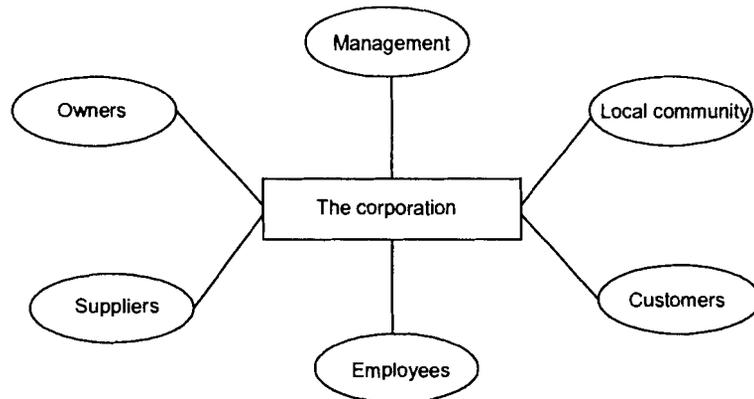


Figure 3. A stakeholder model of the corporation.
Source: adapted from Freeman (1984).

This section has summarized the rationale for firms to incorporate sustainability management strategies in their business decisions. In particular, it highlights the importance of stakeholder collaboration in implementation of sustainability practices.

2.4 Sustainable destinations

This section explores principles and benefits for managing tourism, outdoor recreation, and protected areas in a sustainable way.

2.4.1 Tourism and recreation

The concepts of tourism, recreation and leisure have been defined in a number of different ways. Crompton and Richardson (1986) have noted that tourism has been regarded as a commercial economic phenomenon rooted in the private domain, while recreation and parks has, in contrast, been viewed as a social and resource concern rooted in the public domain. Studies on outdoor recreation have focused on public sector concerns, such as wilderness management, social carrying capacity, and non-market valuation of recreation experiences. According to Driver et al. (1991), recreation refers to behaviour that people engage in voluntarily for their intrinsic reward during times when they are not committed to meeting survival needs or other social obligations.

Consequently, recreation has values for both the individual and society. International organizations, such as the World Tourism Office, describe tourism as travel that involves a stay of at least one night, but less than one year from home (Shaw and Williams 1994).

Figure 4 illustrates the overlap between tourism and recreation.

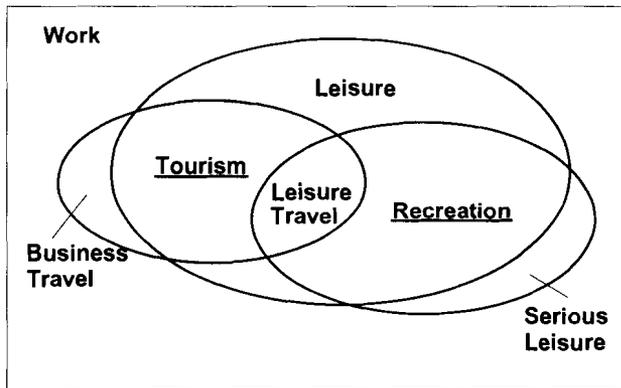


Figure 4. The relationship between leisure, recreation, and tourism.
Source: adapted from Hall and Page (1999).

Research on the sustainability of ski areas should thus include literature on outdoor recreation and tourism. This study includes both of those.

2.4.2 Sustainable tourism development

The tourism industry has emerged as one of the world's major industries over the last few decades (WTO 1993; WTTC 1995). At the same time tourism has widespread environmental, social, and economic consequences (e.g. Butler 2000; Eber 1992; Crandall 1994; WTO 1993). Tourism, more than many other activities, depends on the presence of high quality human and natural environment and resources. Tourism must be environmentally sustainable in order to be economically sustainable (WTO 1993).

Consequently, protecting the environment and achieving successful tourism development are inseparable. The guiding principle for sustainable tourism development is to “manage the natural and human resources so as to maximise visitor enjoyment and local benefit while minimizing negative impacts upon the destination site, community and local population” (WTO 1993, 107). Eber (1992) has suggested 10 principles of sustainable tourism development. In summarized form they involve:

- using resources sustainably;

- reducing over-consumption and waste;
- maintaining diversity;
- integrating tourism into planning;
- supporting local economies;
- involving local communities;
- consulting stake-holders and the public;
- training staff;
- marketing tourism responsibly; and
- undertaking research.

The literature highlights the importance of stakeholder consultation and community involvement in shaping and guiding sustainable tourism development. Different parties - including the public and private sectors, NGOs, and tourists - share interests and goals, and by becoming involved they are more apt to be responsible in their roles. Through cooperation and productive interaction, the parties can benefit and achieve an improved quality of life (Figure 5) (WTO 1993). Stakeholder involvement is further discussed in the context of ski areas in section 2.7.4.

The tourism industry is increasingly recognising and putting into practice principles of sustainable development (Eber 1992; NSAA 2000; Todd and Williams 1996; Williams and Budke 1999). At the same time, tourism is also increasingly being viewed as a vehicle that drives communities in a sustainable direction (IUCN 2002; WTO 1993).

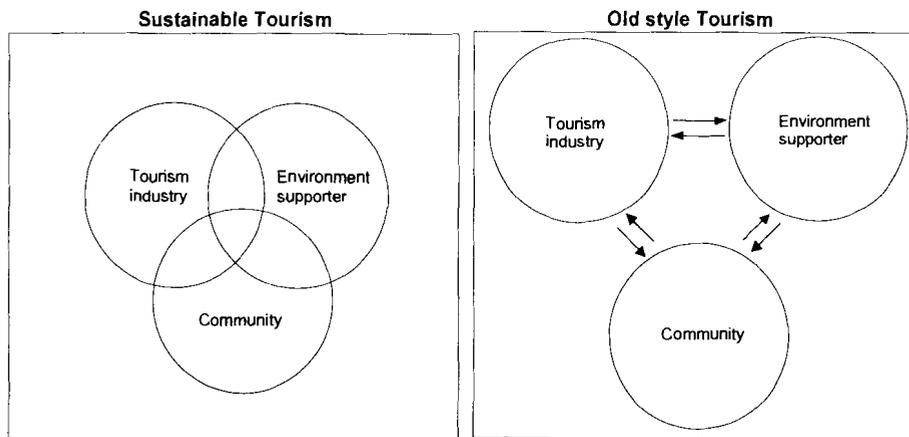


Figure 5. Successful partnership between stakeholders can benefit all parties involved and improve quality of life in local communities. Source: adapted from WTO (1993).

The principles of sustainable tourism include all three pillars of sustainability, environmental, social, and economic. Consequently, they were considered in the development of the ski area SMS model.

2.4.3 Protected areas and outdoor recreation

The World Commission on Protected Areas of The World Conservation Union (IUCN) defines a protected area as “an area of land /or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means” (IUCN 1996). IUCN has defined six categories of protected areas, which give priority to different values. Table 1 summarizes management objectives of IUCN category V protected areas, protected landscapes/seascapes.

Table 1. Management objectives of IUCN category V protected areas, protected landscapes/seascapes.

Management Objective	Weight of objectives
Scientific research	2
Wilderness protection	-
Preservation of species and genetic diversity	2
Maintenance of environmental services	2
Protection of specific natural/cultural features	1
Tourism and recreation	1
Education	2
Sustainable use of resource from natural ecosystems	2
Maintenance of cultural/traditional attributes	1

Key: 1, Primary objective; 2, Secondary objective; 3, Potentially applicable objective; -, not applicable.
Source: adapted from IUCN (1994).

Beresford and Philips (2000) have summarized the shift that has occurred in the management of protected areas in recent years (Table 2). The summary shows that protected areas have become much more diverse and more values have been identified.

Table 2. A new paradigm for protected areas.

As it was: Protected areas were...	As it is: Protected areas are...
<ul style="list-style-type: none"> • Planned and managed against people • Run by central government • Set aside for conservation • Managed without regard to local community • Developed separately • Managed as islands • Established mainly for scenic protection • Managed mainly for visitors and tourists • Managed reactively within short timescale • About protection • Viewed primarily as a national asset • Viewed exclusively as a national concern 	<ul style="list-style-type: none"> • Run with, for, and in some cases by, local people • Run by many partners • Run also with social and economic objectives • Managed with local people more in mind • Planned as part of national, regional, and international systems • Developed as “networks” (strictly protected areas buffered and linked by green corridors) • Often set up for scientific, economic, and cultural reasons • Managed with local people more in mind • Managed adaptively with long-term perspective • Also about restoration and rehabilitation • Viewed also as a community asset • Viewed also as an international concern

Source: adapted from Beresford and Philips (2000).

It is now recognised that in order to succeed, protected areas need to be planned with local people (Beresford and Philips 2000; IUCN 2002). Protected areas influence the quality of life for individuals and communities. As a result the community members have

a role in achieving the goals of sustainable development (Manning 1999; Manning and More 2002). Geoghegan and Renard (2002) suggest several key points for community involvement in planning and management of protected areas:

- Effective management requires the integration of the full diversity of stakeholders, and takes into account the differing ways they are impacted by and impact upon protected areas.
- The long-term success of participatory management depends on the suitability of the institutional arrangements.
- Given the limited resources available for protected area management, transparent processes of negotiation are required to determine how much participation is possible and what objectives are given priority.
- Participatory management of protected areas must yield appreciable benefits for local communities.

The IUCN (2002) has provided management guidelines for category V protected areas (i.e. areas protected mainly for landscape/seascape and recreation). The guidelines include 12 principles for management of category V protected areas:

1. Conserving landscape, biodiversity, and cultural values are at the heart of the Category V protected area approach.
2. The focus of management should be on the point of interaction between people and nature.
3. People should be seen as stewards of the landscape.
4. Management must be undertaken with and through local people, and mainly for and by them.
5. Management should be based on co-operative approaches, such as co-management and multi stakeholder equity.
6. Effective management requires a supportive political and economic environment.
7. Management of Category V protected areas should not only be concerned with protection but also enhancement.

8. When there is an irreconcilable conflict between the objectives of management, priority should be given to retaining the special qualities of the area.
9. Economic activities that do not need to take place within the Protected Landscape should be located outside it.
10. Management should be business-like and of the highest professional standard.
11. Management should be flexible and adaptive.
12. The success of management should be measured in environmental and social terms.

The IUCN guidelines emphasise the importance of the “people dimension”, and suggest that stakeholders should be consulted in planning of category V protected areas. These stakeholders include (IUCN 2002): government agencies (with responsibilities for natural conservation, cultural heritage, tourism, natural resources, regional development etc.), academic of science, NGOs (with interests in conservation of nature and cultural heritage), local government bodies, other community leaders, resource users, these with rights in the area (e.g. landowners), those with an economic interest, and those with knowledge relevant to the area.

The literature on protected areas and outdoor recreation provides valuable information for developing a ski area SMS, because it discusses community involvement and benefits. The sustainability principles presented in this section are valuable also for ski areas that are not located in protected areas, if their ultimate goal is sustainability.

2.4.3.1 Benefits of outdoor recreation

Recently, conceptual and empirical work has begun to focus on the broader off-site benefits that are associated with the recreational use of sites (e.g. Anderson et al. 2000; Bruns et al. 1994; Driver et al. 1991; Manning 1999; Manning and More 2002; Stein and Lee 1995). Driver et al. (1991) refer to benefit in this context as an advantageous change,

an improved condition, or a gain to an individual, a group, society, or another entity.

Manning (1999), Manning and More (2002) and Anderson et al. (2000) divide benefits of recreation and leisure into personal, societal, economic, and environmental benefits.

Recreational and leisure benefits have also been described in terms of physiological and psychological benefits (Driver et al. 1991). Research by Anderson et al. (2000) shows that communities benefit from recreation through:

- increased sense of community pride;
- increased identity for the areas surrounding the recreational site;
- employment;
- increased community sensitivity to environmental issues and places to preserve/conservate various natural and unique ecosystems in larger natural areas.
- increased family satisfaction;
- interactions, and stability;
- enhanced leadership skills among young people; and
- a sense of attachment of belonging to the community.

The same research shows that individuals benefit from outdoor recreation through:

- enjoyment of natural scenery;
- getting away from the usual demands of life;
- learning more about nature;
- keeping physically fit; and
- experiencing solitude.

According to Kline (1997), sustainable communities have four overriding characteristics: economic security, ecological integrity, quality of life and empowerment with responsibility. Hart (1995) describes sustainable communities as those which maintain and improve the economic, environmental and social characteristics of an area and

provide its members with an opportunity to continue to lead healthy, productive, enjoyable lives. Indicators of quality of life for individuals and communities include, among other things: a sense of belonging, education, availability of recreational opportunities, health and clean physical environments (Norris 1993). Recreation, which is a higher-level socio-cultural necessity, is also an important component of social sustainability (Brown et al. 1987).

Recreation has taken on increasing importance to the well being of both individuals and society (Manning and More 2002). Studies in Norway, Sweden and Canada show how outdoor recreation contributes to quality of life (The Parks and Recreation Federation of Ontario 1992; State of the Environment, Norway 2001; Hörnsten 2000). They for example show that children that participate in outdoor recreation develop better physical skills, have more physical and mental energy, more self-confidence and are happier than children that do not participate in outdoor recreation. Consequently, governments now increasingly view outdoor recreation as an important element to achieve sustainable development (State of the Environment, Norway 2001). Manning and More (2002) point out that parks are publicly important because they provide recreation services that the market cannot distribute equally. Manning (1999) argues that the public sector can be justified in acting when the market fails to produce sufficient quantities of something that is viewed to be positive.

Benefits of outdoor recreation are significant for this research, because a SMS should both aim at minimizing negative impacts associated with ski area operation as well as maximizing positive benefits.

2.5 Environmental and sustainability management systems

This section introduces the concepts of environmental management system (EMS) and sustainability management system (SMS). EMS in the context of ski areas is further discussed in section 2.7.2.

2.5.1 Definitions

An EMS provides a framework for organizations to effectively manage their environmental performance in a manner that is pro-active, continuing and systematic (Hunt and Johnson 1995). It helps ensure that major environmental risks and liabilities are properly identified and minimized; at a minimum it can help to ensure that operations are conducted in compliance with environmental laws. An EMS includes a management structure for setting and achieving environmental objectives for activities, products, or services, and demonstrates how the objectives can be achieved (Hunt and Johnson 1995). The International Organization for Standardization (ISO) defines an EMS as: “that part of the overall management system which includes organization structure, planning activities, responsibilities practices, procedures, progresses, and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy” (ISO 2004). ISO provides a voluntary EMS framework for organizations, the ISO 14001 standard (ISO 2004). The fundamental principle of the ISO 14001 standard is that organizations set their own goals, based on whatever considerations they wish to include in their management system. The standard provides a framework to develop plans in order to meet those goals, and to produce information about whether or not they are met.

The Canadian Standards Association (CSA) and the British Standards Institute (BSI) define an EMS as “the organizational structure, responsibilities, practices,

procedures, processes and resources for implementing environmental management” (BSI 1992, 4; CSA 1993, 14). Other definitions focus on what an EMS does, rather than what it contains (Abbot 1992; Davies and Rusko 1993). Based on these definitions, Todd (1994) concludes that EMS are:

- concerned with the environmental management of individual organizations;
- an organizational rather than a technical approach;
- a complement to government regulation;
- part of the larger management system of an organization
- formally structured and rigorous; and
- concerned with consistently achieving high standards of environmental performance and improving upon them.

2.5.2 Components and use of EMS

Although weights and terminology differ from one EMS model to another, the generic components in an EMS are (Hunt and Johnson 1995):

- environmental policy;
- planning;
- management review;
- implementation and operation; and
- monitoring and correction.

There is, however, no fixed approach to establish an EMS. The International Institute for Sustainable development (2004) summarizes the key requirements of an EMS and states it must:

- include a senior management commitment;
- include a commitment to continuous improvement;
- address legal and other requirements; and

- reflect interested parties' concerns in the development of objectives and targets.

It should be noted that continuous improvement suggests that perfect environmental protection can never be attained, but organizations should constantly try to move in that direction (Williams and Todd 1997).

2.5.3 Historical development and rationale of EMS

The EMS concept cannot be traced to a single author or organization. It has evolved due to increased recognition of the need to address environmental pressures faced by organisations in an integrated and proactive manner (Hunt and Johnson 1995). EMS has its roots in environmental auditing, but has evolved due to dissatisfaction with environmental auditing as a means of ongoing environmental management (Todd 1994). Environmental auditing has shifted from addressing environmental performance in relation to legislative and regulatory requirements, to evaluating organization's practices, management system, and equipment designed to protect the environment (ICC 1989; 1991). The EMS concept has had a major influence on business thinking and environmental management attitudes, both in the private and the public sector. Williams and Todd (1997) summarized the influences that have helped organisations to recognize the potential benefits and role of EMS frameworks. According to them, the key influences are:

- Health and safety
- Internal control (accounting)
- Due diligence (law)
- Total quality management
- Environmental impact assessment

Companies adopt an EMS for a variety of reasons. According to Williams and Todd (1997) the key benefits for adopting an EMS include:

- reducing the possibility of environmental accidents and thus preventing future fines and liabilities;
- meeting lender requirements for an EMS review as a condition of lending;
- responding to customer demands for third party EMS audits in order to reduce their own liability, particularly in real estate transactions;
- complying with EMS industry-wide codes of conduct requirements;
- participating in voluntary government or business EMS sustainability initiative; and,
- using an EMS to gain competitive advantage over competitors.

This section has summarized what an EMS does and contains. Also, it provides information on key components and requirements of EMS. Although an EMS may eventually be a powerful approach to sustainability (Todd 1994), the EMS literature is mainly focused on environmental aspects of sustainability, rather than social aspects.

2.5.4 Sustainability management systems

An increasing number of sustainability models now incorporate aspects of social well-being, as well as economic and environmental values (British Columbia Round Table on the Environment and the Economy 1993). EMS, however, tend to emphasize environmental over social values (Todd and Williams 1994). Todd and Williams (1994) developed an EMS framework for ski areas. They noted that in order for their ski area EMS to be a sustainability management system (SMS), it must be expanded to explicitly recognize and include the social dimension of sustainability, i.e. social well-being. The

academic literature in this field is much more focused on EMS than on SMS. It does for example not provide a general definition of the SMS concept.

Several non governmental organisations have developed sustainability management frameworks. The Natural Step Framework is a science based framework for organizations, communities, and individuals to take steps toward sustainability (Burns 2000). It is a strategic tool that helps organisations to identify the risks and opportunities associated with sustainability issues. The framework is intended to enhance an EMS by providing the vision that guides a company towards sustainability, and an understanding of what constitutes a sustainable direction. Figure 6 shows a SMS model that was developed by the principles of the Natural Step framework. As the figure illustrates, this model is based on the same fundamental principles as a generic EMS.

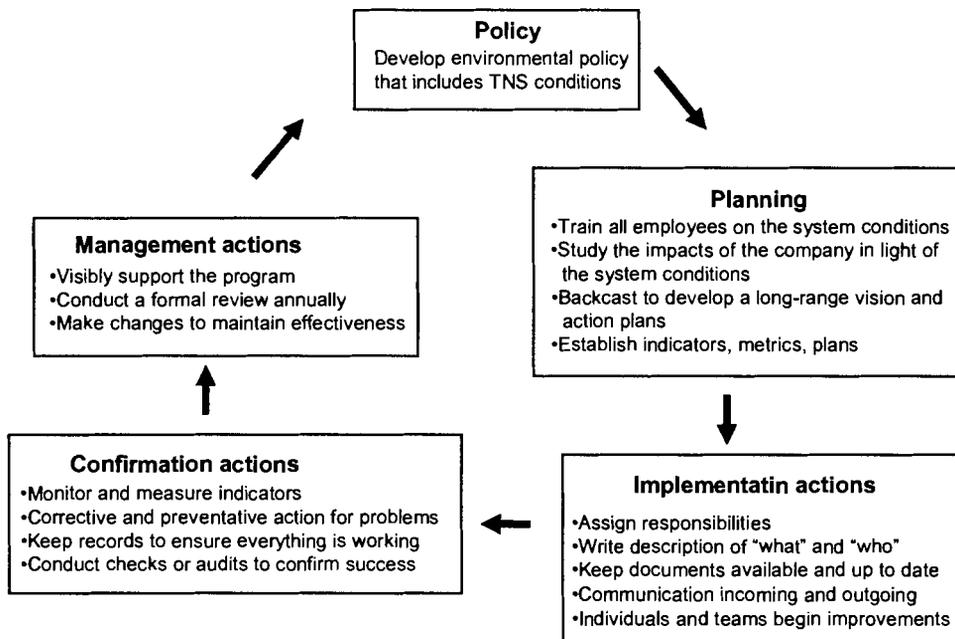


Figure 6. A SMS based on the Natural Step (TNS) framework.
Source: adapted from Burns (2000).

Organizations may have different reasons for adopting a SMS. Wolfe (1992) suggests that such benefits include cost saving from more efficient use of resources, improved corporate image, increased customer loyalty, improved decision making, decreased risk of environmental degradation, and the reduction of potential conflicts. The academic literature suggests that a SMS model, such as the one that is proposed in this research, can be developed from an EMS model by including the social aspect of sustainability.

2.6 Impacts and other management concerns of ski area operation and development

In order to be managed effectively and in a sustainable fashion, ski areas need detailed information about their environmental, socio-cultural, and economic impacts. This chapter summarizes ski area impacts and related management concerns.

The ski industry has experienced a decreased growth in skiing related revenues during the last 10 to 15 years (Harabaugh 1997; Hudson 2000; Williams and Fidgeon 2000). In addition, evidence suggest that an increasing number of ski area visitors do not ski at all (Cockerell 1994). In North America, slower growth in the ski area industry has been followed by a consolidation, which is intended to reduce cost and attract new customers (Harabaugh 1997; Kaplan and Glick 1996). This trend has motivated ski area operators to offer a greater variety of different services and activities, in addition to ski operations (Hudson 2000; Wilmott 1994). These include:

- accommodation;
- food services;
- real estate development;
- transportation system;
- retailing activities;

- winter related recreation activities, such as ice skating, sledging, dog sledding, tubing, snowmobiling and heli-skiing; and
- summer related recreation activities such as golfing, mountain biking and hiking.

The idea is to turn the resorts into winter theme parks and develop year-round facilities which expand the tourist season and attract property buyers (Wilmott 1994; Hudson 2000; Winter Wonderlands 1998). This, and the fact that ski areas tend to attract a great number of visitors to the small area they are operated in, creates environmental, social and economic impacts associated with ski area operations and development.

2.6.1 Environmental impacts and management concerns

Mountains - which are a source of water, energy and biological diversity - are globally experiencing environmental degradation due to intense pressures from human activity, including tourism (Messerli and Ives 1997). Ski areas are operated in mountainous areas, where the impact of humans are often felt much more than in many lower elevations (Hudson 2000; Price et al. 1997). In addition, ski areas have expanded to higher altitudes, in order to expand the resort's capacity and the skiing season (Tuppen 2000). Generally, the most immediate and apparent environmental impacts caused by ski areas occur during their expansion and development (Todd and Williams 1996). However, cumulative effects of growth and the use of the same ski run over time also put pressure on the natural environment (Waldron and Williams 2002; Wilde 1998; Wingle 1991). Waste problems and the consumption of water and energy have also raised questions about the sustainability of ski resorts (The Colorado Department of Public Health and Environment, and Tetra Tech 2002.). Ski areas need a large amount of energy to run lifts, pump snowmaking water, operate buildings, and fuel vehicles. Furthermore, ski areas can also

cause indirect impacts. For example, electricity use requires land be flooded to create hydroelectric dams, mined or drilled for power plant fuel, or used for ash or nuclear waste disposal. Typical ski area environmental management concerns include (SOMI 1981):

- scenic beauty of the ski area;
- water quality;
- solid waste management;
- adequacy of sewage facilities;
- water consumption;
- health of local ecosystems;
- soil and vegetation protection;
- air quality;
- noise levels;
- energy consumptions;
- fuel and chemical handling; and
- protection of wildlife populations.

Wilde (1998) classified impacts associated with construction and operation of ski areas as being related to pollution, physical processes or biological systems. According to him, the larger environmental issues of ski areas are:

- *Waste management* (solid and liquid waste treatment and disposal, special wastes, fuel storage, non-point waste sources, water and air quality).
- *Water management* (water supply and hydrology)
- *Fish and wildlife resources* (fisheries impacts, habitat impacts, wildlife impact of utility and access corridors, human conflicts with wildlife, impacts on vegetation); and,
- *Aesthetics* (visual effects of pollution, buildings, lifts, etc.)

Appendix B shows in more details the potential environmental impacts of ski area development and operation as suggested by Wilde (1998).

2.6.2 Socio-cultural and economical impacts and management concerns

The literature on socio-cultural and economic impacts of ski areas is mainly focused on resort communities, in particular growth issues (Gill 1991, Williams and Gill 1999; Williamson 1991). Little research has, however, been conducted on the nature of community in a resort setting (Gill 1991). Resort communities, which are generally very dependent on tourism, often experience a rapid growth that presents a unique set of issues and problems, such as inequity and a lack of basic community facilities and services (Gill 1991; Williamson 1991). This can motivate residents to move away from the place if the community fails to meet their needs. Resort developers must thus be sensitive to the limits of growths (Gill 1991). Communities also experience problems associated with seasonality of winter resorts (Zimmerman 1991), as well as escalation in prices of goods and services and increased taxation (Federspiel 1991; Gill 1991; Culbertson et al. 1991). Furthermore, influences from tourism on existing cultures can lead to loss of cultural identity (Messerli and Ives 1997). Williamson (1991) has pointed out that many of the problems discussed above can be explained by the different sets of priorities for serving the visitors as compared to serving the residents.

More related to the visitors is their on-site experience (Wingle 1991). On-site experience can for example be affected by conflicts between different groups, such as skiers and snowboarders (Lindberg et al. 2001; Williams et al. 1995). This is, however, not discussed much in the ski area literature. Other key socio-cultural and economic impacts and management concerns associated with ski area operation and development include (Culbertson 1991; Gill 1991;

Holden 1998; Holden 1999; Messerli and Ives 1997; NSAA 2000; NSAA 2003; The Colorado Department of Public Health and Environment, and Tetra Tech 2002; Williams and Hunter 2002; Williamson 1991; Wingle 1991):

- problems associated with migration out of and into the community;
- homogeneity of employment;
- increased traffic;
- increased level of crimes;
- economic leakage from the community;
- lack of affordable housing (for employees);
- sourcing of goods and services; and,
- maintaining a character of place.

The literature on environmental and social impacts of ski areas identifies some of the key issues that need to be taken into account in a SMS for ski areas. It should, however, be emphasised that the social issues focus mainly on issues in a resort community.

2.7 Sustainability management in the ski area industry

This section discusses the rationale for sustainable ski resorts and introduces an EMS model for ski areas. It also looks at sustainability management performance and stakeholders in ski area development and operation.

2.7.1 Rationale for sustainable ski area management

Ski area operators and the communities which surround them are facing increased pressure from environmental agencies, non governmental organisations (NGOs), ski area employees, and local and national ski area associations to improve their environmental performance (The Colorado Department of Public Health and Environment, and Tetra

Tech 2002). This pressure has increased because the public is becoming more familiar with the possibilities of environmental risk and less tolerant of environmental degradation. Furthermore, the public is increasingly empowered by public consultation processes to demand enforcement of environmental regulations (Beeler and Wood 1990). Governments in North America and Europe mandate some form of environmental impact assessment and other forms of legislation to address environmental impacts of ski areas (Todd and Williams 1996; Wilde 1998). Furthermore, governments also provide guidelines for ski area development (Ministry of Environment, Lands and Parks, BC 1996; The Colorado Department of Public Health and Environment, and Tetra Tech 2002). Environmental legislation, which has become stricter and more complicated in recent years, increasingly assigns liability directly to polluters and requires destination operators to address environmental impacts (Sherman et al. 1991). This legislation normally provides a legal framework only for the pre-development assessment of ski area impacts. Typically it does not address the post-development monitoring of ongoing ski area operations (Todd and Williams, 1996).

Tourism managers have been willing to incorporate environmental measures to management strategies, if they have resulted in lower costs for the tourist industry (Mihalic, 2000). At the same time the presence of high environmental quality in ski destinations is a predominant issue in making travel decisions, and thus can represent a competitive advantage for some tourism destinations (Flagestad and Hope 2001; Mihalic 2000; WTO 1993).

Goeldner (1996) notes that the need for a systematic approach to managing ski areas in a sustainable fashion is driven by the increased awareness of the environmental effects of the industry, and the growing conflict between mountain developers and its

environmental stakeholders. Ski area operators are increasingly recognising that “the environment is a ski area’s number one asset” (NSAA 2000, 1). A study by Todd (1994) on environmental management in North American ski areas showed that the need for a systematic sustainability management to managing the ski area industry was primarily driven by:

- a growing appreciation of the ski industry’s environmental effects on mountain environments;
- increasing conflicts between ski area developers and environmental stakeholder groups on issues related to growth in mountain regions; and,
- expanding appreciation of the part of ski area operator of the benefits to be gained from applying sound environmental management practices in their operations.

Subsequently, Todd and Williams (1996) proposed an EMS framework for ski areas. They suggested that such frameworks could benefit the ski area industry by reducing the risk of penalties and financial liability for environmental damage; improving public and customer relations; reducing operating costs; and improving access to lenders, insurers, and investors. They felt that a self-regulatory approach to ski area environmental management, that includes consensus-based and standardised codes of conduct and practice, could also offer an efficient way of protecting environmental resources and an opportunity to reduce some of the growing pressures for government-based regulation. Todd’s and William’s ski area EMS is further discussed in next section.

2.7.2 Environmental management system for ski areas

Todd and Williams (1996) describe the evolution of sustainable tourism from concept to practice as being comprised of four stages:

1. Development of principles.
2. The translation of principles into practice.
3. Creation and implementation of environmental auditing or monitoring programmes.
4. Environmental management systems (EMS).

The last stage, EMS, provides a management framework for guiding all of these activities towards sustainability objectives. Todd and Williams proposed a “self improvement” EMS model for the North American ski area industry. The model is based on the EMS literature and has six elements and several related components, chosen to be suitable for use in ski area operation. As suggested for generic EMS models, it represents processes with flows, feedback, and continuous improvement cycles. Table 3 summarizes the model and elaborates on the elements and their components (Todd, 1994; Todd and Williams 1996; Williams and Todd 1997).

Table 3. Elements and components of the ski area EMS model.

<i>EMS elements</i>	<i>Components</i>
Policy	Purpose Commitment Policy statement
Planning	Analysis Objectives and targets Implementation plan
Procedures and controls	Organization Performance measurement Information management Incident response
Training and education	Staff training and education Strategic research Guest education
Communication	Internal communication External communication
Assessment and Improvement	System reviews Environmental audits Follow-up Implementation

Source: adapted from Todd (1994) and Todd and Williams (1996).

Todd (1994) tested the applicability of this EMS model in an operating ski area development. The case study provided ways in which an EMS elements and components might be used to systematically guide the solid waste and vegetation management. It demonstrated that the EMS could well be applied by an existing ski area operator. It was, however, acknowledged that the EMS does not address many of the broader social, cultural, and community aspects of sustainability for a ski area (Todd 1994). These are very important issues for ski areas, where past controversy has centred on the social and cultural effects of ski resort growth.

Finally, the study found some obstacles to formal acceptance of the model in the ski area industry. In particular, organizational resistance to change and financial constraints were identified as key barrier to the implementation of EMS frameworks. However, it was noted that EMS need not be overly sophisticated, due to its continuous improvement philosophy which permits a fairly simple system to be gradually amended over time (Todd 1994).

2.7.3 Sustainability practices of ski areas

A number of projects and initiatives in the tourism industry, aiming at pushing the industry in a sustainable direction, currently exist (Harris et al. 2002; Williams and Budke 1999). Destination operators and managers are increasingly using systematic frameworks in order to manage negative impacts and maximise potential benefits associated with the destinations. This includes tourism associations (NSAA 2000; BC Heli and Snowcat Skiing Operators Association 2003) as well as destinations that have developed their own

sustainability management framework (NSAA 2003; The Colorado Department of Public Health and Environment, and Tetra Tech 2002; Waldron and Williams 2002).

2.7.3.1 North America

Todd and Williams (1996) analysed environmental management practices of North American ski areas. Their research shows that many ski areas are involved in a wide variety of initiatives to protect and enhance environmental resources. The study suggests that the ski area industry is active in practices of sustainable tourism, but it has to some degree neglected clearly identifying guiding principles for its programs. The ski area industry is thus facing two cornerstone tasks if it is going towards sustainability (Todd and Williams 1996):

1. Development of a consensus based set of sustainability principles for ski area developments.
2. Creation of commonly accepted environmental management framework to ensure that principles are implemented.

In 2000, the National Ski Areas Association (NSAA), which is the trade association for ski area owners and operators in the USA, released a document called *The Sustainable Slopes – The Environmental Charter for Ski Areas* (NSAA 2000). The fundamental goal of the initiative is to improve the environmental performance of the ski industry (NSAA 2003), or as stated in their vision statement: “to be leaders among outdoor recreation providers through managing our business in a way that demonstrates our commitment to environmental protection and stewardship while meeting the expectations of the public” (NSAA 2000, 3). The initiative provides a framework for ski resorts to voluntarily implement best practices, assess environmental performance, and set goals for

improvement in the future. It offers a set of 21 environmental principles, as well as suggestions how to implement them. The principles were developed through a stakeholder process where input was sought from a wide variety of interests, including federal, state and local government agencies, environmental and conservation groups, other outdoor recreation groups, and academia. Overall, 173 ski resorts, both in the USA and Canada, have now endorsed the Environmental Charter and committed to implement the principles (NSAA 2003). The principles address the following aspects:

- planning, design and construction;
- water use for snowmaking
- water use in facilities
- water use for landscaping and summer activities;
- water quality management;
- energy use for facilities;
- energy for snowmaking;
- energy for lifts;
- energy use for vehicle fleet;
- waste reduction;
- product reuse;
- recycling;
- potentially hazardous wastes;
- waste management;
- fish and wildlife management;
- forest and vegetative management;
- wetlands & riparian areas;
- air quality;
- visual quality;
- transportation; and,
- education and outreach.

The Charter, which is mainly focused on environmental concerns, encourages ski areas to adopt the “avoid, minimize, mitigate” approach to natural resource management (NSAA 2000). In addition, some social, cultural and community issues are addressed. In particular the charter suggests engagement and partnering with stakeholders, such as local

communities, environmental groups, and government agencies. However, many of the typical social issues discussed in the literature (see section 2.6.2) are not addressed.

The process in the Sustainable Slopes initiative is intended to be dynamic rather than static. An annual report discusses implementation status of the principles, resort progress, improvements, and goals for the future (NSAA 2003). Table 4 summarizes the overall most and least implemented principles for the year 2002. The least implemented principles included areas of energy use. Annual reports also show that the number one benefit from implementing the principles is reduced environmental impacts (NSAA 2003). Public image is also perceived to be an important factor for implementing many of the Charter's principles.

Table 4. Sustainable Slopes, implemented principles in 2002.

Overall most implemented principles	Overall least implemented principles
<ul style="list-style-type: none"> • Wetlands and riparian areas • Visual quality • Planning design and construction • Potentially hazardous waste 	<ul style="list-style-type: none"> • Energy use for lifts • Product reuse • Energy use for vehicle fleets • Energy use for snowmaking

Source: adapted from NSAA (2003).

The Sustainable Slopes initiative has been criticised by environmental groups for not addressing ski resort expansion or impacts on wildlife habitat, wetlands, aquatic resources, roadless areas and old-growth forests (CNN 2000; Jesitus 2000). They also point out that the charter does not include any enforceable provisions or mechanisms for third-party monitoring. Furthermore, measurement of the environmental performance is based largely based on qualitative indicators. This, however, is recognised by the NSAA, and quantitative indicators are now being developed (NSAA 2003). Such monitoring principles and practices are being implemented in resort destinations such as Whistler

(Waldron and Williams 2002). Moreover, the operators of Whistler-Blackcomb have adopted their own EMS framework.

Local authorities are also taking initiatives towards more sustainability in ski area operations. Local authorities in Colorado initiated discussions with ski area representatives and other stakeholders about proactive strategies for improving regulatory compliance, reducing wastes, and conserving natural resources. The ultimate outcome from these discussions was a handbook that provides detailed environmental improvement strategies for on-mountain operations (The Colorado Department of Public Health and Environment, and Tetra Tech 2002). The handbook takes a practical step toward fulfilling the environmental principles made by the NSAA. However, it does not address many of the social, cultural and community issues associated with ski area operation and development. Themes discussed in the handbook include:

- environmental programs and policies;
- environmental performance measurements and reporting;
- regulatory compliance;
- customer, employee and community programs;
- purchasing guidelines;
- vehicle and equipment maintenance;
- lift operations;
- food and beverage service;
- building maintenance;
- snowmaking;
- lodging;
- grounds maintenance; and,
- sustainable design and construction.

Ski area operators in North America are also concerned about the safety of their guests. The NSAA, along with some of their stakeholders, has created a safety initiative (NSAA 1999). The initiative is intended to assist ski area operators to address the topic of slope safety for guests. The primary goal is to reduce the frequency of accidents by communicating a proactive and strong, but positive, safety message to guests and other stakeholders.

2.7.3.2 Europe

A significant regional variation exists in the structure of the tourism industry and its economic importance in Europe. In the Alps, ski areas are often managed by several companies, because ownership is split between many small farmers (Hudson 2000). Hudson (2000) points out that ski resort operation in Europe has been characterised by attempts to improve quality of the destinations, rather than expand them. Environmental groups in Switzerland, however, have recently criticised ski area expansion in the country, stating that such projects are currently not economically viable (Swissinfo 2003). As in the USA, a conflict between environmental groups and ski area developers characterize the European ski area industry (Hudson 2000).

May (1995) discusses the relationship between tourism and land use in the Alps. He states that the links between land use, forestry, landscape, and tourism can only be maintained if the peasant farmers, who manage the landscape, are encouraged to remain in the mountains. In Switzerland and Austria, mountain-based agriculture and tourism have coexisted in a symbiotic relationship, supported by local political control (Hudson, 2000). However, due to the potentially significant economic contributions of skiing, ski

area operators are unwilling to take responsibility for the environment and some do not acknowledge the environmental impacts from skiing.

Governments, NGOs and private business, have initiated a number of projects in order to move tourism in the Alps in a sustainable direction (Hudson 2000; Bakker et al. 2001). In contrast to North America, the ski area operators generally do not initiate these projects themselves. The VP Bank in Liechtenstein, supported by a NGO, has for example initiated a project that aims at developing an audit for ski areas (Pro Natura 2000). The guidelines for the audit are summarized in Table 5.

Table 5. Components of an environmental audit for ski areas.

Process components	Description of process components
Environmental policy	Includes formulating fundamental environmental guidelines that are integrated into business policy.
Environmental assessment	A cornerstone of the environmental audit system. Includes compilation of business data relevant to the environment, analysis and evaluation of weaknesses, and assessment to what extent environmental legal provision are complied with.
Environmental goals / environmental program	Taking into account the means and possibilities of the business, goals and measures for eliminating weaknesses are formulated and a time schedule is established.
Environmental management system / environmental information system	Includes determining a structure for implementing the business' environmental protection.
Environmental declaration	Represents the interface with the public and insures communication with interest groups.

Source: adapted from Pro Natura (2000).

2.7.4 Stakeholders in ski area management

Flagestad (2001) studied the relationship between strategic success and organisational structure in winter sport destinations by using a multiple stakeholder approach. In order to measure stakeholder satisfaction, Flagestad identified and prioritised stakeholders in a winter sport destination. Stakeholders were identified based on the literature on stakeholders of firms (Wood 1994) and stakeholders identified in destination models and

definitions of tourism (Flagestad and Hope 2001). Stakeholders were organised into groups according to the type of resource provided, where each group represents distinct and different resources to the destination. Table 6 lists these stakeholders.

Table 6. Stakeholders of a winter sport destination.

<i>Stakeholder groups</i>	<i>Stakeholders</i>
Community based stakeholders	<ul style="list-style-type: none"> • Local government • Permanent residents • Environment • Culture/heritage
Service provider/business unit stakeholders	<ul style="list-style-type: none"> • Destination ski management company and Independent service providers (private and public) providing: <ul style="list-style-type: none"> ○ Accommodation ○ Food service ○ Shops ○ Ski lifts ○ Ski Schools ○ Ski rentals ○ Entertainment ○ Medical service ○ Police ○ Mountain (ski) security ○ Post and Telecom ○ Local transport ○ Information office
Employees (incl. executives)	<ul style="list-style-type: none"> • Permanent employees • Seasonal employees
Market based stakeholders	<ul style="list-style-type: none"> • Customers/visitors • Tour operators
Owner based stakeholders	<ul style="list-style-type: none"> • Owners of land • Shareholders – local • Shareholders – external
Financial stakeholders	<ul style="list-style-type: none"> • Banks • Other debt owners
Other stakeholders	<ul style="list-style-type: none"> • Media • Unions • Environmental groups • Suppliers • Sport clubs, Marketing alliances, Voluntary organisations

Source: adopted from Flagestad (2001).

These stakeholders were prioritised based on attributes such as their power to influence the firm, legitimacy in relationship with the firm, and urgency of claim on the firm, as well as destination management perception of relationship between stakeholders (Flagestad 2001). The study indicated that the most important stakeholders for a strategic success and organizational structure in a winter sport destination were (Flagestad 2001):

- land owners;
- local government;
- customers;
- tour operators; and
- big event organisers.

Flagestad (2001) points out two roles of destinations:

1. As a resort and product in a competitive market place, and
2. As a community safeguarding the prosperity of the residents.

Flagestad's (2001) research illustrated that stakeholder involvement in destination management is an issue both in Europe and North America. Stakeholder focus is predominant in terms of rationale for destination development, in particular the role of resident's prosperity. The study suggests that management in winter sports destinations need to take into account those stakeholders when taking decisions, whether at strategic or operational level.

Wingle (1991) looked at the interrelationship between US ski destinations and resort communities, and how ski area operators can work together with their stakeholders in order to create a winning solution for involved parties. He suggests a close interrelationship between the ski area and the resort community should exist in management areas associated with:

- the physical connection between the private lands and the facilities on the National Forests;
- the environment;
- the character of the place;
- issues of community; and,
- the attractiveness of the developed mountain.

Hudson (1995; 2000) provides a model for the greening of winter sports resorts, where different stakeholders play a key role. The model includes managers of a destination, operators, conservation groups, tourists, development and management, marketing and legislation. Hudson suggests that the relationship between those components can contribute towards effective greening of a destination. This relationship is summarized below and the model is shown in Figure 7 (Hudson 1995; Hudson 2000).

1. *Responsible tourists – responsible operators*: Tourists demand greener products, provided by operators. Operators persuade skiers to travel with them for environmental reasons.
2. *Responsible operators-responsible marketing*: Operators use sustainability as a marketing tool and seek to cooperate with resort marketers to communicate with consumers.
3. *Responsible marketing-responsible development and management*: marketers are expected to keep management informed as regards to consumer tastes, attitudes, desires, etc. Management and developers look to the marketers to inform the public of environmental efforts and use sustainability as a marketing tool.
4. *Responsible development – responsible legislation*: Management and developers comply with local, national and international laws and, in turn, may lobby for rights to conduct their business in a responsible manner.
5. *Legislation – conservation groups*: Conservation groups use the existence of legislation as ammunition when exerting pressure on resorts. They also lobby for new environmental legislation to curb irresponsible development.

6. *Conservation groups – responsible tourists*: Conservation groups influence tourists through media and the tourists, in turn, join or form such pressure groups.

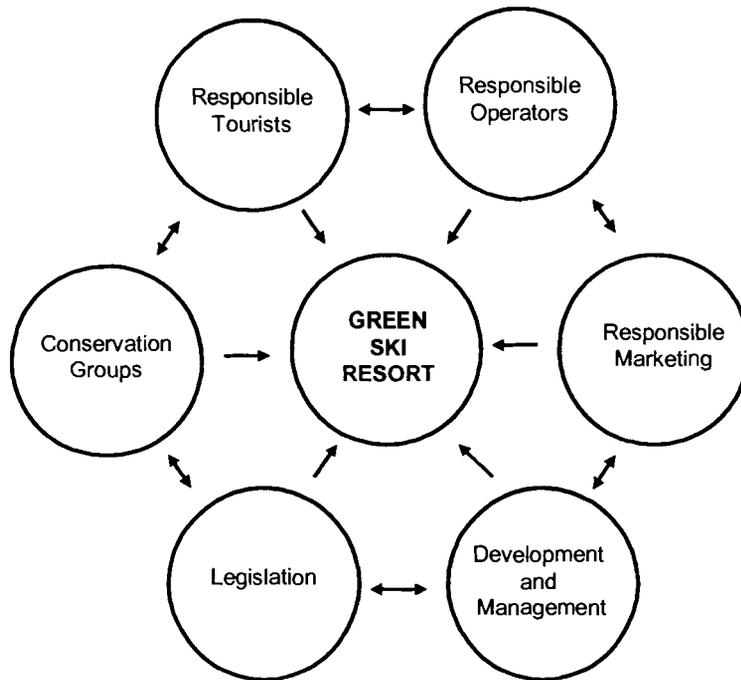


Figure 7. A model for the greening of ski resorts.
Source: adapted from Hudson (1995).

2.7.4.1 Stakeholders' roles

This section explores the role of residents, local governments, environmental groups, and ski area visitors in a sustainable managed ski resort.

Residents and local government

The literature highlights the importance of the relationship between ski area operators and the community, i.e. residents and local government. Flagestad and Hope (2001) state that ski corporations in a particular destination have strong political power in community destination development. Other studies show that communities also have power over ski area operators. Gill's (1991) study in Whistler, Canada, shows the importance of community participation and collaboration in the sustainable development of a

destination. In particular, public discussion, understanding and involvement with issues of community importance are believed to be essential components of a healthy community growth and sound management (Gill 1991; Federspiel 1991). Furthermore, Gill (1991) points out the importance of maintaining environmental quality if the resort is going to have the residents' support for tourism development and attracting tourists. In Whistler, the community and the ski resort operators have collaborated on sustainability initiatives. The ski area operators have for example now joined other members of the community in the "Whistler. It's our Nature" sustainability initiative, which is based on The Natural Step Framework (NSAA 2002). Partnership between a community based NGO and the operators of Whistler can offer both parties useful tools for discussing and promoting sustainable development in Whistler (Xu 2004). The role of NGOs is discussed in more details in next section.

In contrast to Gill's study in Whistler, Holden's (1998; 1999) research in the Cairngorm area in Scotland has shown that environmental stewardship of a local community, which is very dependant upon a ski area operation, cannot be taken for granted. Holden (1998) argues that the ability to develop a skiing industry that is both market competitive and environmentally sustainable will be difficult. Skiing will be placed in continued confrontation with conservationists and other mountain users. Holden raises the question whether downhill skiing can be a part of a sustainability policy for a mountain area.

Environmental groups

Membership in environmental organizations is growing in North America as well as in Europe. At the same time, a large part of the general public is sympathetic to

environmental initiatives (Lane 1992). A variety of interest groups, both local and non local, is finding common causes related to fighting to preserve “quality of life” in communities (Beaudry 1991). As previously noted, a conflict between environmental groups and ski resort developers exists around the world (Hudson 2000). The focus of the environmental groups has been on impeding expansion of ski areas and its effects on wilderness areas and wildlife (Hudson 2000; Isaacson 2000; Swissinfo 2003). In some cases they have succeeded in stopping ski area expansion and construction of buildings. As a result, operators are finding it more and more difficult to expand ski resorts. Ski resorts are, however, increasingly working with environmental groups in order to get their approval and support (NSAA 2000). In Whistler, a relationship between a community based environmental NGO and the operators of the ski area has been moving from antagonism to collaboration over the years (Xu 2004). A study by Xu (2004) demonstrated that improving credibility and heading off negative public confrontations are key driving factors for the ski area operators to collaborate with the environmental NGO. The main drivers of partnership from environmental NGO perspective included need for more resources (funding and expertise) and greater leverage in making things happen.

Environmental groups also evaluate environmental performance of ski resorts. One such example is the Ski Area Environmental Scorecard, which grades ski resorts on their environmental performance, “enabling skiers to patronize resorts with genuine positive environmental stewardship records” (Ski Area Citizens’ Coalition 2002).

Environmental groups have pointed out that ski area expansion makes no sense when ski areas are facing stagnating markets (Swissinfo 2003; Hansen 2000). Some resort managers have on the other hand pointed out that the environmental groups are rejecting

this form of economic growth, despite the fact that other alternatives are more damaging to the environment, such as logging and mining. Fry (1995) has pointed out that the lack of environmental knowledge among groups, which leads to misunderstanding, might be an obstacle to reaching agreement between the groups and resort operators.

Ski area visitors

The environment is becoming an important factor in shaping visitor attitude towards destinations (Mihalic 2000; NSAA 2003; WTO 1993). There is convincing evidence that visitors turn away from what they consider polluted destinations (Mihalic 2000) and skiers are asking the companies they travel with more questions about environmental policies (Hudson 2000). In North America, the growth in nature-oriented tourism reflects increased environmental concern by visitors (Hudson 2000). Evidences also suggest that travellers in North America are willing to spend more money for travel service and products provided by environmentally responsible suppliers (TIAA 1992). In Europe, the majority of all frequent German skiers believe the sport is damaging to the environment (Cockerell 1994). Some studies show that skiers are more concerned about the environment than other sportsmen (Rockland 1994), while other studies show that skiers overall do not have strong views about the environment, and certain groups of skiers, especially young skiers, favour expansion of ski areas (Fry 1995; Holden 1998).

This section has highlighted the important role different ski area stakeholders play in supporting and implementing a SMS for ski areas. It leads to the conclusion that a SMS cannot be successfully implemented without stakeholder collaboration.

2.8 Literature summary

As a business goal, sustainability has been driven by the recognition of the linkages between the economy and environment. At the same time, firms are increasingly experiencing pressures from government, customers, employees, and competitors to address their broader impacts. On their route to sustainability, firms have increasingly taken into account their stakeholder interests, both for ethical reasons, as well as for the achievement of strategic or economic objectives. Collaborative relations with stakeholders - which focus on problem-solving, where parties solve problems based on some mutual interests - are now believed to be vital if business want to operate in a sustainable way.

Ski areas put pressure on the natural environment during their expansion and development, but also by cumulative effects of growth and the use of the same ski run over time. Legislations generally do not address the post-development monitoring of ongoing ski area operations. The literature provides a good base for developing a SMS framework for ski areas; in particular a ski area EMS, as well as a framework developed by the National Ski Area Association to implement environmental best practices. These frameworks are, however, mainly limited to environmental concerns. In order to be a SMS, the frameworks need to be expanded to include the socio-cultural and economic dimension of sustainability. The literature on social issues and ski areas is mainly focused on resort communities. The literature on outdoor recreation and protected areas (protected for landscape and recreation) as well as principles of sustainable tourism development appears to be a good base to expand the broader issues of social sustainability of ski areas. It emphasises and discusses the importance of community involvement and how it can improve quality of life in local communities. Models for the greening of winter sports

include stakeholders as a key component. The literature suggests that management in winter sports destinations need to take stakeholders into account when taking decisions on strategic and operational level. A ski area SMS cannot be successfully implemented without collaborative relation with the ski area stakeholders.

CHAPTER 3: RESEARCH METHODS

3.1 Overview

Two qualitative methods were used in this study, a literature review and a case study of Bláfjöll ski area, located in the south western part of Iceland. The literature review in chapter two provided a foundation for the development of a prototypical sustainability management system (SMS) framework that was ground-truthed in the case study. In-depth personal interviews with the operators and stakeholders of Bláfjöll, as well as other available information on the ski area, were then used to develop the final SMS framework. This chapter describes the research methods used in the study, the literature review and the case study. It includes a rationale for the case study as well as the informant selection process and structure of the interviews. Limitations and strengths of the study design are discussed at the end of the chapter.

3.2 Research goals and questions

3.2.1 Research goals

The research project has two main goals. The first goal is to identify key components of a SMS for ski areas. It is achieved through a literature review which reveals and summarises sustainability practices, issues, and problems associated with ski areas in North America and Europe. The second goal is to develop a workable SMS for Bláfjöll. It is reached through information collected from existing literature, and interviews with key stakeholders from the case study region.

3.2.2 Research questions

The research questions of this study are:

- What are the key components of a SMS for ski areas?
- What are the key components of a SMS for Bláfjöll?
- What strategies must be taken in order to implement a SMS in Bláfjöll?

3.3 Literature review

The key environmental, social and economic impacts and other management concerns that need to be taken into account in a ski area SMS were identified in the literature. The ski area literature provided information on environmental issues, but discussions concerning social issues were limited to issues in resort communities. The literature on outdoor recreation and protected areas was especially valuable in identifying social issues that were not discussed in the context of ski areas or destinations. These issues included encouraging stakeholder involvement and related capitalizing on community benefits. The SMS model that is proposed here is mainly based on existing ski area environmental frameworks (Todd and Williams 1996; NSAA 2000) and literature discussing social management concerns in tourist destinations (e.g. Anderson et al. 2000; Eber 1992; IUCN 2002; WTO 1993).

The importance of stakeholders in the sustainable management of destinations is highlighted in the literature. Stakeholder engagement and collaborative relations have become important aspect of many corporate business strategies, and they are now believed to be vital if businesses want to operate in a sustainable way (Robbins 2003). The “stakeholder approach” has been driven by the fundamental assumption that there exists a relationship between the firm and the stakeholder that is based on some mutual

interest (Freeman 1984). Stakeholder consultation and community involvement are important elements in managing tourism and outdoor recreation in a sustainable way (Eber 1992; IUCN 2002). Collaborative relationships between destination managers and stakeholders are now believed to be a key to destination success (WTO 1993). Consequently, the relationship between the ski area operators and its stakeholders is one of the key components in this study's proposed SMS.

3.4 Case study

3.4.1 Case study rationale

According to Yin (1989, 13), a case study is an “empirical inquiry that investigates a contemporary phenomenon within its real life context”. A case study is an appropriate investigative technique when the research involves “how” and/or “why” questions, and when the unit of study is complex and cannot, or should not, be separated from its context.

Based on the findings emanating from the literature review, a case study was undertaken to develop a SMS for an existing ski area. Bláfjöll ski area, located in the south western part of Iceland (Figure 8), was selected for the case study. It is a small ski area with 12 ski lifts providing a carrying capacity of about 8000 persons per hour. The ski area is located within Bláfjöll Country Park, which is a protected area mainly for recreational use (Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003). The Country Park is included in the case study as well, because the park and the ski area are managed by the same parties. In addition, one of the fundamental principles for managing protected areas today is integration, as opposed to isolation (Beresford and Philips 2000; IUCN

provide a framework applicable for smaller ski areas in other regions. Secondly, the case provides an opportunity to study how stakeholders can inform the sustainable management of ski areas. A variety of stakeholders from the 12 municipalities that operate the ski area - including government agencies, NGOs and the general public - have different interests in the ski area operation and development. Furthermore, the ski area is located in a protected area and a Water Conservation Area. Stakeholders play an increasingly important role in managing such areas sustainably.

Finally it should be noted that although the ski area is owned and operated by local governments, the operators have a degree of freedom in determining its management focus and performance. As a result, the proposed SMS model is an example of a voluntary environmental management approach, applied by a public company.

3.4.2 Qualitative interviews

Individual interviews are a qualitative research technique that involves talking in-depth with a few individuals, and searching for meaning, ideas, and relevant issues addressed in the conversation (Peterson 1994). This technique is often used in qualitative research when the research goal includes understanding a process or an event in which individuals must provide detailed information about how they went about doing something.

Investigators ask key respondents for the facts of a matter as well as their opinions about events, or insights into certain occurrences (Yin 1994). The goal of case study interviews in this research was to identify key sustainability issues for Bláfjöll and explore how those concerns could be effectively incorporated into a SMS for the ski area. The interviews also aimed at identifying how key stakeholders could support a SMS for the benefit of both the ski area and local communities.

3.4.2.1 Interview selection

Participants in qualitative research that includes interviews need to be carefully selected. They have to be relevant to the research problem and contribute to the overall goal of the study (Peterson 1994). Those who contribute only marginally to the study objectives should be excluded. Two groups were interviewed: the ski area operators - including representatives from community shareholders, ski area managers and personnel – as well as other stakeholders, such as: NGOs and government organizations responsible for the supervision of environmental and health matters in the area. The initial selection of the interviewed stakeholders was based on dialogue and available studies and documents that discussed the ski area (ITR 2001; ITR 2002; Línuhönnun 2000; Orion 2003). Broader ski area literature was also useful for identifying the ski area stakeholders (Flagestad 2001). In total, 14 interviews were conducted (7 with the operators and 7 with other stakeholders). These individuals and the stakeholder they represent are listed in appendix C.

3.4.2.2 interview structure and process

The interviews conducted in this study were semi-structured. In such interviews the interviewer has a freedom to manipulate the structure and conditions of the questioning and the respondents are free to formulate responses the way they find most fitting (Sarantakos 1998). The interviews were focused in the sense that they centred on specific topics which the respondents were asked to discuss and provide their opinions. This allowed the discussion to go beyond the originally planned themes and topics, and encouraged the respondents to discuss as many issues related to the themes as possible (Sarantakos 1998). The questions were open-ended and discussion was meant to be free

and open, with the interviewer guiding rather than leading and restricting the respondents. Sometimes questions offered a list of possible answers in order to make responses to certain questions easier and more accurate. When the respondents gave an incomplete, inadequate or general answer, questions were asked to help gain more information about an issue addressed in a primary question. This provided a means of exemplifying and extending statements, as well as stimulating, guiding and assisting the respondent to answer the questions (Sarantakos 1998).

In order to maximise the contribution of the interviews for the research, respondents were provided with background information prior to the interviews. This included several definitions, research objectives and interview themes. The themes and the guiding interview questions were based on discussions with the ski area operators, documents on the study area (ITR 2001; ITR 2002; Línuhönnun 2000), and the literature (discussed in chapter 2). The interview themes addressed included:

- daily operation of the area;
- planning of the area;
- goals of the area;
- identification of resources in the area;
- social management concerns, including community benefits;
- negative environmental impacts of the ski area;
- identification of stakeholders;
- collaborative relationship with stakeholders; and,
- constraints and opportunities in sustainable management of the ski area.

Overall 15-25 guiding questions guided each interview (appendix D). The interviews, lasting 30-120 minutes, were audio recorded. All interviews were conducted in Icelandic. The guiding interview questions, translated in English, were approved by the Ethics

Review Committee at Simon Fraser University (appendix A). The interviews were carried out in a field trip to Iceland in April and May, 2003.

3.4.3 Other data

During interview analysis, new issues came up and new questions were raised. As a result, other information was sought from four additional individuals via a self administered survey questionnaire (appendix C) (Sarantakos 1998). Although this method has its limitations and does not replace the interview method, it provided useful information. Previously interviewed parties were also contacted by telephone and email during the interview analysis to provide additional information and clarifications on specific issues.

In addition to the interviews, other information on Bláfjöll was compiled and used in the research. This included: reports discussing environmental impacts of the ski area (ITR 2001; Línuhönnun 2000; Orion 2003; Skipulagsstofnun 2003), records of meetings and unpublished documents from the ski area operators, laws and regulations that apply to the ski area (e.g. Samþykkt nr. 636 1997) as well as information on the area's physical and biological environment (e.g. Einarsson 1985; Jónsson 1985; Orion 2003; Torfason 2003).

3.5 Data analysis

Key components of a SMS for ski areas were identified from the literature. The SMS model for Bláfjöll was created based on the case study information (i.e. the interviews and other data discussing sustainability issues of the ski area), as well as the literature. The interviews were analyzed according to predetermined themes (see section 3.4.2.2).

Statements and propositions derived from the interviews were compared to the key attributes of ski area sustainability management identified in the literature. Key management recommendations for Bláfjöll, presented in chapter 5, are based on case study findings and the literature review.

3.6 Research design strengths and limitations

In the study, interviewees were from a small sample, selected in a purposive rather than probability-sampling manner. Therefore, the findings provided should be regarded as informed hypotheses, instead of proven facts (Peterson 1994).

In-depth semi-structured interviews do not always provide reliable data, leading to problems with validity (Babbie 1999; Yin 1994). Firstly, interviews, as other qualitative findings, are limited by the skill, experience and understanding of the individual gathering the information (Peterson 1994). They are thus subject to some biases, such as poor recall, and potentially inaccurate articulation. It was thus important to corroborate interview data with information from other sources and consider them as verbal reports only (Yin 1994). Secondly, interviewer asking the questions and probing responses may have influenced responses and perhaps biased the results (Peterson 1994; Sarantakos 1998). Thirdly, interviews offer less anonymity than other methods since the interviewer knows the identity, residence, type of housing, family conditions and the personal details of the respondent. Many people, for example, prefer to write about sensitive issues than to talk about them. As a result, interviews are often considered less effective than other methods when sensitive issues are discussed (Sarantakos 1998). Finally, a bias might be associated with translation of the interviews from Icelandic to English.

Case study research has been criticized for providing very little basis for scientific generalization (Yin 1994). Consequently it might be useful to apply the proposed SMS model in other ski areas to assess its utility. However, in such applications it is important to note that ski areas have different physical and socio-cultural setting and might thus need to undertake different management strategies in order to implement a SMS successfully. Still, the findings from this research provide valuable information about the key components of a SMS for ski areas.

CHAPTER 4: CASE STUDY FINDINGS

4.1 Introduction

This chapter presents the case study findings. The findings are based on interviews with the operators of Bláfjöll and its stakeholders, as well as on other documented information about the study area. The chapter highlights key sustainability issues and management concerns for Bláfjöll, as well as improvement suggestions. In complement with the literature, these findings form a base for the development and implementation of a sustainability management system for Bláfjöll (see chapter five). The findings are presented in five key themes associated with the study area:

- Bláfjöll's vision and objectives;
- impacts and other sustainability management concerns;
- sustainability management practices;
- stakeholder relationship; and,
- improvements.

4.2 Background

4.2.1 Bláfjöll - overview

Bláfjöll ski area is located in the south western part of Iceland, 25 km east of Reykjavík the capital city of Iceland (see Figure 8 in chapter three). Bláfjöll, which mainly serves nearby municipalities, is the biggest ski area in Iceland, with 12 ski lifts (2 chairlifts and 10 tow lifts), about 12 km of cross country trails, and a carrying capacity of about 8,000 persons per hour. Two main lodges provide basic services for ski area visitors. In

addition, four other lodges are operated by ski clubs in the area. Supplementing these are other small work buildings needed for the operation of the ski lifts. The ski area is located within Bláfjöll Country Park. This is protected area for outdoor leisure and public use (Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003; Lög um náttúruvernd 1999). The ski area and the Country Park are both owned and operated by local municipalities. In addition, the Country Park is located on the Greater Reykjavík Water Conservation Area, which supplies the majority of individuals and businesses in the area with fresh water (Reykjavík Energy 2004).

The ski area is located in the Bláfjöll Mountains which are within the active volcanic zone in Iceland, at the east edge of the Brennisteinsfjöll fissure zone. The fissure zone has erupted several times since the settlement of Iceland more than 1,100 years ago (Torfason 2003). The Bláfjöll Mountains lie about 500-700 m above sea level and are approximately 7 km long and 2 km wide. The environment is characterized by geological formations, such as volcanic craters, lava domes, tuff ridges and lava caves that have formed in volcanic activities in the area (Einarsson 1985; Jónsson 1985; Torfason 2003). Some of these phenomenon, such as Eldborg which is a natural monument (UST 2004), are protected by the Natural Conservation Act (Lög um náttúruvernd 1999). The mountains were formed in sub-glacial eruptions, and are thus mainly made of volcanic tuff and pillow lava (Einarsson 1985; Torfason 2003). The area's flatland is covered by recent basalt lava. The bedrock is very porous and despite a high volume of precipitation in the area, most of the surface water drains into the bedrock. The mountains are poorly vegetated and moss covers only part of the lava on the flatland (Torfason 2003).

4.2.2 History and development of Bláfjöll

The history of skiing in Bláfjöll Mountains reaches back to 1936, when the first ski hut in the area was built by members of a sports club from Reykjavík (Einarsson 1985). The hut was located in Jósefsdalur, about 6 km north east of the existing ski area. During the next 16 years, three other huts were built in this area by skiing enthusiasts. In 1967 the municipality of Reykjavík became involved in ski area development in this area, when it decided to build ski facilities in the area. Previously very small ski areas were in the Reykjavík area. The proposed ski area was initiated in response to increased interest in skiing at that time. The location was chosen mainly due to favourable weather conditions and proximity to the Reykjavík area. At the same time, several municipality councils in the area agreed to establish a Country Park that would include the ski area (Einarsson 1985).

Bláfjöll Country Park was established in 1973 by four local municipalities, joined by other municipalities later (Einarsson 1985). In that year, the first two ski lifts were installed. Later in that decade, ski clubs in the area also built up their own facilities, such as ski lifts and huts. The ski area became very popular among local people and further construction took place until 1984. However, little construction has taken place in the area over the last 20 years. The main focus of development in the Country Park over the last 30 years has been on ski activities within the ski area. In the period from 1999 to 2001, its operators developed a vision that included improving the Country Park's operation and services (ITR 2001).

4.2.3 A vision for Bláfjöll developed

In 1999, the operators of Bláfjöll initiated a project aimed at developing a vision for the ski area and the Country Park. Stakeholders of the ski area - including ski clubs, The Health Monitoring Agency of Reykjavík, Reykjavík Energy, the ski area personnel, The Sports and Youth Council, consultants, and an advertising agency - were involved and consulted in this initiative. Table 7 summarizes the strengths, weaknesses, constraints and opportunities identified in the project (ITR 2001).

Table 7. Advantages and disadvantages associated with the ski area operation as perceived by the operators and selected stakeholders.

<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"> • Close to urban area and good access • Good possibilities to expand the ski area and increase its capacity and diversity • Increased cooperation between ski clubs operating in the ski area • Provides good facilities and opportunity for skiing and outdoor recreation • Operated and supported by 12 local municipalities • Provides families with opportunities to participate in healthy activities 	<ul style="list-style-type: none"> • Management not efficient due to high number of members in the management board • Low carrying capacity (old ski lifts) which creates problems in peak hours • Poor marketing • Limited amount of money allocated to the ski area operation • Public transportation not suitable for users of the ski area (including elementary schools) • No systematic safety policy exists • High costs for users of the ski area (including lift tickets, equipment, and travel cost) • Short ski season, and the area is not used much in other seasons • Lift ticket system does not provide what is demanded and is not well controlled • Services for beginners, children and youth not sufficient • Poor snowboarding facilities and services • Services for visitors not sufficient (including storages as well as eating and repair services) • Facilities to run tournaments not sufficient • Inexperienced personnel that is often working for short term • Stagnation in management of the ski area. For example poor cooperation between visitors and operators • Ownership of ski lifts creates difficulties and uncertainties (some lifts are owned by ski clubs, but are rented by the ski area operators) • Limited opportunities for snowmaking in the area • Signs for hiking trails and ski runs as well as safety not sufficient

<i>Constraints</i>	<i>Opportunities</i>
<ul style="list-style-type: none"> • Uncertainty due to water conservation aspects and issues • Unstable weather • Avalanche hazard • Increased public participation in other sports and outdoor recreation activities • Prioritization of public money to fund different sports 	<ul style="list-style-type: none"> • Cooperation with companies in the operation, marketing and building of the ski area • Increased and more systematic marketing • Cooperation with sports and outdoor recreation clubs • Strengthen relation between the ski area management board and municipality councils • Improve public transportation • New ticket and sale system • Innovation in services and opening hours • New form of operation, including bids and contracts with the public and the private sector • Improve and diversify restaurant operations • New image: entertainment and outdoor recreation area for families during summer and winter • Extend the ski season by for example making snow, freezing ski hills, terrain modification, and re-vegetating hills • Increase the carrying capacity by installing new ski lifts • Increase the number of snowboarders • Connect the ski area with surrounding hiking trails • Connect the ski area with tourism • Provide long term jobs (all year round) in cooperation with other agencies • Improve services for visitors (facilities for eating, repairing and storing)

Source: adapted from ITR (2001).

Based on this work, a vision for the year 2008 was developed for Bláfjöll. The vision included (IRT 2001; SH 2004):

- establishing an efficient and viable operating structure;
- operating the area in a marked oriented fashion;
- increasing services for visitors;
- building Bláfjöll as a four season family outdoor recreation area;
- increasing the carrying capacity and viability of the ski lifts;
- doubling the number of visitors per year compared to the period from 1994 to 1999;
- improving safety;

- improving transportation to and from the ski area; and,
- taking the natural environment into account in the planning and operation of the ski area.

In order to implement the objectives laid out in the vision, in 2003 the shareholder municipalities signed an agreement that describes the objectives and budget for the development and operation of the ski area and the Country Park for the next five years (SH 2003).

Bláfjöll's vision reflects broader institutional sustainability frameworks in Iceland. The Icelandic government has been developing an overall sustainability policy over the last years, which aims at incorporating principles to sustainable development into decision-making (Umhverfissráðuneyti 1999). Sustainable development has also become the guiding principle in planning and management on local levels. Reykjavík, the capital city of Iceland, has for example developed a sustainability policy, based on the principles laid out in Agenda 21. One of the goals is that the city will become the most sustainable capital city of the North (Umhverfis og heilbrigðisstofa Reykjavíkurborgar 2004). The policy also suggests increased public participation in local decision making processes. Part of this mission is a tourism policy for Reykjavík. Reykjavík promotes sustainability when marketing, under the slogan "Reykjavík – next door to nature" (Reykjavíkurborg 2002). Tourism is increasingly becoming important for communities in Iceland. Over the last 15 years the number of tourists in Iceland increased about 200%.

4.2.4 Management structure and legislation

Bláfjöll Country Park (including the ski area) is subject to the Nature Conservation Act (Lög um náttúruvernd 1999), which guides the management of country parks. The Act

mandates that local authorities operating Country Parks establish a management board that shall cooperate and consult with The Environment and Food Agency (Figure 9). This agency is responsible for managing protected areas in Iceland. Geological formations - such as volcanic craters, lava domes, lava fields, and natural monuments - are also protected by the Act. Since 2001, the management board has also been responsible for the management of Skálafell ski area (SH 2004). In that year the shareholder municipalities established a company, Reykjavík Ski Areas, that operates the two areas under the authority of the management board. A municipal ordinance describes in more detail the management structure of the two areas (Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003). According to it, the purpose of the management board is to:

- formulate a policy for operation and construction;
- confirm operation and investment plans;
- supervise operation of the Country Park for the shareholder municipalities; and,
- hire a manager (for Reykjavík Ski Areas) and define that person's role.

The manager hires personnel, including superintendents, for the ski areas and the Country Park. The management board may also elect some of its members to a sub committee that governs the daily operation between board meetings. Today, 12 municipalities are involved in the operation of Bláfjöll and Skálafell (Figure 8 in section 3.4.1 shows some of these communities) (SH 2003): Reykjavíkurborg, Kópavogur, Seltjarnarnes, Hafnarfjörður, Garðabær, Sandgerðisbær, Grindavík, Gerðarhreppur, Vatnsleysustrandarhreppur, Bessastaðahreppur, Reykjanesbær and Mosfellsbær. Each municipality has a representative on the management board. Furthermore, the ordinance includes the following rules that apply specifically to the Country Park (Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003):

- Pedestrians have unrestricted access to the whole Country Park, and it is prohibited to restrict access by fences or other inhibitors.
- All terrain modification is prohibited in the area, except with a permit from the Environment and Food Agency.
- The area should be planned for skiing activities, however, all construction is subject to a permit from the Environment and Food Agency.
- Administrators of the Country Park may limit or prohibit traffic of motorised vehicles within the area.

Furthermore, the ordinance requires the ski area operators to consult closely with ski clubs in the area regarding operational issues.

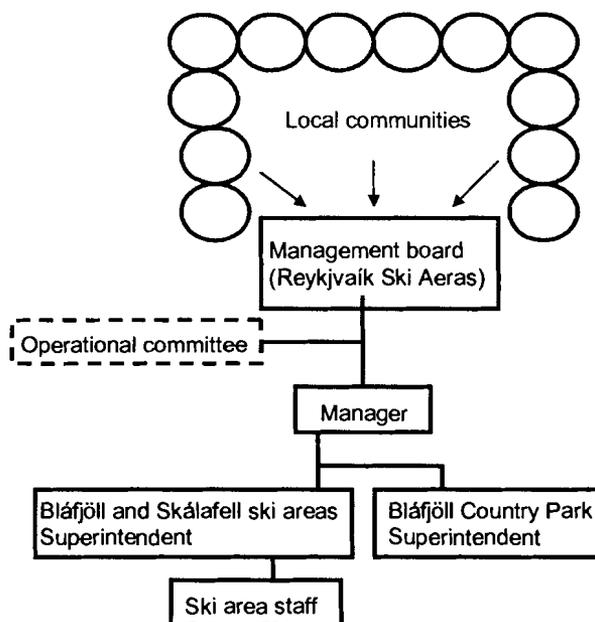


Figure 9. Management structure of Bláfjöll Country Park and ski area.

Costs associated with the Country Park are divided between the shareholder municipalities. During the agreement term (from 2003 to 2007), Reykjavík pays 70% of costs associated with operation and constructions in the Park. Other municipalities pay the remaining 30%, based on their relative population bases (SH 2003).

As previously noted, the Country Park is located within the Greater Reykjavík Water Conservation Area. Consequently, it is subject to regulation that aims at minimizing impacts on water supply. As such it defines which activities, businesses, and developments are allowed in different zones in the area (Samþykkt nr. 636 1997). The ski area is located within a zone that is defined as a main accumulation area for current and future wells. For such zones, the regulation describes in particular requirements with respect to (Samþykkt nr. 636 1997):

- storage of fuel;
- construction of roads, buildings and other constructions;
- sewage treatment;
- waste treatment;
- business activities;
- livestock use; and,
- cultivation and vegetation programs.

Two other regulations that discuss health and pollution matters apply to the ski area operation:

- Regulations for water protection (Reglugerð nr. 796 1999); and,
- Regulations for polluting business (Reglugerð nr. 785 1999).

The Health Monitoring Agency of Hafnafjörður and Kópavogur Area is responsible for environmental and health supervision in the ski area, because the ski area is located within the jurisdiction of Kópavogur. The Country Park is, however, located within 7 municipalities (Landmælingar Íslands 2001).

4.3 Management concerns

Negative impacts and other key management concerns associated with the operation of the ski area and the Country Park are summarized in this section. Operators and other stakeholder groups that are involved in the operation of Bláfjöll, were asked to identify these issues. As well, documented information on the Country Park and the ski area provided additional insights concerning these issues.

4.3.1 Environmental impacts and management concerns

Implementing Bláfjöll's vision will require construction activities, including (Orion 2003):

- installing new and moving existing ski lifts;
- terrain modification in order to build ski lifts and improve ski runs;
- enlarging and improving existing parking lots as well as adding new ones;
- installing fences to accumulate snow;
- improving lighting for the cross country area; and,
- improving roads within the ski area.

The potential impacts resulting from these construction activities are described in a report that was prepared for the operators and submitted to the Planning Agency, as required by the Environmental Impact Assessment Act (Lög um mat á umhverfisáhrifum 2000; Orion 2003). The Planning Agency ruled that the construction would not have significant environmental impacts and would, thus, not be subject to environmental impact assessment (Skipulagsstofnun 2003). The ruling was based on references from a number of government agencies with responsibilities and interests in the matter. These references assumed that:

- the number of visitors would not increase significantly, and thus new facilities to service such increase would not have to be built in the near future;
- the construction would not have significant impacts on vegetation; and,
- the construction would not have significant impacts on geological formations.

The ruling required Bláfjöll's operators to minimize impacts on vegetation and geological formations during the proposed construction phase. Also, the operators were required to prepare a local plan for the area, in consultation with stakeholders having an interest in, and responsibilities for, ground water and natural conservation in the area (Skipulagsstofnun 2003).

The operators were asked to identify environmental effects associated with the ski area and the Country Park. They felt that the most significant impacts associated with the ski area operation were on:

- ground water resources in the Water Conservation Area; and,
- landscapes and vegetation.

Bláfjöll's stakeholder groups, including agencies responsible for environmental matters in the area, also perceived these as the most important environmental issues in fostering sustainable management practices for the area. Further discussion on these issues follows.

4.3.1.1 Impacts on ground water

Preventing contamination of ground water is perceived, both by the operators of Bláfjöll and their key stakeholders, to be the biggest environmental issue affecting the sustainable management of the area. The stakeholders were especially concerned about this issue, because ground water pollution in Bláfjöll could potentially affect all fresh water wells that Reykjavík Energy utilizes in order to supply Greater Reykjavík with fresh water

(Stefánsson, telephone conversation on January 15, 2004; OR 2004). The fresh water is pumped untreated to consumers, yet still fulfils demanding international water quality standards. Indeed, the water is recognized internationally for its high quality (Gissurarson 2003; OR 2004).

The ski area operation requires usage of substances that can pollute ground water, such as oil (fuel, lubricants and hydraulic oil) (Línuhönnun 2000). Bláfjöll's visitors can also have potential impacts on the water resources, for example from oil leakage from vehicles (Stefánsson 2003). Pollution resulting from activities in the area can be derived from either point or diffuse sources (Línuhönnun 2000). Point pollution sources are for example drainage from a work sheds or other buildings. Conversely, visitors create diffuse environmental impacts on water resources in the area. These include all activities that result from increased number of visitors in the area, including pollutant run-off from parking lots (Línuhönnun 2000).

A study initiated by Reykjavík Energy looked at the implications of construction and operation of the ski area on fresh water supply in the Water Conservation Area (Línuhönnun 2000). It estimated the probabilities of oil leaking into the bedrock and the consequences it would have for the ground water in the Water Conservation Area. The results indicated that an accident involving leakage from a tank car containing 3800 litres of fuel would not be sufficient to pollute Reykjavík Energy's fresh water wells. It suggested, however, that long term diffuse oil pollution from the ski area operation was a more significant concern. The study pointed out the importance of careful handling of oil - including fuel, lubricant, and other chemicals - in order to prevent ground water contamination in the Water Conservation Area (Línuhönnun 2000). Table 8 summarizes some of the key potential impacts and their implications on water resources.

Table 8. Sources and implications of various ski area related impacts on ground water resources in Bláfjöll.

Source of impact	Implications
<ul style="list-style-type: none"> • <i>Oil (fuel, hydraulic oil and lubricants)</i> Cars 	Studded tyres tear up asphalt roads and the debris drains into the ground water. In addition, water that drains from parking lots may be contaminated with vehicle fuel and lubricants. Off road driving within the Country Park also increases potential ground water contamination.
Snowmobiles and snow cats	Snowmobiles, (both used by the operators and the public) contain fuel and lubricants which can contaminate ground water. Snow cats require a considerable amount of fuel and hydraulic oil (under pressure) which increase the probability of ground water contamination.
Ski lifts	Ski lifts use a considerable amounts of hydraulic oil and lubricant. Their oil hoses can fail, thereby creating oil spills. In addition, zinc that drains from galvanized ski lifts can increase ground water contamination levels.
Storage of oil and other chemicals	Oil, paint and other chemicals, that are stored in sheds can leak. Furthermore, snowmobiles and snow cats that are repaired in those facilities cause oil and lubricant discharges.
Fuel tanks	About 3800 litres of diesel oil and 1000 litres of gasoline are stored in tanks in the area. These fuels contaminate ground water if they leak and also when tanks are being filled.
Transportation of oil	About 25 tonnes of oil and 1.5 tonnes of petroleum are transported annually to the ski area. Accidents during transportation of these fuels may contaminate ground water supplies.
During construction	During construction, the usage and amount of oil and lubricants in the area expands, which increases probability of oil leakage.
• <i>Sewage</i>	Septic tanks can manage sewage from the current number of visitors. Sewage is mainly a point source of pollution in ski areas and may include bacteria (that can live for 2-4 months) and viruses (which can live for years). Of particular concern is the pressure on the septic tanks during high peak periods.
• <i>Solid waste</i>	Solid waste in the area is put in 20-25 m ³ containers that are emptied regularly. Solid waste is not believed to have significant negative impacts on ground water in the area.
• <i>Usage of fertilizers</i>	Fertilizers are used to re-vegetating ski hills. Vegetation binds the snow and makes the ski hills ski-able sooner. Artificial fertilizers generally include nitrogen (KNO ₃ and NH ₄ NO ₃) which contaminates ground water. Other organic fertilizers are recommended in the area instead.
• <i>Mines</i>	Several mines area located within the Country Park. Their operation requires usage of machines using and carrying oil and other chemicals which increases potential impacts on the ground water.

Source: Linuhönnun (2000); Jónsdóttir (2003); Stefánsson (2003), Stefánsson, telephone conversation January 15, 2004.

Government agencies and companies with responsibilities and interests in this matter are seeking to collaborate in addressing the minimization of these ground water impacts.

Reykjavík Energy has for example, been willing to support the development of environmental measures aimed at minimizing impacts on the fresh water in the area (Gissurarson 2003). Those practices are further discussed in section 4.4.1. These parties are especially concerned about the implications of expanding and increasing the number of visitors in the area (Gissurarson 2003; Línuhönnun 2000; Skipulagsstofnun 2003; Stefánsson 2003).

Food companies and exporters of bottled water from the water conservation area, also have an interest in keeping the water supply uncontaminated. They have expressed concern about the ski area's actual and perceived impacts on the environmental quality of products produced in the area (Þórðarson, communication by email on February 3, 2004).

4.3.1.2 Impacts on Landscapes and vegetation

During construction

The building of ski lifts, ski runs, parking lots and roads requires terrain modification that involves movement and displacement of soils in the area (Orion 2003; Þorvarðardóttir and Friðriksdóttir 2003). These activities can have negative impacts on geological formations, vegetation and visual landscapes. The construction phase in the ski area will require a displacement of about 50,000 cubic metres of material (Orion 2003). This phase also includes the installation of a chair lift that will affect a tuff crater, located at the top of the area's highest ski hill (Orion 2003; Skipulagsstofnun 2003). This new lift also requires upgrading of an existing trail to the lift site, for construction and maintenance.

Development and construction of new ski runs also requires significant terrain

modification. Indeed, it requires more terrain modification than the actual installation of the ski lifts (Orion 2003).

Ski area operations

Visitors to the area can also have negative impacts on the area's landscapes and vegetation. Hiking, which is encouraged throughout the Park, has been mainly limited to a few areas, such as Eldborg, which is a volcanic crater and natural monument (Hjaltason 2003). Trampling in some of these areas over the last decades has had disastrous impacts on moss (Bragason 2003; Hjaltason 2003). Currently, the operators of Bláfjöll do not view this as a significant problem. They have been more focused on development of winter activities in the ski area, when such impacts are not experienced. However, an increased number of activities in the area, in particular during low ski season, is likely to increase environmental impacts on geological formations (such as caves) and vegetation (Bragason 2003; Hjaltason 2003; Jónsdóttir 2003).

Off-road driving of SUVs and snowmobiles is prohibited within the Country Park (Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003). When it has occurred, off-road driving has had significant negative visual impacts on vegetation. These impacts can lead to soil erosion. The operators have, however, not been able to enforce the off-road vehicle prohibition. This is perceived by Bláfjöll's operators and agencies responsible for environmental supervision in the area, to be a significant problem that needs to be solved (Stefánsson 2003; Bragason 2003).

Effects on landscapes and vegetation may also have negative visual impacts. Some of the operators' personnel and management interviewed in this study, viewed such impacts as a constraint for attracting visitors in the summertime. They felt that people

would choose other less impacted wilderness areas for participating in outdoor recreation activities. Other visual impacts are discussed in the next section.

4.3.1.3 Visual aesthetics

The building of and/or alterations to facilities in the area, such as ski lifts, lodges, huts, and snow fences, can also create visual impacts that may have negative effects on the visitors enjoyment on the site (Orion 2003; Jónsson 2004).

A large amount of solid waste and litter that is associated with the ski area operation, both from the operators and the visitors, also has visual impacts on the area. The Environment and Food Agency pointed out the importance of keeping protected areas clean, because it increases visitors' respect for environmental resources (Bragason 2003). The operators felt that waste management could be improved, for example by encouraging the recycling of waste materials.

4.3.2 Social impacts and management concerns

The ski area operators identified a number of social impacts and management concerns associated with the ski area operation. These included issues associated with:

- community benefits;
- ensuring the safety of ski area personnel and visitors; and,
- visitor's enjoyment.

4.3.2.1 Community benefits

Community benefits are perceived to be very important outcomes associated with the operation of the ski area and Country Park in Bláfjöll. Profit motives have not been paramount in the mission of past ski area operations. The ski area has operated with a

deficit in all seasons since it was established (Sigurfinnsson, telephone conversation June 9, 2004). Generally, half of the operational cost is covered by revenues from the ski area and the other half by the shareholder municipalities (Hermannsson 2003). According to Bláfjöll's vision, one of the main objectives of the ski area is to increase the efficiency and viability of the operation (ITR 2001).

The vision also highlights the social importance of Bláfjöll for the local communities. The interviews with the operators of Bláfjöll reflect this as well. In particular, they revealed the social significance of the area for families, children and youth. Local governments which participate in the Country Park and the ski area operation, view it as a part of the communities' social welfare system, like that associated with many other sports facilities operated or funded by municipalities. The operators also believe that skiing has an advantage over many other sports, because it is one of the few activities in which the whole family can participate. In addition, snowboarding appeals to a group of youth that often does not participate in other sport activities. The operators believe that the Country Park and the ski area benefit local residents both physically and mentally by providing families, children and youth with opportunities to participate in healthy leisure and sport activities. They want to see the ski area evolve into a community centre rather than a place that is only available for wealthier individuals and families. Interviews with parties involved in social and community development support those views (Sörheller 2003; Hrafnkelsson 2003). Their perspectives are further discussed in section 4.4.3.

Ski clubs operating in the area provide opportunities, in cooperation with the ski area operators, for children and youth to practice skiing. The ski clubs motivate children to pursue skiing, because their experience has shown that it increases social development

and reduces social problems by: increasing self esteem, making them self-supporting, reducing the risk of engaging in unhealthy activities, and motivating them to respect and appreciate the natural environment (Björnsson 2003; Sigurðsson 2003).

Other stakeholders suggested that the operators of Bláfjöll should provide greater access for disabled people to the area (Sörheller, 2003; Þorvarðardóttir and Friðriksdóttir 2003). Furthermore, respondents involved in the management of protected areas suggested that such outdoor recreation areas should provide educational values to surrounding communities (Bragason 2003; Þorvarðardóttir and Friðriksdóttir 2003). They felt that the Country Park should help educate visitors about the natural environment of the region. The operators felt that a real opportunity existed to help increase awareness of the ski area's environmental work through strong educational programming.

4.3.2.2 Safety

One of the priorities in the ski area operation is to minimize safety risks for visitors and ski area personnel (SH 2004; ITR 2001). This includes addressing safety considerations in daily operation associated with (SH 2004; Stefánsson 2003; Bragason 2003):

- equipment, such ski lifts and usage of operator's vehicles in the ski hills and the cross country area;
- ski runs; e.g. accidents in ski runs, due to physical or man made facilities;
- off road driving of public snowmobiles and SUVs. Visitors can unexpectedly encounter off-road vehicles; and,
- avalanches; the ski area includes steep ski hills and often much snow which can create potential avalanche hazard.

4.3.2.3 Visitor's enjoyment

In their push to make the area a market-driven facility, the Bláfjöll operators are intending to provide high quality experiences for their visitors. However, they are concerned about potential conflicts between different users of the ski area. These are in particular associated with potential conflicts between:

- snow boarders and downhill skiers; and,
- ski club participants and the public.

In addition, the operators felt that visitor's enjoyment could be enhanced by informed personnel.

4.3.3 Physical management constraints

One of the biggest management constraints for the ski area operators is the lack of snow in the area (SH 2004). Over the last few years, weather conditions have been unstable and rapidly changing. In addition, the ski hills are only covered with limited vegetation and require thus more snow in order to be ski-able. Thus far, artificial snowmaking has not been viewed as a feasible alternative to natural snow, due to the lack of surface water in the area. During the last 13 years, the ski area has been open for an annual average of 52 days per year (Sigurfinnsson, telephone conversation June 9, 2004). However, it has operated for about 30 days annually during the last four seasons. On the other hand, a relatively high number of visitors come to the ski area when it is open. For example about 35,000 guests visited the ski area during the 25 days it was open in the 2003-04 season. The operators claim that weather uncertainty makes long term planning, and systematic strategies to improve the ski area operation, difficult from a facility management

perspective. In addition, some respondents felt that the ski area is constraint by short ski runs, that cannot satisfy visitors need.

Some respondents felt that unfavourable weather conditions and an unattractive natural environment were significant obstacles to developing the area as a multiple season resort destination (Hermannsson 2003; Hjaltason 2003; Þórisson 2003). Seasonal employment problems have also resulted in a high staff turnover of ski area personnel.

4.4 Sustainability management practices

Previous sections have focused on identifying the main sustainability issues associated with the future development and operation of Bláfjöll. Bláfjöll's vision includes a commitment to incorporating natural environment values and principles into the planning and operation of the area (ITR 2001). The stated priorities in the construction phase of this ski area development are to improve the area's safety and services whilst enhancing the efficiency of the operation (ITR 2001; SH 2004). According to the operators, management strategies for the last two years - which aimed at attracting more visitors, increasing the usage of the area, and improving operational efficiencies - have been quite successful (SH 2004; Sigurfinnsson, telephone conversation June 9, 2004). These strategies include:

- improving ski runs by installing snow fences and modifying terrain in ski hills;
- purchasing new ski lifts as well as upgrading and move older lifts;
- enlarging and improving parking lots;
- offering more flexible opening hours;
- re-vegetating ski hills in order to increase the time they are ski-able; and,
- offering organized trips to the area during summer.

In the near future, the goal of improving transportation services and the ticketing system (adopt an electronic system) will be addressed.

This section describes existing daily sustainability management practices in the operation of the ski area, and the rationale for their implementation. The discussion is divided into environmental and social practices.

4.4.1 Environmental management practices

Interviews with Bláfjöll's operators and their stakeholders demonstrated that the operators are very ambitious with respect to their management practices. As noted in section 4.3.1, ground water conservation is perceived to be the biggest environmental constraints to the daily operation of the area. These concerns have led to the development of management strategies for Bláfjöll. They are designed to minimize the risk of ground water contamination. The strategies have been developed in cooperation with Reykjavík Energy and the Health Monitoring Agency of Hafnarfjörður and Kópavogur Area. They include the:

- systematic inspection of ski lifts and vehicles every month by the ski area personnel, using a checklist system approved by Reykjavík Energy;
- documentation of oil spills and transportation of oil and chemicals;
- development of an emergency plan for oil spillage;
- collection of oil waste; and,
- monitoring of oil transportation practices to the area by a representative from Reykjavík Energy.

As previously noted, the Health Monitoring Agency of Hafnarfjörður and Kópavogur Area is responsible for health and environmental supervision in the area. However, due to the great interest that Reykjavík Energy has in conserving water sources, it is involved in

encouraging and developing water conservation practices (Gissurarson 2003; Stefánsson 2003). Indeed, the measures listed above were the prerequisites, set by Reykjavík Energy, for further construction in the area (Línuhönnun 2001).

While the operators do not perform other organized environmental initiatives on a daily basis, their management strategies do include measures that aim to minimize adverse environmental impacts. Their management activities include:

- minimizing visual impacts from terrain modification and built facilities by sowing in eroded areas, in order to mitigate for the loss of vegetation;
- maintaining clean and tidy landscapes by limiting visible litter and waste;
- conserving heating and water usage in washrooms; and,
- reducing noise on ski hills by using the operator's most quiet snow cats.

Construction in the area, which is subject to permits because the area is protected, is guided by government agencies (Lög um náttúruvernd 1999; Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003; Samþykkt nr. 636 1997; Skipulagsstofnun 2003). The operators of Bláfjöll claim that they often go beyond what environmental legislation mandate, in particular by collaborating with government agencies and other stakeholders. Stakeholder relationship is further discussed in section 4.4.3.

4.4.2 Social management practices

The management of Bláfjöll feel that addressing relevant social concerns is very important to the long term sustainability of the area. Social management practices include:

- safety measures;
- visitor management activities;
- training and education programs; and

- stakeholder relationship initiatives.

Further discussion of these social management practices follows.

Safety measures

The operators have used several management strategies to improve safety for visitors and ski area personnel. These include (SH 2004; SH 2004b; Skipulagsstofnun 2003;

Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003):

- modifying ski hill terrain to reduce danger for skiers;
- developing a visitor chair lift exit plan in the case of ski lift emergencies;
- evaluating avalanche hazard when required. The process is based on avalanche evaluation guidelines that have been developed for the ski area in Bláfjöll;
- installing safety signs for visitors by ski lifts and in ski runs. The signs guide people on how to use the ski lifts safely and where to ski;
- communicating safety information on Bláfjöll's web site, regarding how to use ski lifts and how to ski safely;
- limiting snowmobile and snow cat usage within the ski area;
- prohibiting all public off-road driving within the Country Park; and
- improving parking lots and roads in the ski area in order to minimize accidents.

The operators contend that current safety measures in the area are in much better shape than they were a few years ago (ITR 2001; Sigurfinnsson, telephone conversation June 9, 2004).

Visitor conflict management

Two main strategies are intended to minimize conflicts between different user groups.

They are:

- ski club training programs, which require considerable space in the ski hills, can lead to conflicts between the ski clubs participants and general visitor population.

This is minimized by avoiding those groups skiing at the same time at the same place. For instance, ski competitions organized by the ski clubs are held at low peak traffic hours, so as to avoid conflict between those parties and other skiers; and,

- conflicts between different visitor groups (e.g. snowboarders and skiers) are avoided by encouraging them use specific sites.

Training and education of personnel

The ski area operators have recognized the importance of developing well-trained personnel for their areas. Strategies they have implemented to increase the capacity of their personnel are summarized in the following list (SH 2004):

- At the beginning of each ski season, ski area personnel attend a course that discusses safety and visitors' services. The course does not, however, address environmental concerns.
- A handbook to guide and enhance the ski area personnel's practices has been published by the operators (SH 2002). The handbook, for example, discusses safety and employment conditions.
- Personnel are given an opportunity to work for the Sports and Youth Council during off seasons, in order to minimize turnover of personnel.

4.4.3 Collaborative stakeholder relationship

The operators of Bláfjöll were asked to identify their key stakeholders. They were also asked to describe the character of the relationships they had with those stakeholders, and how they benefited from collaborating with them. These stakeholders were then asked for their views on the nature of their relationship with the operators of Bláfjöll. The following section describes this relationship and how it can contribute to sustainable development in the area.

The Bláfjöll operators contend that good relationships and cooperation with their stakeholders is a key to the sustainable management of the Country Park and the ski area. For example, in long term planning, as well as the development of the local area plan and the vision for the area, the operators for example held meetings with interested parties in order to take their interests into account (ITR 2001; Sigurfinnsson, telephone conversation June 9, 2004). According to the operators, their most important stakeholders were:

- visitors and local communities;
- government organizations responsible for environmental, conservation, health and safety matters;
- the operator of waterworks in Greater Reykjavík (Reykjavík Energy); and,
- ski clubs in the area.

They also viewed NGOs and the private sector as important stakeholders in future development in the area. A discussion of the role of these stakeholders in sustainable management of the area follows.

Visitors and local communities

The operators view visitors as one of their key stakeholders. Much effort has been made to improve services for the visitors. As one of the ski area management stated, the focus of management is no longer only on “machines and engines” but rather on improving services for current and potential visitors (Hermannsson 2003). They perceived collaborative activities with visitors to be very important in the sustainable management of the area for several reasons. Firstly, collaboration and communications with users of the area was considered important to informing these stakeholders about management goals and challenges. They felt that such collaboration and communication would help to

manage visitor service expectations. Secondly, communication with visitors is also intended to provide information about the area, such as the natural environment, services provided on the site, physical conditions (weather and road conditions), and safety (SH 2004; SH 2004b). Thirdly, the operators viewed such relationships as being important to meet visitors need. Initiatives to encourage collaboration with visitors included:

- providing visitors with opportunities to communicate with ski area management through the ski area website. This includes small web surveys about the ski area services and expectations. It also provides opportunities to write comments to the ski area management, which try to respond to all comments;
- conducting formal surveys about the quality of the ski area's services and potential improvements; and,
- holding regular meetings with groups of people that represented visitors' interests.

The operators have also tried to improve community linkages. In cooperation with the Sports and Youth Council of Reykjavík, they are currently developing and creating programs and initiatives for youth in the ski area and the Country Park (Hrafnkelsson 2003). The operators have also planned organized events in the ski area that are intended to attract visitors and increase the area's linkages with the local communities (Jónsdóttir 2003).

Environmental, health and safety government organizations

The operators felt that collaboration with government organizations is very important. Those involved with protecting and utilizing water resources, as well as the management of protected areas and safety in workplaces were considered especially relevant stakeholders. As a ski facility and outdoor recreation area operating in a protected area (a Water Conservation Area and a Country Park), the operation is subject to many

regulatory conditions and requirements (see section 4.2.4). This is especially the case with respect to construction activities (Lög um náttúruvernd 1999; Samþykkt nr. 636 1997; Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003). Consequently, getting necessary approvals and certificates is often a slow and complex process, which can encumber ski area development. The area's operators think that environmental and safety regulations are often unclear. Development and management requirements, and other responsibilities required by government agencies, tend to make development options discretionary rather than objective in character. The operators believed that increased collaboration, that aims at complying fully with all regulatory requirements, would benefit the ski area operators in overcoming these obstacles.

Respondents from the government organizations also viewed collaboration as an essential part of sustainability management of the ski area (see section 4.4.1). They felt that collaboration could help them with monitoring and minimizing environmental impacts, and that increased collaboration would be advantageous in gaining approval to future developments in the area (Stefánsson 2003). They felt that such collaboration could save time and money for the operators in meeting regulatory requirements (Bragason 2003). In general, they thought that the relationship with the operators has been good and successful (Bragason 2003; Gissurarson 2003; Stefánsson 2003).

Cooperation with government organizations involved in conserving and utilizing water resources has made it possible for the operators to shape and influence monitoring practices, aiming at minimizing ground water contamination. It is difficult to regulate specific business and activities like ski area operation. Consequently, collaborative relationships were deemed to be important to improving decision making and making the area more sustainable.

Ski clubs

Ski clubs have their own facilities and activities in the ski area. These include ski lifts which they rent to the operators. Consequently, a close relationship between the ski clubs and the operators is required. Some of the ski clubs have been involved in the ski area operations since the ski area and the Country Park were established in Bláfjöll in 1973 (Björnsson 2003; Einarsson 1985; Sigurðsson 2003). They view themselves as pioneers in the area, and feel they should have an influence in how the ski area is operated (Sigurðsson 2003). The operators recognize this special relationship and meet once every month with representatives of the ski clubs. The ski clubs were also involved in developing the ski area's vision in 1999-2001 (ITR 2001). The ski clubs and the operators agree that the ski clubs have good opportunities for expressing their management concerns to the ski area operators (Björnsson 2003; Sigurðsson 2003). Several members of the ski area's management boards have also been active in the management of the ski clubs. The ski club members consider this to be an advantage. However, some of the ski area management felt that this could lead to organizational conflicts.

While the relationship between the operators and the ski clubs has been characterised by conflicts over the years, currently the parties agree that the level of collaboration has improved dramatically with the organizational restructuring and improved management practices over the last years (Björnsson 2003; Sigurðsson 2003).

Non-governmental organizations (NGOs)

The operators feel they can strengthen their ski area operations by consulting with NGOs that often have knowledge about specific issues in the area. They are working on a project with a NGO that aims at re-vegetating the ski hills. Increased vegetation in the ski hills

can help to bind the snow. This will help to increase the time the ski hills are ski-able. The ski area's goal for this project is to increase the number of days available for skiing in the area. The idea is also to involve youth in local communities in this initiative (Jónsson, B.G. 2004). According to the operators and the NGO, this initiative has been very successful. Getting approval for this project was, however, a long process, because it is within the Water Conservation Area. This initiative demonstrated that collaboration with government agencies is a key to effective management of the area, particularly in order to minimize the time required to get necessary approvals and permits. The operators and their stakeholders also see an opportunity for Bláfjöll to increase relationships with other non governmental organizations and societies, especially regarding the development of recreation activities. An example of this would be collaboration with the speleological society which is interested in the utilization of the area's caves for recreational purposes (Jónsson, S.S. 2003).

Private sector

The operators are interested in working and collaborating with the private sector in the future, including outdoor stores. This can improve and provide more diverse services on the site. In the Skálafell ski area (operated by Reykjavík Ski Areas), companies have funded the purchase of a snow-boarding half pipe. In return, the operators have advertised the sponsoring companies at the ski site.

4.5 Improving sustainable management practices

This section summarizes the respondent's suggestions for improving sustainable management of the area. Respondents had different opinions about how to successfully manage the area in a sustainable fashion.

4.5.1 Environmental management practices

Most respondents thought that outdoor recreation development could coexist with water conservation programs, if managed properly (Bragason 2003; Gissurarson 2003; Stefánsson 2003). They were more concerned about the consequences of potentially increased number of visitors, rather than current problems in the area's operation. It should be kept in mind that it is unusual to have a ski area and outdoor recreation area within a water conservation area that supplies an urban area (Línuhönnun 2000).

- *Improved collaboration with government agencies*

As previously discussed (in section 4.4.3) the respondents from the government agencies thought that improved collaboration with the operators of Bláföll would improve the operation and make it more sustainable. They found that such collaboration was especially relevant regarding long term planning of the area (Bragason 2003; Gissurarson 2003; Stefánsson 2003).

- *Responsibility*

The Health Monitoring Agency found it very important to have one party responsible for all development in the area (Stefánsson 2003). The Agency suggested there was a need to clarify who is responsible for activities and construction in those areas subject to permits and conditions.

- *Improving public practices and behaviour*

The Health Monitoring Agency also contended that further improvements in environmental management of the area, in particular with respect to ground water impacts, could be achieved by improving public practices and behaviour. Environmental

awareness could for example be enhanced by visitors' educational programs (Bragason 2003; Stefánsson 2003).

- *Clear requirements and rationale decisions*

The operators called for clearer and stricter regulations regarding environmental, health and safety matters. Furthermore, they contended that all decision making in the area's operation and development should be based on studies and professional arguments, rather than feelings or discretionary decisions. They wanted to know the specifics of their mandate, so that they could develop environmental programs and practices in cooperation with stakeholders, in order to meet regulatory requirements.

- *More information*

In general, the stakeholders and the operators agreed that existing management programs aimed at protecting ground water sources had been successful and effective. It is however, difficult to measure the potential long term diffuse pollution resulting from the operation (Línuhönnun 2000). More detailed information is needed on ground water flow and pollution diffusion, in order to evaluate consequences of the ski area and Country Park activities (Stefánsson 2003; Línuhönnun 2000). In addition, there is a need for more information on vegetation and carrying capacity in the area (Þorvarðardóttir and Friðriksdóttir 2003). Such information could help to prevent environmental impacts by providing part of the foundation needed to implement a sustainability management system for the area.

4.5.2 Social management practices

Visitor surveys show that visitor satisfaction has been increasing at the ski area over the last few years. It is also evident that the public is interested in using the area while it is open. Consequently, it may be argued that strategies that aim at attracting visitors and improving services have been successful. However, the respondents suggested several ways to improve sustainable management of Bláfjöll.

- *Educate personnel*

The ski area and Country Park operators have noted that the success of sustainability management practices depend on the personnel involved. The operators and stakeholders felt it was important to increase the education of personnel regarding safety, as well as the implementation of environmental and natural environment management procedures. This could, for example, be addressed in training program personnel takes during the fall.

- *Educate visitors*

As previously noted, protected areas managed in a sustainable fashion should have an education value (Bragason 2003; Hrafnkelsson 2003). Educational programs (for example by using face to face interpretation, signs, and Bláfjöll's website) could be used to raise sustainability awareness among visitors.

- *Strengthen collaborative relationships with local communities*

Respondents identified several opportunities for developing new and strengthening existing stakeholder collaborations. Cooperation with elementary schools and social development agencies could enhance community linkages and increase the usage of the area. In addition, collaboration with outdoor recreation and travel societies could stimulate the sustainable development of new and more diverse activities in the area.

- *Provide more diverse outdoor recreation opportunities*

Many respondents felt that the operators of Bláfjöll should focus more on enhancing outdoor recreation opportunities in the Country Park. This includes increasing and improving hiking trails in the area, as well as improving access to lava caves in the Park. At the same time, increased number of summer visitors in the future may require the operators to adopt new visitor management strategies. Such strategies could for example include guiding visitors to specific places while protecting others (Bragason 2003).

4.5.3 Future development and operation

Recent changes in management practice include organizational restructures and increased stakeholder collaboration. These investments, along with increased financial resources to improve services in the area, will allow the operators to re-build a more sustainable ski area and Country Park. There are signs that these changes are improving the economic viability of the ski area. Key stakeholders support, or at least accept, the presence and role of the ski area operation, although some argue it is controversial to operate a ski area on a water conservation area. It will, however, be critical for the operators to maintain this support of the ski area operation in the future. Different opinions exist about the feasibility of developing the area into a four season destination, mainly due to physical characteristics of the area, as previously discussed.

In general, the respondents viewed the impacts associated with the area as costs that need to be paid in order to provide local communities with outdoor recreational services. However, they also felt that more focus could be placed on minimising environmental impacts, particularly in matters relating to the water sources and impacts on the land. It is, however, especially challenging to improve the ski area's operation,

given the existing weather constraints. The fact that the ski area is located in a protected area requires the operators to consider environmental impacts in their operation. Indeed, they have viewed this as an opportunity to improve environmental and other sustainable management practices. As long as the Country Park is managed in a sustainable fashion (water resources protected), other activities, perhaps with more negative impacts, will not be develop in the area (Stefánsson 2003).

4.6 Summary

This chapter has identified the key sustainability issues associated with the management of the ski area and the Country Park in Bláfjöll. It has also described how the operators of Bláfjöll address those issues, both during construction stages and in daily operations. Finally, it has provided recommendations for improving the operators' sustainability management practices.

The Bláfjöll Country Park has the mandate to provide ski and other outdoor recreational activities for local communities. At the same time, it has the mandate to protect resources in the area, including fresh water. The key issues that need to be considered in the sustainable management of the area are shaped by those facts. These issues include:

Environmental

- Impacts on water resources
- Impacts on landscapes and vegetation
- Visual aesthetics

Social

- Community benefits
- Safety of visitors and personnel
- Visitor's enjoyment

Stakeholders have been especially concerned about future development of the area and potential implications for the ground water in the Water Conservation Area. The Bláfjöll's operators have tried to minimize environmental impacts and maximise social

benefits by collaborating with stakeholders, in particular government organizations and the public.

Many of the suggested strategies for improving sustainable management of the area include improving this stakeholder collaboration. Indeed, there is a very good opportunity for the operators to further enhance relationship with parties with an interest in fresh water sources in the area. Stakeholder collaboration may also be valuable for future development of the area, which will include new activities that may have negative environmental effects associated.

General support from local communities, the public, environment government agencies and other stakeholders, is critical for future operation of the ski area. A systematic framework to address the issues that have been discussed in this chapter might help to provide such support. The operators are prepared to adopt such framework.

CHAPTER 5: MANAGEMENT IMPLICATIONS

5.1 Introduction

This Chapter discusses potential management implications associated with the findings of this study. First, the themes related to sustainable management of Bláfjöll are highlighted. The second section introduces the suggested SMS model. The third section describes the application of the model and provides management recommendations for the operators of Bláfjöll.

5.2 Themes

The key issues in the sustainable management of Bláfjöll can be classified into 3 themes. They include social, environmental, and economic dimensions of sustainability, both at the destination and within the local communities.

5.2.1 Environmental impacts

Earlier in this research, environmental impacts and management concerns associated with ski area operation were summarized (section 2.6.1. and appendix B). Chapter four demonstrated that the need for addressing many of those issues in Bláfjöll is essential. The Country Park is a protected area subject to legislations which aim at protecting landscapes (Lög um náttúruvernd 1999; Samþykkt fyrir stjórn SH og Bláfjallafólkvangs 2003). The area is also located within a Water Conservation Area, which supplies the majority of people and businesses in Greater Reykjavík with fresh water. Consequently, a number of stakeholders have an interest in protecting the area's water resources from

contamination. Diffuse source pollution from the area has been identified as a big concern in the effort to conserve the fresh water in this area (Línuhönnun 2000). A key to address such pollution is effective management and planning, rather than technical solutions (Línuhönnun 2000). The operators of Bláfjöll have, in cooperation with their stakeholders, developed measures to protect water resources in the area (see section 4.4.1). Other environmental management strategies that the operators apply are not very systematic, and do not address some of the environmental issues identified in the literature, such as solid waste management (recycle, reuse and reduce) and energy usage. If the ski area and the Country Park are aiming at sustainability, all these issues then need to be managed in a systematic way.

5.2.2 Social concerns

Community benefits

The local communities that operate Bláfjöll perceive the area to be socially very important. Indeed, the key motivation for the operation is its contribution to quality of life. The area provides visitors with physiological and psychological benefits. The Bláfjöll operators have for the past few years focused on strengthen the relationship with visitors in order to maximize these benefits.

Protected areas that have the main objective of protecting landscape and providing outdoor recreation opportunities have the potential to act as models of sustainability, with a view to developing lessons for wider applications in local communities (IUCN 2002). An example of this, which is one of the principal benefits of tourism in protected areas, is the opportunity to provide better knowledge and awareness of conserving natural and cultural values among visitors and local people (IUCN 2002; Dearden and Rollins 2002;

Eber 1992). Such initiatives are currently not in place in the operation of Bláfjöll. There is also an opportunity to strengthen linkages between the area and local communities. More collaboration with social agencies (elementary schools and social services) and NGOs could enhance the benefits that accrue to the local communities. The proposed SMS provides a framework for the development of education initiatives and community linkages.

Visitors' enjoyment

A key goal of the Country Park is to provide outdoor recreation opportunities for local communities. In order to be managed sustainably, the destination must maximize visitor enjoyment (Eber 1992). The Bláfjöll operators have addressed this by increasing services for visitor in the area, educating and training personnel, and minimizing conflicts between different groups of visitors. Future development of the area will likely include an increased number of visitors, in particular during summers. In addition, new activities will probably be introduced. This will require the operators to focus more on visitor management and social and environmental carrying capacity of the area. Such concerns are more or less excluded in the operation today. Improved training strategies for personnel and enhanced communication with visitors, can also enhance visitor enjoyment. The proposed SMS model provides an opportunity to address these areas that need improvement in the area's operation.

Safety and health

The operation of Bláfjöll is subject to a number of health and safety standards and legislations. The health standards address for example water quality, adequacy of sewage, operation of restaurants as well as safety of equipment, such as ski lifts. Other safety

issues, such as conditions of ski runs and safety of skiers and personnel on the ski hills are not addressed in those legislations. Safety for visitors and personnel has been one of the priorities in the improvement of the operation of Bláfjöll. As discussed in Chapter two (section 2.2.), health and safety have been identified as critical components of sustainable development (WCED 1987; Fraser Basin Management Program et al. 1995). Safety and health issues need, however, to be constantly considered and monitored. A systematic framework, that clearly defines goals and management strategies to accomplish the goals, would strengthen safety and health practices in the operation. It would also ensure that personnel is well trained in those areas, for example in evaluation of avalanche hazards.

5.2.3 Moving towards sustainability by stakeholder collaboration

The operators of Bláfjöll and their key stakeholders agree that the main environmental considerations in sustainable operation of the area should be to minimize impacts on water resources, landscapes, vegetation and visual aesthetics. The operators have, in particular over the past few years, sought consultation and collaboration with their stakeholders to comply with environmental, health, and safety regulatory requirements. In addition, they have fostered a relationship with the visitors and other users of the area, in order to meet their needs. The academic literature also highlights the importance of stakeholder involvement. The literature on sustainable tourism (Eber 1992; WTO 1993), protected areas and outdoor recreation (IUCN 2002; Manning 1999; Manning and More 2002), sustainable ski areas (Flagestad 2001; Gill 1991; Hudson 2000; NSAA 2000), and corporate environmentalism (Robbins 2003; Berry and Rondinelli 1998) suggests that stakeholders should play a key role in sustainable management of the study area.

Collaboration with stakeholder can benefit the operators of Bláfjöll in many ways. This includes:

- helping the operators to comply with environmental, safety and health regulatory requirements;
- providing an opportunity to develop strategies, beyond regulatory requirements, that protect and enhance environmental resources in the area;
- maximizing visitors' enjoyment;
- promoting sustainability in local communities;
- enlisting general support for the operation of the area; and,
- increasing economic viability by maximizing usage and collaboration with local businesses.

The Bláfjöll operators are addressing many of the environmental and social management concerns that are associated with the operation. However, in order to be managed in a sustainable fashion, the operators have to improve their performances in some areas. Moreover, they have to address those issues in a *systematic* and *integrated* way, because sustainability has environmental, social, and economic foundations that are interrelated and dependent on each other. The proposed SMS model provides such framework.

5.3 The ski area SMS model

This section introduces the SMS framework for Bláfjöll ski area and Country Park. It is suggested that Todd's (1994) EMS ski area model (see section 2.7.2) can be used to address the key themes in the sustainable management of the area. The key difference, however, between these two frameworks is the greater weight on stakeholder collaboration in the proposed SMS. Firstly, it is suggested that stakeholders should be involved in the management of the area early in the process. Failing to do this may result

in lost opportunities or create conflicts or problems that are difficult and expensive to solve. This could, in particular, be experienced during planning stages when decisions, that include irreversible environmental damages, are made. Secondly, stakeholder collaboration and consultation is a part of all the model's elements, and this perspective will be explained in more detail in the next section. The proposed SMS model has six elements and several related components. They are highlighted in Table 5.1.

Table 9. Elements and components of the ski area EMS model.

<i>EMS elements</i>	<i>Components</i>
Policy	<ul style="list-style-type: none"> • Purpose • Commitment • Policy statement
Stakeholder involvement	<ul style="list-style-type: none"> • Identifying stakeholders • Build long term relationship • Involvement • Evaluating and reporting
Planning	<ul style="list-style-type: none"> • Analysis • Objectives and targets • Implementation plan
Procedures and controls	<ul style="list-style-type: none"> • Organization • Performance measurement • Information management • Incident response
Training, education, and communication	<ul style="list-style-type: none"> • Staff training, education and communication • Strategic research • Visitor education
Assessment and Improvement	<ul style="list-style-type: none"> • System reviews • Audits • Follow-up

Source: adapted from Todd (1994).

5.3.1 Application of the model

The SMS model suggested here is an adapted version of Todd's (1994) environmental management system framework (EMS) and other EMS models discussed in the literature (Hunt and Johnson 1995; Todd and Williams 1996; Williams and Todd 1997). However, it adds a significant component related to other social and collaboration management dimensions.

5.3.1.1 Policy

The formation of a sustainability policy for the operators of Bláfjöll should be the first step in the SMS development. It is important to base the policy on the principles of sustainable tourism (e.g. Eber 1992; WTO 1993) and protected areas intended for outdoor recreation (e.g. IUCN 2002). It is suggested that the policy should be based on commitments to:

- comply fully with all environmental, health and safety regulatory requirements that apply to the area and the operation, but also to go beyond regulatory requirements and enhance those matters where possible;
- provide visitors with enjoyment and enhancing sustainability in local communities by focusing on sustainable interaction of people and nature;
- achieve its objectives through flexible, accountable, transparent and adaptive management strategies; and
- collaborate with and involve stakeholders in the operation and planning of the area.

Purpose

The SMS's purpose should include what needs to be done and also include why the operators believe in doing it. The purpose should also include how Bláfjöll's SMS practices will be improved as a result of installing this system.

Commitment

A key for a successful SMS is for senior management (Bláfjöll management board) to commit to adopting and implementing the SMS. This commitment must become part of the future culture of the operation. In addition, sufficient resources need to be allocated to sustainability initiatives. The operators of Bláfjöll are already implementing sustainability initiatives, and are willing to further improve their performance. However, their

commitment to aim at sustainable management needs to be stated more clearly and visibly practiced by all senior managers.

Policy statement

The purpose of a sustainability statement is to provide a definition for those within the Bláfjöll organization of what their common purpose is with regard to environmental, social, and economic matters. It should also provide a definition of the principles, priorities and intentions to be followed by the organization. It should be apparent to stakeholders within and beyond the organization. The statement should be brief, but clearly identify that sustainability practices within the company will be applied.

Furthermore, it should include a commitment to continuous improvement, which will make it easy to improve the statement in the future.

5.3.1.2 Stakeholder involvement

In this step, it is important to consider who the stakeholders of Bláfjöll are, and how they may contribute to the sustainable management of the area. Stakeholders can help identify and address negative impacts as well as identify new opportunities in the operation. The step has four stakeholder components (IUCN 2002).

1. Identifying and informing stakeholders

Bláfjöll's stakeholders were discussed in details in chapter 4 (section 4.4.3). Figure 10 summarizes how these stakeholders contribute to environmental, social and economic sustainability at the destination and within local communities. Identifying stakeholders should, however, be an on-going process; new stakeholders may be identified, or the role of the existing ones change, with potential regulatory changes and changes in the

operation of the area. This stakeholder analysis should focus on identifying stakeholders' interests in the operation of the area, their needs, expectations and sustainability opportunities. The operators of Bláfjöll should inform the stakeholders about their objectives and constraints.

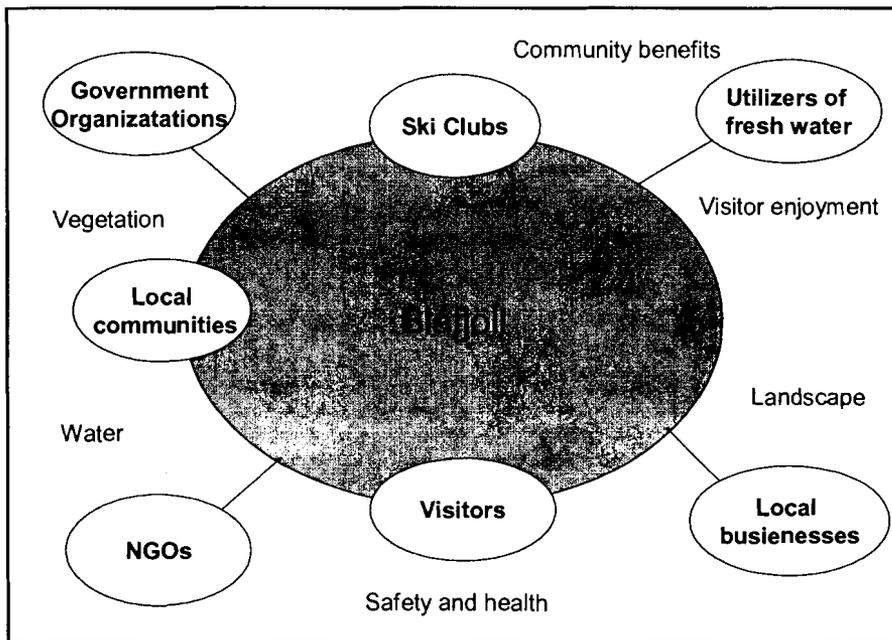


Figure 10. Bláfjöll's key stakeholders and their contribution to environmental, social, and economic sustainability.

2. Building up capacities of stakeholders and building long term relationships with them

This will be achieved by a discussion on how the stakeholders can contribute to sustainable management of the area. Discussion with stakeholders will also increase the trust between the parties which is critical for a successful relationship. The members of the Reykjavík Ski Areas management board are for example in a good position to explore and initiate discussion with stakeholders in their local communities.

3. Involving stakeholders in management

At this stage, the operators can develop sustainability initiatives in collaboration with their key stakeholders (Figure 10). Involvement means that the operators should take

stakeholders' perspectives into account in decision making. Problems should be solved by collaboration, rather than compromise, where involved parties actively seek a mutually determined solution.

Increased communication with government organizations responsible for environmental, health and safety matters in the area, can improve effectiveness of Bláfjöll's sustainability management strategies (see section 4.5.1). It is also an important part of due diligence for the operators. In addition, improved stakeholder collaboration may provide support for the operation, from the public, politicians, government organizations, NGOs and the private sector.

4. Evaluating stakeholder expectations and reporting

Finally, stakeholder expectations have to be evaluated and addressed, in order to improve the system. Upon being addressed, the results should be reported. Reporting may be regulatory requirement or voluntary. Benefits of voluntary environmental reporting include:

- better communication with stakeholders;
- enhanced confidence of stakeholders; and,
- strengthened support from stakeholders.

Reports need to be systemized and centralized. They should be made available to management and stakeholders in a timely manner. One approach to communicating them is to post them on Bláfjöll's website.

5.3.1.3 Planning

Analysis

The next step in the SMS framework is to determine which sustainability concerns need to be addressed. An environmental and social effect analysis as well as regulatory analysis will help to make informed decisions about which initiatives should be management priorities. These analyses will enable the Bláfjöll operators to answer the question, “where are we now” and “where should we be going” in terms of minimizing environmental impacts, maximizing social opportunities, and meeting regulatory requirements (Davies and Rusko 1993; Hunt and Johnson 1995). The analyses will also provide a basis for potentially revising Bláfjöll’s sustainability policy. The aim should be not only to learn from previous experiences - i.e. mistakes and problems, including abnormal and emergency situations – but also to identify opportunities to enhance the management practices of the operation.

Environmental effect analysis

Time and financial constraints will not allow environmental in-depth analysis of all effects. The analysis can, however, be improved over time. Several studies have been done to estimate environmental effects of the ski area and the Country Park (Línuhönnun 2000; Orion 2003; Torfason 2003). Ideally, the operators of Bláfjöll should seek for stakeholder collaboration and support. Exploiters of water resources could for example support analyses discussing effects on water resources, while the Environment and Food Agency could guide analysis looking at effects of visitors on geological formations and carrying capacity of the area.

Social analysis

A social analysis should focus on understanding three key aspects: community benefits, visitor enjoyment, and safety. Like in the environmental effect analysis, consultation with relevant stakeholders would be beneficiary. Currently, the Bláfjöll's operators conduct surveys in order to provide quality services for visitors and maximize on- and off-site benefits. In addition, they should consider to involve the public and other stakeholders more in future development of the area; for example by holding workshops or forums.

Regulatory analysis

In order to be able to comply with all regulatory requirements, the Bláfjöll's operators need to know of all requirements placed upon the operation by regulatory authorities as well as whether these requirements are being met. It may be challenging for the operators to comply with all requirements, given the number of environmental, health and safety legislations that can potentially relate to the area and the operation. The outcome of the regulatory analysis could be reviewed by appropriate stakeholders and should then be available and introduced to all management and other personnel.

Objectives and Target

Sustainability objectives are more detailed means of meeting the intent of the sustainability policy. They should include aspects of continuous improvement and define how much better the organization is going to be through addressing these objectives. They should also identify the expected time needed to achieve the objectives. The targets are the detailed performance requirements that the operators try to achieve. They should be simple and manageable at the initial stages. They should include indicators that allow for quantifiable measuring progress towards the objectives achievements. The targets

should also be based on the costs associated with different courses of action. Objectives and targets and relevant indicators should be developed in consultation with stakeholders who might have expertise in the area that is being addressed. Outcomes of such monitoring need to be communicated to stakeholders. The indicators could for example measure the number of oil spillages or the amount of oil lost in such spillages, the amount of waste (weight), the number of accidents on ski hills and lifts over a given period, reported off road driving incidents, or visitor satisfaction.

Implementation plan

Implementation plans outline the strategies that need to be taken in order to fulfil the SMS objectives. The plan should outline:

- What will be done?
- What alternatives exist to achieve the objectives?
- How will it be done (including funding requirements)?
- When will it be done?
- Who will be responsible?

The existing sustainability programs in Bláfjöll should become part of the implementation plan.

5.3.1.4 Procedures and control

Procedures refers to the ski area's expectations of how things should be done, while "controls refer to the system of organization and specific checks instituted by management to ensure that things are done according to expectations" (Todd 1994, 62).

These are further discussed below.

Organization

Organization includes assignment of responsibility and granting of authority for sustainability practices. Everybody involved in the operation of Bláfjöll can contribute to the achievement of the sustainability goals. This is not limited to the personnel and management, but should also apply to ski clubs and other parties working in the Country Park. All those stakeholders designated with accountability for sustainability performance should be clearly identified. The accountability component of an SMS can be made especially effective by:

- documenting and communicating key responsibilities (for example incorporate environmental responsibilities into job descriptions);
- creating separate budget lines for environmental initiatives; and,
- requiring regular reports on the achievement of environmental targets.

Supervision of accountability actors can be powerful for early detection and correction of environmental problems if staff are not following procedures. The ski area superintendent could for example be in a good position to conduct such supervision. It is also suggested that a sustainability team (including at least one person from the management board and one of the ski area personnel) should be established, to focus on ensuring the application of the SMS.

Performance measurement

Performance measurements determine whether sustainability targets are being met. It can for example include quantitative calculations, field or laboratory tests, inventories, and surveys (Davies and Rusko 1993). The SMS should include directions for data collection and measurements (e.g. how, when and by whom they are done). Ideally this should be controlled, or checked, by another individual. Currently, Reykjavik Energy and the

Health Monitoring Agency supervise environmental practices aimed at preventing leakage of polluting substances in to the groundwater. However, in order to have effective performance measurements, there is a need for clearer objectives and targets (e.g. amount of oil lost in spillages, amount of waste, visitor satisfaction etc.).

Information management

The Bláfjöll operators do not have the capacity to generate lengthy documents related to the SMS. However, documentation processes can improve with time. Information management should focus on making internal documentation effective. Also, it should focus on gathering and systematically reviewing external documents that concern the operation, as well as anticipated laws and regulations applying to it. Stakeholders, particularly government organizations, can help provide valuable information regarding the operation.

The creation of a manual of sustainability procedures is recommended to implement the SMS framework successfully. At a minimum, it should describe operational procedures related to implementing the SMS policy elements. Other issues that need to be documented include:

- the sustainability policy, objectives and targets;
- procedures for stakeholder involvement;
- methods for effect analysis;
- program of responsibilities assignments;
- an implementation and reviewing schedule;
- costs and resources allocated for implementing various components of the SMS;
- Bláfjöll's expectations and guidelines to staff and other stakeholders with respect to the practice of SMS policy; and
- performance measurements and past progress associated with SMS goals.

These subjects should be incorporated into existing documents where relevant, such as the ski area's management handbook or published on Bláfjöll's website. Providing stakeholders with opportunity to be involved in the reporting process, for example by reviewing documents, may result in better outcomes and enhance trust in the ski area's practices.

Incident response

Incident response deals with unanticipated events, such as fuel spills, earthquakes, avalanches, broken chair lift etc. Plans of how to address such situations have been prepared in some areas in the operation. Stakeholder support can be critical in incident responses, because Bláfjöll's operators do not always have the capacity themselves to take necessary actions in the case of unanticipated events. Furthermore, they can improve their practices by considering key aspects of successful incident response. These include:

- train personnel;
- react promptly to problems;
- notify authorities early;
- open discussion with stakeholders;
- testing for possible environmental effects; and,
- development of short and long term responses with the support of authorities.

5.3.1.5 Training and education

Staff training, education and communication

It is important that all personnel have the skills and understanding needed to achieve the sustainability goals. Training of Bláfjöll's personnel can be improved by including critical sustainable management roles and tasks in job descriptions, as well as by addressing sustainability issues in the staff's training and orientation course.

General training

General training should focus on training in multi-disciplinary skills (the natural environment, community participation, safety, technical issues etc.) (IUCN 2002). It should also discuss objectives and methods for helping to implement the SMS framework. Furthermore, all staff should be advised about the importance of compliance with the sustainability policy and objectives, and their role in achieving them, as well as the potential benefits of improved sustainability performance. General training should also address ways of improving visitor's enjoyment, as well as understanding and appreciation of the ski area's sustainability programs.

Special purpose training

Special purpose training should educate personnel about improvements in the part of the operation they are involved in. Those involved in vehicle operation need for example to be educated on how to reduce oil leaks, as well as gain an appreciation of consequences of such leakage. Those involved in the lift operation on the other hand, need training regarding lift safety, while potential guides and interpreters will need to have knowledge about the natural environment. The goal is to provide personnel with sufficient information so each person knows what he or she is expected to do and how to do it.

Internal communication

Internal communication makes the personnel feel a sense of "ownership" and responsibility for the SMS. Moreover, it can strengthen Bláfjöll's commitment to its sustainability policy, and help to make the SMS work as an integrated system. Bláfjöll can improve communication by:

- encouraging personnel regarding achieved targets;

- providing access to environmental information;
- encouraging two way communication, employees should have the opportunity to report problems and make positive suggestions; and,
- providing accurate and clear written procedures and work instructions for environment and safety critical activities (e.g. how to respond to oil leakage, such as hydraulic leakage from a snow cat when it is working on the ski hills, and how to drive snow mobiles or snow cats on the ski hills when visitors are skiing).

Strategic research

Bláfjöll's operators can undertake a research themselves, or in cooperation with their stakeholders. Such initiatives are important to understand environmental and social processes related to the area's operation. They also use this research to demonstrate to their stakeholders that they are aiming at improving the sustainability of the operation. Long term research can help to assess effects analysis findings. It can also feed into the components of staff training and visitor education. Urgent research areas would for example be related to ground water flow in the Water Conservation Area, impacts of visitors on water resources, location and types of lava caves in the area, and social- and environmental carrying capacity.

Visitor education

As a protected outdoor recreational area, one of the principle benefits of the SMS should be to create better knowledge and awareness of conservation of natural and cultural values among visitors and local people. Policies regarding public awareness and education should be based on the unique characteristics of the landscapes, and the link between nature and people (IUCN 2002). This could for example include providing visitors with information on geological formations and the history and location of historic trails in the area. Education should be designed to raise awareness, and a sense, of

responsibility towards the landscape. It could be delivered through a range of mechanism, including: face to face interpretation, sustainability and safety code for visitors; interpretive signs, the internet, and printed matter. Visitor education can help to build the support of visitors in meeting sustainability objectives and the SMS framework. Such education programs can also help to attract visitors to the area, and enhance their experiences. Moreover increased awareness can influence their behaviour, which is critical to minimize environmental impacts (in particular on water resources) and secure safety in the area.

5.3.1.6 Assessment and improvement

The SMS should, once established, contain mechanism for its own maintenance. It should also be flexible and subject to a degree of continuous revision at appropriate levels. It should feed back the lesson learnt into the management of the area, which should be adaptive (i.e. “learn by doing”) (IUCN 2002). Both implementation and outcomes should be monitored. Corrective action is required when there is a non-compliance (i.e. a failure in the planned operation of part of the SMS, or a failure to achieve an intended outcome). Corrective action has the objective of:

- restoring control as rapidly as possible;
- mitigating the consequences of the non-compliance; and,
- investing and identifying root causes, and taking steps to prevent a recurrence.

System reviews

Once the SMS has been functioning for some time (for example one or two ski seasons), a review of performances and the SMS effectiveness, for each of its elements, should be conducted. Responsibility should be assigned for corrective action, and a timetable

developed for implementation. System reviews are also an important part of due diligence. If something goes wrong in the operation, the operators are in much better position if they have a SMS in place, and procedures to ensure it is working properly. This is particularly important with regards to strategies aiming at conserving ground water sources in the area. A system review should both repair weaknesses and build on strengths. The SMS can thus be viewed as a sustainability internal control system which provides an opportunity for self-evaluation.

Audits

Independent audits (conducted by a party independent of Bláfjöll) should inform the operators and other stakeholder about whether specific regulatory requirements have been met. This audit can also be used to check whether internal targets have been achieved. Furthermore, it should examine the suitability of program components in the system to meeting stated purposes.

Follow-up

A follow-up plan of reviews and audits identifies existing weaknesses and the corrective action needed. This step is critical for continuous improvement.

5.3.1.7 Implementation

Implementation of the SMS should be guided by a plan to ensure integration with the existing management structure. It should address difficulties associated with the implementation, such as resistance to organizational change within current management, and justification of environmental expenditures (Todd and Williams 1997). Again, it is very important to have a commitment of senior management. In addition, it is critical to

have someone within the company to oversee the SMS, and make sure all employees are committed to making the system work.

Most costs are associated with the SMS during initial implementation. However, as previously noted, there is no need for a sophisticated SMS immediately, because this is a self assessment and self improvement framework. It might become difficult to initially justify the costs associated with the intangible benefits of the SMS. It is thus important to inform the shareholders (the local communities) about those benefits, prior to putting before decision makers. The sooner the operators of Bláfjöll adopt the system, the sooner they will receive the benefits it generates.

CHAPTER 6: CONCLUSIONS

This chapter presents the major conclusions for this study and provides recommendations for further research.

6.1 Summary of conclusions

The goals of this study were to identify the key components of a SMS for ski areas, and to develop a workable SMS for Bláfjöll ski area.

Key ski area management concerns

A SMS needs to include environmental, social and economic considerations among its objectives. The literature provides a good description of environmental impacts associated with ski area operation. Moreover, it provides frameworks to address those issues systematically. The key ski area environmental management concerns include:

- scenic beauty of the ski area;
- water quality;
- solid waste management;
- adequacy of sewage facilities;
- water consumption;
- health of local ecosystems;
- soil and vegetation protection;
- air quality;
- noise levels;
- energy consumptions;
- fuel and chemical handling; and
- protection of wildlife populations.

The literature on social ski area management concerns focuses mainly on growth problems and issues related to resort communities. Following are key social issues identified in the ski area and the tourism literature:

- the lack of community services and facilities;
- migration in to and out of communities;
- escalation in prices of goods and services and increased taxation;
- loss of cultural identity and character of place;
- homogeneity of employment;
- increased traffic and level of crimes;
- lack of affordable housing (for employees);
- seasonality problems;
- economic leakage from the community; and,
- sourcing of goods and services.

The ski area literature does not, however, provide good information on issues that go beyond community impacts. The guiding principle for sustainable tourism development is to “manage the natural and human resources so as to maximise visitor enjoyment and local benefit while minimizing negative impacts upon the destination site, community and local population” (WTO 1993, 107). Consequently, a ski area SMS should also address broader community benefits that are potentially associated with ski area operation, as well as visitor enjoyment. Safety should also be included in a SMS, because safety has been identified as a critical component of sustainable development. Principles for managing outdoor recreation and protected areas suggest that ski areas can contribute to quality of life in local communities. In order to do so it is critical to involve these communities in operation and planning. The focus should particularly be on the link between people and nature. That link can for example be provided through educational programs that increase

sustainability awareness. Communication with visitors can also help to meet needs of visitors. Each ski area has its own social and environmental setting and characteristics. One of the strengths of the proposed SMS framework is its adaptability to different settings. Stakeholder collaboration is critical in this regard. Stakeholders with a specific knowledge or an interest in the operation can help identifying sustainability issues as well as helping to address them successfully. Furthermore, stakeholder collaboration is critical to solve potential conflicts with stakeholder groups, as well as for enlisting a support for the operation.

SMS for Bláfjöll

The ski area in Bláfjöll is located within a Country Park and a Water Conservation Area. Consequently, three key mandates associated with the operation include:

- to provide residents in local communities with outdoor recreational opportunities;
- protect landscapes within the Country Park; and,
- conserve fresh water resources within the Water Conservation Area.

The Bláfjöll's operators and their stakeholders perceive conservation of fresh water in the area to be the most important sustainability issue in the operation. They also viewed negative impacts on landscapes and vegetation, as well as visual aesthetics, to be important issues in the operation. Currently there are measures in place, developed in cooperation with key stakeholders, aimed at protecting water resources from activities in the area. Other environmental practices are, however, not very systematic.

Community benefits are very important outcomes associated with the operation of the ski area and the Country Park. The operators have developed a vision to improve the operation. The vision includes improving the viability, safety, environmental practices, and visitor services. Recently, the operators have focused on maintaining and establishing

a relationship with their stakeholders - including visitors, ski clubs, and environmental agencies - in order to implement the objectives outlined in the vision. The proposed SMS would help identify and address Bláfjöll's key sustainability issues in a systematic way, with clear objectives and strategies to implement the proposed practices. This is very critical, because environmental, economic and social dimensions of sustainability are interrelated and dependent on each other. The framework should not only focus on complying with regulatory requirements. It should also focus on opportunities that can contribute to sustainability in the area. The SMS can be viewed as a tool to protect water resources in the area, and minimize other environmental impacts. It can also help to maximize visitor enjoyment and improve quality of life in the local communities. As a result the framework helps to enlist a support for future operation of the area.

Following is a summary of key recommendations for implementing the proposed SMS for Bláfjöll successfully:

Improving collaborative relationship with environment, health and safety government organizations:

Bláfjöll's operators should view collaboration with these parties as an opportunity to:

- help identify sustainability management concerns;
- improve sustainability management practices, because the organizations have a knowledge in many areas that the operators do not have;
- understand existing regulations and laws that apply to the area; and,
- communicate long term planning effectively.

Strengthening collaborative relationship with local communities.

The goal is to introduce and motivate people, especially children and youth, to use the area and receive the physical and psychological benefits it can offer.

Sustainability and natural education programs could for example be offered to elementary schools and organizations involved in social and community development. Management board members could be the key people to establish such relationships in their local communities.

Strengthening collaborative relationship with NGOs.

NGOs often have a knowledge about specific issues in the area or regarding the operation. Outdoor recreation and travel societies could for example help with planning of more diverse and sustainable outdoor recreation in the area. Enhanced relationship with environmental NGOs may also enlist support with the operation.

Enhancing visitor education.

This should include providing better knowledge about conservation, and raise awareness of, natural and cultural values among visitors and local people. This should be based on the unique characteristics of the area and the link between nature and people (e.g. utilization and conservation of fresh water sources, geological formations, or history of the area). Education should be used to improve public practices and behaviour in the area.

Improving the education of personnel.

Bláfjöll's operators should provide general training in multi-disciplinary skills and also special purpose training. The success of sustainability management programs depends on well trained and informed personnel. General training should focus on multi-disciplinary skills (natural environment, safety, and technical issues). Special purpose training should improve specific critical practices. Education of personnel can be improved by including critical management roles and tasks in job descriptions and by addressing sustainability issues in staff's training course.

Focusing more on issues and problems in the Country Park (outside the ski area).

The operators of Bláfjöll have a mandate to manage the whole Country Park, not only the ski area. There is a need for improved facilities in the area as well as information in order to prevent negative environmental impacts in some areas of the Park. Visitors might also have to be guided to specific places, in order to prevent environmental damage and improve visitor enjoyment. This will be more critical with increased usage of the area, particularly during summers. Objectives in future development of the area should be achieved through flexible, accountable, transparent and adaptive management strategies.

Undertaking and encouraging research in the area.

More information is needed in some areas, for example on ground water flow, social and environmental carrying capacity, and location and types of lava caves. Cooperation should be sought from stakeholders with interests in these issues, to participate in and fund such research (for example exploiters of fresh water in the Water Conservation Area, and organizations responsible for environmental conservation and protection in the area).

Improving solid waste management and reduce energy use.

The ski area uses large amount of water and energy. It also creates a large amount of solid waste. Recycling, energy conservation, and water conservation programs should be implemented in order to minimize the indirect impacts resulting from those issues. Such programs should be made visible to visitors and thus have an education value for them.

6.2 Areas for future research

This study raises several possibilities for future research:

- Bláfjöll's key stakeholders were interviewed in this research. However, this research did not survey visitors of the area. Such survey research could focus on

determining what visitors perceive to be the key sustainability issues in the area and how they can be addressed. It could for example provide information on how the visitors may want to be involved in the management of the area and in supporting the SMS.

- The SMS literature is not very comprehensive. For example it does not provide a definition of the SMS concept. It is suggested here that a SMS provide a framework for organizations to manage their environmental, social and economic performance in a continuing and systematic manner. A SMS should go beyond regulatory requirement, aiming at improving quality of life, and be supported by key stakeholders. It would be valuable to look into the more recent EMS literature and use it to more fully define and describe the SMS concept.
- There is a need for more research on social issues associated with ski area operations. This research should go beyond problems and issues in the context of resort communities. Such research could include exploring various dimensions of visitor enjoyment, visitor management, educational programs, health and safety matters, and other broader community benefits of ski area operations. The literature on outdoor recreation provides information in this area (e.g. Ap and Crompton 1998).
- Destinations have different environmental and social settings. This case study included a ski area that has the mandate to provide outdoor recreation, but at the same time protect landscapes and fresh water resources. It is also different from other ski areas because it is owned and operated by local communities. It would

be interesting to see whether the framework is applicable to typical North American and European resorts.

- A SMS could be developed and tested in other areas of tourism operations. It might also be a suitable tool in the management of protected areas, where social and environmental considerations are both essential in the operation.

APPENDIX A: ETHICS APPROVAL
SIMON FRASER UNIVERSITY

OFFICE OF RESEARCH ETHICS



BURNABY, BRITISH COLUMBIA
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Telephone: 604-291-3447
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August 13, 2003

Mr. Gunner Eydal
Graduate Student
School of Resource and
Environmental Management
Simon Fraser University

Dear Mr. Eydal:

**Re: The development of a sustainability management system
for ski areas**

The above-titled ethics application has been granted approval by the Simon Fraser Research Ethics Board, at its meeting on July 28, 2003 in accordance with Policy R 20.01, "Ethics Review of Research Involving Human Subjects".

Sincerely,

Dr. Hal Weinberg, Director
Office of Research Ethics

APPENDIX B: POTENTIAL ENVIRONMENTAL EFFECTS OF SKI AREA DEVELOPMENT AND OPERATION.

Activity	Pollution	Physical Processes	Biological Systems
Construction			
<i>Run clearing or road/bridge building</i>	<p>Toxins (e.g. fuel and oil) released into terrestrial and aquatic environments.</p> <p>Particulate contamination from burning slash/stumps.</p> <p>Sedimentation of aquatic environment.</p> <p>Vehicle/generator emissions.</p> <p>Construction waste, litter.</p> <p>Visual effects.</p> <p>Machine noise.</p>	<p>Alteration of surface and groundwater flows/patterns.</p> <p>Terrain modification</p> <p>Slumping.</p> <p>Soil erosion and compaction.</p>	<p>Flora disturbed or destroyed.</p> <p>Habitat loss.</p> <p>Barriers to wildlife movement.</p>
<i>Lift building</i>	<p>Toxins (e.g. fuel and oil) released into terrestrial and aquatic environments.</p> <p>Sedimentation of aquatic environment.</p> <p>Vehicle/generator emissions.</p> <p>Machine noise.</p> <p>Construction waste, litter.</p> <p>Visual impacts.</p>	<p>Alteration of surface water patterns.</p> <p>Compaction, erosion of soils.</p> <p>Topsoil loss or mixture with excavated soils.</p>	<p>Flora disturbed or destroyed.</p> <p>Habitat loss.</p> <p>Barriers to wildlife movement.</p>
<i>Snowmaking installation</i>	<p>Toxins (e.g. fuel and oil) released into terrestrial and aquatic environments.</p> <p>Sedimentation of aquatic environment.</p> <p>Vehicle/generator emissions.</p> <p>Construction waste, litter.</p> <p>Machine noise.</p> <p>Visual impacts.</p>	<p>Erosion.</p> <p>Slumping.</p> <p>Topsoil loss.</p> <p>Alteration of surface and ground water flows/patterns.</p> <p>Diversion or impoundment of water courses.</p> <p>Reservoir flood risk.</p>	<p>Flora and fauna disturbed, particularly fish.</p>

Activity	Pollution	Physical Processes	Biological Systems
<i>Hotel and real estate construction</i>	Toxins (e.g. fuel and oil) released into terrestrial and aquatic environments. Sedimentation of aquatic environment. Vehicle/generator emissions. Installation of CFC containing equipment. Construction waste, litter. Machine noise. Visual impact.	Alteration of drainage. Terrain modification. Slumping. Erosion.	Loss of wetland functions. Flora disturbed or destroyed. Habitat loss. Barriers to wildlife movement. Non-native flora introduced.
<i>Parking Lot Construction</i>	Toxins (e.g. fuel and oil) released into terrestrial and aquatic environments. Sedimentation of aquatic environment. Vehicle/generator emissions. Machine noise. Visual impact. Construction waste, litter.	Alteration of surface and ground water flows/patterns. Terrain modification. Erosion. Slumping.	Loss of wetland functions. Flora disturbed or destroyed. Habitat loss. Barriers to wildlife movement.
Operations			
<i>Skiing</i>	Litter.	Redistribution and compacting of snow. Soil erosion if snow cover is thin.	Damage to flora if snow cover is thin. Damage to small trees. Wildlife disturbance.
<i>Lift operations</i>	Contamination from diesel generator leaks. Lift motor emissions. Hazardous wastes from lift maintenance. Noise. Litter.		Lift lines can act as barrier to wildlife.
<i>Snow making and snow hardening</i>	Introduction of biological snow hardening agents. Machine oil/fuel contamination. Noise.	Alteration of surface water flows. Alteration of snow melt regimes.	Wildlife disturbance.

Activity	Pollution	Physical Processes	Biological Systems
<i>Grooming</i>	Pollution from machine oil/fuel. Vehicle emissions.	Soil erosion if snow cover is thin.	Damage to trees. Wildlife disturbance.
<i>Hiking or off road biking.</i>	Bacterial contamination at campsites. Human wastes. Litter.	Localized erosion and soil compaction.	Trampling of flora. Wildlife disturbance.
<i>Accommodation/ Food service/retail/ administration</i>	Pollution from sewage disposal. Solid waste. Energy consumption. Litter.		Contamination of terrestrial and aquatic environments with liquid/solid wastes.
<i>Building maintenance</i>	Contamination from stored paints, solvents. Construction and hazardous waste. Noise.		
<i>Transportation of guests and goods</i>	Vehicle emissions. Oil and salt contamination from road and parking lot run-off. Litter. Traffic noise.	Compaction and erosion on unsealed roads.	Road kills. Barriers to wildlife. Non-native species introduced.

Source: adapted from Wilde (1998).

APPENDIX C: INTERVIEWED PARTIES

Information from the operators of Bláfjöll

Individual	Position
<i>Personal interviews</i>	
Hermannsson, Ingi Þór 2003.	A member of Reykjavík Ski Areas management board. A representative for the municipality of Kópavogur.
Hjaltason, Þorsteinn 2003.	Bláfjöll Country Park superintendent.
Jónsdóttir, Hildur 2003.	A member of Reykjavík Ski Areas management board. A representative for the municipality of Seltjarnarnes
Sigurfinnsson, Logi 2003.	Director of Reykjavík Ski Areas.
Sverrisson, Ingvar 2003	The Chair Reykjavík Ski Areas management board. A representative for the municipality of Reykjavík.
Þórisson, Grétar Hallur 2003.	Bláfjöll ski area superintendent.
<i>Self administered questions</i>	
Pálsson, Hlynur Skagfjörð 2003.	Supervisor of daily outdoor practices in the ski area.

Information from Bláfjöll's stakeholders

Individual	Organization and position	Link to the ski area
<i>Personal interviews</i>		
Sigurðsson, Haraldur 2003.	Árman Ski Club. A member of the ski club management.	The ski club operates and owns several facilities in the ski area.
Björnsson, Guðmundur 2003.	Breiðablik Ski Club. A member of the ski club management.	The ski club operates and owns several facilities in the ski area.
Bragason, Árni 2003.	The Environment and Food Agency. Director of the division of Nature Conservation.	The agency is responsible for the management of protected areas in Iceland.
Gissurarson, Loftur 2003.	Reykjavík Energy. Quality Manager.	Reykjavík Energy is a company owned by local municipalities and, among else, operates waterworks for the Greater Reykjavík area.
Hrafinkelsson, Óttarr 2003.	The Sports and Youth council. Employed half time to develop programs and initiatives for youth in cooperation with the operators of Bláfjöll.	Former operators of the ski area and the Country Park.
Sörheller, Stefanía 2003.	Social Services Reykjavík. Project manager in the division of social development.	The agency provides social counselling and support for individuals and families.
Stefánsson, Páll 2003.	The Health Monitoring Agency of Hafnarfjörður and Kópavogur Area. An Environmental and health official.	The Agency is responsible for the supervision of environmental and health matters in the ski area.

Individual	Organization and position	Link to the ski area
<i>Personal interviews</i>		
Þorvarðardóttir, Guðríður and Friðriksdóttir, Sigurrós 2003.	The Environment and Food Agency. Employees of the division of Nature Conservation and the division of Environmental Supervision.	The agency is responsible for the management of protected areas.
<i>Self administered questions</i>		
Jónsson, Árni 2004.	Orion Ráðgjöf Managing Director.	A consulting company which works with Bláfjöll's operators on several projects.
Jónsson, Björn Guðbrandur 2004.	Gróður Fyrir Fólki Landnámi Ingólfs. A manager.	A non governmental organization, which aims at re-vegetating land in the Reykjavík area. The organization and the operators of Bláfjöll are working together on a re-vegetation project in Bláfjöll.
Jónsson, Sigurður Sveinn 2003.	The Icelandic Speleological Society. Chair of the society.	The society aims at exploring and conserving caves in Iceland.

APPENDIX D: INTERVIEW GUIDING QUESTIONS

1. Questions for Reykjavik Ski Areas (RSA).

Management and resources

- What are the main motivations for operating the ski area and the Country Park?
- What are RSA's management goals?
- What are the ski area's main strengths and weaknesses in order to achieve these goals?
- What are the resort's most valuable resources and what do the operators do to create, hold, protect, and enhance those resources?
- Does the company have an environmental/sustainability policy? What is the rationale for the policy?
- What do you think are the most significant environmental impacts and management concerns associated with the ski area and Country Park operation?
 - a) In operation
 - b) During construction?
- Are any informal or formal practices implemented to address those issues?
- Is RSA developing and/or implementing any other sustainability management programs? Why, and how important and successful are these programs (for the operation and for the communities)? How does the ski area and the communities benefit through them?
- Is RSA experiencing pressures to implement sustainability management practices in the operation of the area? From whom?
- To what extent are the area's environmental management concerns integrated with marketing policies and practices?
- Is the area experiencing strong competition, in terms of attracting visitors, from other destinations? Which?
- What parties or individuals have the greatest influence on the resort's development?

Stakeholders

- Who are RSA's key stakeholders (stakeholder is defined as any group or individual who can affect or is affected by the ski area)?
- How are you collaborating with and responding to their needs (including private businesses and outdoor recreation clubs)?
- How does RSA benefit through collaborative stakeholder relationship?
- How important are these stakeholders to RSA?
- Are there any conflicts between RSA and their stakeholders? For example, while they are using the facilities of the ski area, or regarding land use and planning of the area.

- Does RSA have a stakeholder strategy as a part of the corporate strategic plan?
- Are the stakeholders involved in the decision making process of the area (in planning as well as operation of the area)? How? Should they be more involved in the decision making?
- Which stakeholders would you be interested in enhancing collaborative relationship with? Why and how?
- How is RSA communicating with the public, the staff, and other stakeholders about their sustainability initiatives?
- What can you tell me about the relationship between ski clubs in the area and RSA? Are they included in the decision making process of the ski area? How? How would you describe the relationship with them? Good, bad,...

Other social issues

- How important is the area to local communities? What roles does it play in those communities today, and in the future?
- How do local communities benefit through the area? How does the area contribute to the quality of life in the communities? Do people benefit equally, or are some groups excluded from using the area for some reasons?
- Are there any negative social impacts associated with the operation of the area?
- Who are the main visitor groups of the ski area and the Country Park? (age, gender, what activities do they participate in, etc.)
- What is the main motivation for people to visit the destination (for example, wilderness experience, ski facilities, hiking opportunities etc.)?
- Which visitor groups are the most important as users of the area?
- Who do you target as potential customers, when marketing? Why, and how do you marketing?
- Is there a conflict between visitors in the area? If yes, between which groups? How are those issues managed today?
- What are your main concerns regarding safety in the area? How are those issues addressed today?

2. Questions for environmental government organizations.

- What are the most valuable or unique social and natural resources in Bláfjöll? Why are they unique?
- Are they threatened by the operation of the ski area and the Country Park? How?
- Who owns these resources and how should they be managed?
- Who are the stakeholders of the ski area (stakeholder is defined as any group or individual who can affect or is affected by the ski area)?
- What is (or should be) the destination's long-term goal?
 - a) In terms of nature conservation?
 - b) Socially (for example, what groups should it try to attract, and what activities should be offered)?

- What are the most significant environmental impacts associated with operation and construction of the area?
- Do you think the ski area has any negative social impacts on local communities? Which?
- How many visitors do you think the ski area and the Country Park can sustain (i.e. what is the ecological and social carrying capacity). For example skiers per day, skiers at any one time)?
- How important is the area for local communities, and how do they benefit from it (for example, physiological, psychological, and environmental benefits)?
- Do you think the ski area can somehow increase social sustainability in local communities? How?
- How does your organization cooperate and interact with RSA?
- Do you see an opportunity to improve this relationship?
- Do you think there is a potential for environmental education through the area? How?

3. Questions for community development agencies.

- How important is the area to local communities? What role does it play in those communities today? What role should it play in the future?
- How do local communities benefit from the area? How does the area contribute to the quality of life in the communities? Do people benefit equally, or are some groups in the society excluded from using the ski area for some reasons?
- Who are RSA's key stakeholders (stakeholder is defined as any group or individual who can affect or is affected by the ski area)?
- Is your organization somehow working or cooperating with RSA? For example by offering outdoor recreational-, cultural- or environmental- or other educational programs? If yes, has the initiative been successful? If no, do you think it could be successful? How?
- Do you think building a stronger relationship with RSA would help them with achieving their goals?
- Do you think collaboration with other governmental agencies could help the ski area in achieving its goal? Which agencies?
- Do you think there are any negative social impacts associated with the ski area operation?
- What management practices could be taken in order to maximise community benefits?
- Can you list priority community user groups of the ski area? Why are they important?

4. Questions for NGOs.

- What is the name of the club/association?
- What are the club's/association's goals?
- What activities are the members engaged in?
- Does the club have any organised activities in the area?

- How often do you think the club/association members use the ski area for outdoor recreation?
- What are the most valuable or unique social and natural resources in Bláfjöll
- How do the members of the club/association benefit from the area?
- Is the club/association working or cooperating with RSA? How?
- Do you think collaborative relationship between the club/association and RSA is important to the club/association?
- Can RSA benefit through such collaboration? How?
- What strategies could take place in order to satisfy club/association members and improve the collaborative relationship with RSA?
- How important is the ski area to the club/association?
- What resources of the ski area does the club/association value most?
- Are the club/association members satisfied with the services and facilities offered in the area?
- Do you think the ski area and the Country Park could be improved? How?
- Do the club/association members have an easy access to the ski area?
- What are the club's/association's major constraints in terms of using the area?
- Are you aware of other clubs/associations with interests in the area?
- Does your club/association have an environmental policy or charter?
- Should it have some concerns about sustainable management of the area?

REFERENCE LIST

- Abbott, R. (1992). "Meeting the Environmental Challenge With a Systems Approach." *The Mining Letter* 9 (2).
- Ap, J. and J.L. Crompton (1998). "Developing and Testing a Tourism Impact Scale." *Journal of Travel Research* 37: 130-138.
- Anderson, D. H., R. Nickerson, T.V. Stein, and M.E. Lee (2000). "Planning to Provide Community and Visitor Benefits for Public Lands." in *Trends in Outdoor Recreation, Leisure and Tourism*, edited by W.C. Cartner and D.W. Lime. New York: CABI Publishers.
- Andriof, J. and S. Waddock (2002). "Unfolding Stakeholder Engagement." in *Unfolding Stakeholder Thinking: Theory, Responsibility and Engagement*, edited by J. Andriof, S. Waddock, B. Husted, and S. Rahman. Sheffield, UK: Greenleaf Publishing.
- Babbie, E. (1999). *The Basics of Social Research*. Belmont: Wadsworth Publishing Company.
- Bakker, M., Y. Bulych, D. Hansen, M. Korelec, K. Mahutova, V. Melnyk, and V. Morenko (2001). "Sustainable Development of Ski-Areas in the Alps." EPCEM Project Report. Amsterdam: University of Amsterdam.
- BC Heli and Snowcat Skiing Operators Association (2003). "Stewardship of Mountain Ecosystems: Best Practices for Sustainability (DRAFT)." British Columbia: The BC Heli and Snowcat Skiing Operators Association.
- Beaudry, M. (1991). "The Limits to Mountain Resort Growth." *Ski Area Management* 30: 39-63.
- Beeler, T. and J. Wood (1990). "Overcoming Environmental Obstacles." *Ski Area Management* 29: 74-78.
- Bendell, J. (2003). "Talking for Change? Reflections on Effective Stakeholder Dialogue." Pp. 53-69 in *Unfolding Stakeholder Thinking 2: Relationships, Communication, Reporting and Performance*, edited by J. Andriof, S. Waddock, B. Husted, and S. S. Rahman. Sheffield, UK: Greenleaf Publishing.
- Beresford, M. and A. Phillips (2000). "Protected Landscapes: a Conservation Model for the 21st century." *The George Wright Forum* 17 (1): 15-26.

- Berry, M.A. and D.A. Rondinelli (1998). "Proactive Corporate Environmental Management: A New Industrial Revolution." *Academy of Management Executive* 12: 38-50.
- British Columbia Round Table on the Environment and the Economy (1993). *Strategic Directions for Community Sustainability*. Victoria: Round Table on the Environment and the Economy.
- Brown, B.J., M.E. Hanson, D.M. Liverman, and R.W. Meredith (1987). "Global Sustainability: Toward Definition". *Environmental Management* 11: 713-719.
- Bruns, D., B.L. Driver, M.E. Lee, D.H. Anderson, and P.J. Brown (1994). "Pilot Tests for Implementing Benefits-Based Management." Paper Presented at The Fifth International Symposium on Society and Resource Management in Fort Collins, Colorado.
- BSI (1992). *BS 7750: Specification for Environmental Management Systems*. London: British Standard Institute.
- Burns, S. (2000). "Designing a Sustainability Management System Using the Natural Step Framework." Pp 342-357 in *ISO 14001: Case Studies and Practical Experiences*, edited by R. Hillary Sheffield, UK: Greenleaf Publishing.
- Butler, R. (2000). "Mapping Tourist Pressure: Discussion, Development and Examples." *The Tourist Review* 3: 2-7.
- CBSR (2001). "Socially and Environmentally Responsible Business Practices in British Columbia: Opportunities and Realities." Vancouver: Canadian Business for Social Responsibility.
- Clarkson, M., M. Starik, P. Cochran, and T.M. Jones (1994). "The Toronto Conference: Reflections on Stakeholder Theory." *Business and Society* 33: 82-131.
- CNN (2000). "Green Groups Grade Ski Areas." *CNN News Network* December 1. <http://www.cnn.com/2000/NATURE/12/01/ski.resorts.enr/>. Accessed June 25, 2003.
- Cockerell, N. (1994). "Market Segments. The International Ski Market in Europe." *Travel and Tourism Analyst* 3: 34-55.
- CORE (1995). "British Columbia's Strategy for Sustainability. Report to the Legislative Assembly 1994-95." Victoria: Commission on Resource and Environment.

- Crandall, L. (1994). "The Social Impact of Tourism on Developing Regions, and its Measurements." Pp. 413-424 in *Travel, Tourism and Hospitality Research: a Handbook for Managers and Researchers, Second Edition*, edited by J.R.B. Ritchie and C.R. Goeldner. New York: John Wiley & Sons.
- Crompton, J.L. and S.L. Richardson (1986). "The Tourism Connection where Public and Private Leisure Services Merge." *Parks and Recreation* October: 38-44, 67.
- CSA (1993). *Canadian Standards Association Z750: Guideline for a Voluntary Environmental Management System. Discussion Draft, Revision 8.0, November*. Rexdale: Canadian Standard Association.
- Culbertson, K., S. Jackson, and J. Kolberg (1991). "Loving the Mountains to Death: Toward a Definition of Sustainable Development in the Roaring Fork Valley of Colorado." Pp. 41-49 in *Mountain Resort Development: Proceedings of the Vail Conference, Colorado, April 18-21, 1991*, edited by A. Gill and R. Hartmann. Burnaby: Centre for Tourism Policy and Research, Simon Fraser University.
- Davies, C. and R. Rusko (1993). "Environmental Management Systems." Presentation to KPMG Executive Breakfast Seminar, 9 December, Vancouver.
- Davis, K. (1973). "The Case For and Against Business Assumption of Social Responsibilities." *Academy of Management Review* 22 (I).
- Dearden, P. and R. Rollins (2002). "The Times They Are Still A-Changin'." Pp. 3-19 in *Parks and Protected Areas in Canada: Planning and Management, Second Edition*, edited by P. Dearden and R. Rollins. Ontario: Oxford University Press.
- Donaldson, T. and L.E. Preston (1995). "The Stakeholder Theory of the Corporation: Concepts, Evidence and Implications." *Academy of Management Review* 20: 65-91.
- Driscoll, C. (1996). "Fostering Constructive Conflict Management in a Multi-Stakeholder Context: The Case of the Forest Round Table on Sustainable Development." *International Journal of Conflict Management* 7: 156-72.
- Driver, B.L., P.J. Brown, and G.L. Peterson (eds) (1991). *Benefits of Leisure*. Pennsylvania: Venture Publishing.
- Eber, S. (1992). "Beyond the Green Horizon: A Discussion Paper on Principles of Sustainable Tourism." Surrey: Tourism Concern and World Wide Fund for Nature.

- Einarsson, T. (1985). "Bláfjöll." Bls. 37-62 í *Árbók Ferðafélags Íslands 1985: Þættir um nágrenni Reykjavíkur*, ritstjóri Þorleifur Jónsson. Reykjavík: Ferðafélag Íslands. *Engl.*: "Bláfjöll" Pp. 37-62 in *Yearbook of the Iceland Touring Association, 1985*, edited by Þ. Jónsson. Reykjavík: The Iceland Touring Association.
- Federspiel, G. (1991). "Maintaining Small Town Character in a Modern Resort Community." Pp. 100-103 in *Mountain Resort Development: Proceedings of the Vail Conference, Colorado, April 18-21, 1991*, edited by A. Gill and R. Hartmann. Burnaby: Centre for Tourism Policy and Research, Simon Fraser University.
- Flagestad, A. (2001). *Strategic Success in Organisational Structure in Winter Sports Destinations. A Multiple Stakeholder Approach to Measuring Organisational Performance in Scandinavian and Swiss Case Study*. Bradford: Bradford University School of Management.
- Flagestad, A. and C. A. Hope (2001). "Strategic Success in Winter Sports Destination: a Sustainable Value Creation Perspective." *Tourism Management* 22: 445-461.
- Fraser Basin Management Program; Georgia Basin Initiative/Ministry of Municipal Affairs; Ministry of Small Business, Tourism and Culture; Province of B.C. Urban Salmon Habitat Program; The Real Estate Foundation (1995). "Navigating for Sustainability. A Guide for Local Decision Makers." British Columbia: Fraser Basin Management Program and Georgia Basin Initiative.
- Freeman, R.E. (1984). *Strategic Management: A stakeholder Approach*. Boston: Pitman Publishing Company.
- Frooman, J. 1999. "Stakeholder Influence Strategies." *Academy of Management Review* 24: 191-205.
- Fry, J. (1995). "Exactly What are Their Environmental Attitudes?" *Ski Area Management* 34: 45-70.
- Geoghegan, T. and Y. Renard (2002). "Beyond Community Involvement in Protected Area Planning and Management: Lessons from the Insula Caribbean." *Parks* 12 (2). Gland, Switzerland: IUCN.
- Gill, A. (1991). "Issues and Problems of Community Development in Whistler, British Columbia." Pp. 27-31 in *Mountain Resort Development: Proceedings of the Vail Conference, Colorado, April 18-21, 1991*, edited by A. Gill and R. Hartmann. Burnaby: Centre for Tourism Policy and Research, Simon Fraser University.

- Goeldner, C. (1996). "North American Alpine Tourism Development: Competition, Obstacles, Strategies, Consequences." *Studies in Tourism and Service Industry* 3 (1/2): 136-154.
- Gray, B. (1989). *Collaborating: Finding Common Ground for Multiparty Problems*. San Francisco: Jossey-Bass.
- Gunton, T.I., J.C. Day and P. Williams (guest eds) 2003. "The Role of Collaborative Planning in Environmental Management: The North American Experience." *Environments* 31 (2), 1-4.
- Hall, C.M., and S.J. Page (1999). *The Geography of Tourism and Recreation: Environment, Place and Space*. London and New York: Routledge.
- Hansen, B. (2000). "Ski Areas Graded on Environmental Practices." *The LYCOS Network*, November 30. <http://ens.lycos.com/nov2000/2000L-11-30-06.html>. Accessed June 27, 2001.
- Harabaugh, J.A. (1997). "Ski industry consolidation or financing 90s Style?" *Ski Area Management* 36: 51-2 and 74.
- Harris, R., T. Griffin, and P. Williams (eds) (2002). *Sustainable Tourism: A global perspective*. New York: Butterworth Heinemann.
- Hart, M. (1995). *Guide to Sustainable Community Indicators*. Ipswich, Massachusetts: QLF/Atlantic Centre for the Environment.
- Holden, A. (1998). "The Use of Visitor Understanding in Skiing Management and Development Decisions at the Cairngorm Mountains, Scotland." *Tourism Management* 19: 145-152.
- Holden, A. (1999). "High Impact Tourism: A Suitable Component of Sustainable Policy? The Case of Downhill Skiing Development at Cairngorm, Scotland." *Journal of Sustainable Tourism* 7: 97-107.
- Hörnsten, L. (2000). *Outdoor Recreation in Swedish Forests: Implications for Society and Forestry*. Uppsala: Department of Forest Management and Products and Swedish University of Agricultural Sciences.
- Hudson, S. (1995). "Responsible Tourism: a Model for the Greening of Alpine Ski Resorts." Pp. 239-255 in *Policy and Politics in Sport, Education and Leisure*, edited by S. Fleming, M. Talbot, and A. Tomlinson. Brighton: LSA Publications.
- Hudson, S. (2000). *Snow Business: A Story of the International Industry*. London: Cassell.

- Hunt, D. and C. Johnson. (1995). *Environmental Management Systems. Principles and Practice*. London: McGraw-Hill Book Company.
- ICC (1989). *Environmental Auditing. Publication No. 468*. Paris: International Chamber of Commerce.
- ICC (1991). *Guide to Effective Environmental Auditing. Publication No. 483*. Paris: International Chamber of Commerce.
- Ingarvsson, G.Ó. (2004). Map of Bláfjöll area. Unpublished.
- International Institute for Sustainable Development (2004). "Business and Sustainable Development: A Global Guide. Systems and Standards: ISO 14001." http://www.bsddglobal.com/tools/systems_iso.asp. Accessed on February 27, 2004.
- Isaacson, R. (2000). "Now Business Like Snow Business." *Geographical Magazine* 72: 68-71.
- Isenhardt, M.W. and M. Spangle (2000). *Collaborative Approaches to Resolving Conflict*. California: Sage publications.
- ISO (2004). "International Organization for Standardization. ISO 14000: Environmental Management System." <http://www.iso.org>. Accessed on March 10, 2004.
- ITR (2001). "Stefnumótun Skíðasvæða: Fjöllin Heilla." Reykjavík: Íþrótt og Tímstundaráð Reykjavíkurborgar. *Engl*: "Formulating a Policy for Ski Areas in the Reykjavík Area." Reykjavík: The Sports and Youth Council in Reykjavík.
- ITR (2002). "Tillögur til Aðgerða á Skíðasvæðum Höfuðborgarsvæðisins." Reykjavík: Íþrótt og Tímstundaráð Reykjavíkurborgar. *Engl*: *Proposal for Rebuilding Ski Areas in the Reykjavík Area*. Reykjavík: The Sports and Youth Council in Reykjavík.
- IUCN, UNEP, and WWF (1991). *Caring for the Earth: A Strategy for Sustainable Living*. Gland, Switzerland: The World Conservation Union, United Environment Programme, and World Wide Fund for Nature.
- IUCN (1994). *Guidelines for Protected Area Management Categories*. Gland, Switzerland: The World Conservation Union.
- IUCN (1996). *CNPPA in Action*. Gland, Switzerland: The World Conservation Union.

- IUCN (2002). *Management Guidelines for IUCN Category V Protected Areas Protected Landscapes / Seascapes: A. Best Practice Protected Area Guidelines Series No. 9*. Gland, Switzerland and Cambridge, UK: The World Conservation Union.
- Jesitus, J. (2000). "Charter Promotes Environmental Responsibility in Ski Areas." *Hotel and Motel Management* 215 (19): 64.
- Jones, T.M. (1995). "Instrumental Stakeholder Theory: A Synthesis of Ethics and Economics." *Academy of Management Review* 20: 404-437.
- Jónsson, J. (1985). "Jarðsaga Svæðisins á Milli Selvogsgötu og Þrengsla." Bls. 63-82 í *Árbók Ferðafélags Íslands 1985: Þættir um Nágrenni Reykjavíkur*, ritsjtóri Þorleifur Jónsson. *Engl.*: "The Geology of the Area Between Selvogsgata and Þrengsli" Pp. 63-82 in *Yearbook of the Iceland Touring Association, 1985*, edited by Þ. Jónsson. Reykjavík: The Iceland Touring Association.
- Kaplan, D. A. and D. Click 1996. "The Corporate Moguls Play Musical Chairlifts." *Newsweek* December 23, 128 (26): 37.
- Kline, E. (1997). "Sustainable Community Indicators: How to Measure Progress." Pp. 152-166 in *Eco-city dimensions: Healthy communities, healthy planet*, edited by M. Roseland. Gabriola Island, British Columbia: New Society Publishers.
- Landmælingar Íslands (2001). "Suðvesturland: Sérkort, 1:100 000, Fjórða Útgáfa." *Engl.*: National Land Survey of Iceland 2001. "South West Iceland, 1:100 000, Fourth Edition."
- Lane, B. (1992). "Marketing Green Tourism." *Leisure Opportunities* 34 (5).
- Lindberg, K., J.M. Denstadli, P. Fredman, T. Heldt, and T. Vuorio 2001. "Skiers and Snowmobilers in Södra Jämtlandsfjällen: Are There Recreation Conflicts?." Östersund, Sweden: European Tourism Research Institute.
- Línuhönnun 2000. "Mat á Áhrifum Frekari Uppbyggingar Skíða- og Útivistarsvæðisins í Bláfjöllum með Tilliti til Vatnsbóla Reykjavíkur." Reykjavík: Línuhönnun. *Engl.*: "Environmental Impacts of Construction in Bláfjöll Country Park on Reykjavík's Drinking Water Sources." Reykjavík: Línuhönnun - Consulting and Engineers.
- Lög um mat á umhverfisáhrifum (2000). Lög um Mat á Umhverfisáhrifum, nr. 106, 25. maí.2000. *Engl.*: Environmental Impact Assessment Act, No. 106, May 25, 2000.
- Lög um náttúruvernd (1999). Lög um Náttúruvernd, nr. 44, 22. mars, 1999. *Engl.*: Natural Conservation Act, No. 44, March 22, 1999.
- Manning, R.E. (1999). *Studies in Outdoor Recreation: Search and Research for Satisfaction, Second Edition*. Corvallis, Oregon: Oregon State University Press.

- Manning, R. and T. More (2002). "Recreation Values of Public Parks. Once again, Why public Parks?" *The George Wright Forum* 19 (2): 21-30.
- Marsden, C and J. Andriof (1997). "*Understanding Corporate Citizenship and How to Influence it.*" Working Paper. Coventry, UK: BP Corporate Citizenship Unit, Warwick Business School.
- Marsden, C. and J. Andriof (1998). "Towards an Understanding of Corporate Citizenship and how to Influence it." *Citizenship Studies* 2 (2).
- May, V. (1995). "Environmental Implications of the 1992 Winter Olympic Games." *Tourism Management* 16: 269-75.
- Messerli, B. and J. Ives (eds) (1997). *Mountains of the World: a Global Priority*. New York: Parthenon Publications.
- Mihalic, T. (2000). "Environmental Management of a Tourist Destination: A Factor of Tourism Competitiveness." *Tourism Management* 21: 65-78.
- Ministry of Environment, Lands and Parks, B.C. 1996. "Guidelines to Alpine Ski Area Development in British Columbia." Whistler: Ministry of Environment, Lands and Parks and The Resort Planners.
- Mitchell, B. (2002). *Resource and Environmental Management, Second Edition*. Harlow, England: Pearson Education Limited.
- Mitchell, R.K., B.R. Agle, and D.J. Wood (1997). "Toward a Theory of Stakeholder Identification and Saliency: Defining the Principle of Who and What Really Counts." *Academy of Management Review* 22: 853-886.
- Norris, T. (1993). *The Healthy Community Handbook*. Denver, Colorado: National Civic League.
- NSAA (1999). "Safety Initiative Sourcebook." Colorado: National Ski Areas Association.
- NSAA (2000). "Sustainable Slopes: the Environmental Charter for Ski Areas." Colorado: National Ski Areas Association.
- NSAA (2002). "Sustainable Slopes: the Environmental Charter for Ski Areas. Annual Report 2002." Colorado: National Ski Areas Association and The Brendle Group Inc. Environmental Consulting.
- NSAA (2003). "Sustainable Slopes: the Environmental Charter for Ski Areas. Annual Report 2003". Colorado: National Ski Areas Association and The Brendle Group Inc. Environmental Consulting.

- OR 2004. "Orkuveita Reykjavíkur: Vatnsveita." <http://www.or.is>. *Engl.*: "Reykjavík Energy: Waterworks." <http://www.or.is>. Accessed May 22, 2004.
- Orion (2003). "Skíðasvæðið í Bláfjöllum: Framkvæmdir 2003-2007: Tilkynning Framkvæmda vegna Matssyldu." Reykjavík: Skíðasvæði Höfuðborgarsvæðisins og Orion Ráðgjöf. *Engl.*: "Proposed Construction in Bláfjöll 2003-2007." Reykjavík: Reykjavík Ski Areas and Orion Consulting.
- Peterson, K.I. (1994). "Qualitative Research Methods for the Travel and Tourism Industry." Pp. 487-492 in *Travel, Tourism and Hospitality Research: A Handbook for Managers and Researchers, Second Edition*, edited by J.R.B. Ritchie and C.R. Goeldner. New York: John Wiley & Sons.
- Post, J.E., A.T. Lawrence, and J. Weber (2002). *Business and Society: Corporate Strategy, Public Policy, Ethics, Tenth Edition*. Boston: McGraw-Hill/Irwin.
- Price, M.F., L.A.G. Moss and P.W. Williams (1997). "Tourism and Amenity Migration," Pp. 249-280 in *Mountains of the World: A Global Priority*, edited by B. Messerli and J.D. Ives. New York: Parthenon Publications.
- Pro Natura (2000). "Auditing in Ski Areas: A Guide to Ecological Upgrading: Short Version." Lichtenstein: Pro Natura – Pro Ski Foundation.
- Reglugerð nr. 785 (1999). Reglugerð um Starfsleyfi fyrir Atvinnurekstur sem getur haft í för með sér Mengun. *Engl.*: Regulation for polluting businesses. Regulation No. 785, 1999.
- Reglugerð nr. 796 (1999). Reglugerð um Varnir Gegn Mengun Vatns. *Engl.*: Regulation for water protection. Regulation No. 796, 1999.
- Reykjavíkurborg 2002. "Aðalskipulags Reykjavíkur 2001-2024". Reykjavík: Reykjavíkurborg. *Engl.*: "Plan for Reykjavík 2001-2024." Reykjavík: Reykjavík City.
- Robbins, J. (2003). "Stakeholders and Conflict Management: Corporate Perspectives on Collaborative Approaches." Pp. 162-179 in *Unfolding Stakeholder Thinking 2: Relationships, Communication, Reporting and Performance*, edited by J. Andriof, S. Waddock, B. Husted, and S. S. Rahman. Sheffield, UK: Greenleaf Publishing.
- Robson, J., and I. Robson (1996). "From Shareholders to Stakeholders: Critical Issues for Tourism." *Tourism Management* 17: 553-540.
- Rockland, D.B. (1994). "The Environment and Your Customer." *Ski Area Management* 33: 40.

- Rondinelli, D.A. and M.A. Berry (2000). "Environmental Citizenship in Multinational Corporations: Social Responsibility and Sustainable Development." *European Management Journal* 18: 70-84.
- Samþykkt nr. 636 (1997). Samþykkt um Verndarsvæði Vatnsbóla Innan Lögsagnarumdæma Mosfellsbæjar, Reykjavíkur, Seltjarnarneskaupstaðar, Kópavogs, Garðabæjar, Bessastaðahrepps og Hafnafjarðar. *Engl.*: Municipal Ordinance for Water Conservation area Within the Jurisdiction of Mosfellsbær, Reykjavík, Seltjarnarneskaupstaður, Kópavogur, Garðabær, Bessastaðahreppur and Hafnarfjörður. A municipal ordinance No. 636, 1997.
- Samþykkt fyrir stjórn SH og Bláfjallafólkvangs (2003). Samþykkt um Rekstur Skíðasvæðisins í Bláfjöllum (óútgefið). *Engl.*: A Municipal Ordinance for the Operation of Bláfjöll Country Park (forthcoming).
- Sarantakos, S. (1998). *Social Research, Second Edition*. London, UK: Macmillan Press LTD.
- Schmidheiny, S. (1992). *Changing Course: A Global Business Perspective on Development and the Environment*. Cambridge, Massachusetts: MIT press.
- SH (2002). "Handbók Skíðasvæða Höfuðborgarsvæðisins." Reykjavík: Skíðasvæði Höfuðborgarsvæðisins. *Engl.*: "Handbook for the Operation of Reykjavík Ski Areas." Reykjavík: Reykjavík Ski Areas.
- SH (2003) "Þjónustusamningur milli Sveitarfélaga með Aðild að Bláfjallanefnd og Bláfjallanefndar." Reykjavík: Skíðasvæði Höfuðborgarsvæðisins. *Engl.*: "Agreement between Reykjavík Ski Areas and it's Shareholder Municipalities" Reykjavík: Reykjavík Ski Areas.
- SH (2004). "Grunnvinnna fyrir Stöðumat Stefnumótunar." Reykjavík: Skíðasvæði Höfuðborgarsvæðisins. *Engl.*: "Evaluating and Revising Policy and Vision." Reykjavík: Reykjavík Ski Areas.
- SH (2004b). Heimasíða Skíðasvæða Höfuðborgarsvæðisins: Bláfjöll. *Engl.*: Reykjavík Ski Areas' Official Website: Bláfjöll. <http://www.skidasvaedi.is>. Accessed March 12, 2004.
- Shaw, G. and A.M. Williams (1994). *Critical Issues in Tourism: a Geographical Perspective*. Oxford, UK: Blackwell Publishers.
- Sherman, H., D. Neslin, and M. Dummer (1991). "NEPA Reality: It Exists and You can Cope with it." *Ski Area Management* 44.
- Sigurfinnsson, L. Telephone conversation June 9, 2004. Manager, Reykjavík Ski Areas.

- Ski Area Citizens' Coalition (2002). "The Ski Area Environmental Scorecard." <http://skiareacitizens.com/>. Accessed August 24, 2003.
- Skipulagsstofnun (2003). "Úrskurður um Tilkynningu Framkvæmda vegna Matsskyldu Framkæmda á Skíðasvæðinu í Bláfjöllum." Reykjavík: Skipulagsstofnun. *Engl.* "Evaluating Environmental Impacts of Proposed Construction in Bláfjöll Ski Area: Ruling." Reykjavík: The Planning Agency.
- SOMI (1981). *Impact des Amenagements Touristiques en Montagne Ennergnee, Principes de Base*, Tome 1. Aix-en-Provence: Commission des communes Europennes.
- Starik, M. (1993). "Is the Environment an Organizational Stakeholder? Naturally!" Paper presented at Fourth Annual Meeting of the International Association for Business and Society in San Diego.
- State of the Environment, Norway (2001). "The State of the Environment, Norway: Outdoor Recreation." http://environment.no/Topics/Outdoor_recreation-/outdoor_recreation.stm. Accessed March 25, 2003.
- Stefánsson, P. Telephone conversation January 15, 2004. Official, the Health Monitoring Agency of Hafnarfjörður and Kópavogur Area.
- Stein, T. and M. Lee (1995). "Managing Recreation Resources for Positive Outcomes: an Application of Benefits-Based Management." *Journal of Park and Recreation Administration* 13: 52-70.
- Svendsen, A. (1998). *The stakeholder Strategy: Profiting from Collaborative Business Relationships*. San Francisco: Berrett-Koehler publishers.
- Swissinfo (2003). "Investment Race in Swiss Alps Causes Alarm." Swissinfo - Swiss Radio International November 21, 2003. <http://www.swissinfo.org/sen/swissinfo.-html-?siteSect=105&sid=4475098>. Accessed May 27, 2004.
- The Colorado Department of Public Health and Environment, and Tetra Tech (2002). "Greening Your Ski Area: A Pollution Prevention Handbook." Montana: State University Service, Pollution Prevention Information Centre.
- The Parks and Recreation Federation of Ontario (1992). "The Benefits of Parks and Recreation: a Catalogue 1992." Ontario: The Parks and Recreation Federation of Ontario.
- TIAA (1992). "Tourism and the Environment." Washington DC: Travel Industry Association of America.

- Todd, S. (1994). *An Environmental Management System Framework for Ski Areas. Master of Natural Resources Paper, Report No. 147.* Burnaby: The School of Resource and Environmental Management, Simon Fraser University.
- Todd, S and P.W. Williams (1996). "From White to Green: A Proposed Environmental Management System Framework for Ski Areas." *Journal of Sustainable Tourism* 4: 147-173.
- Torfason, H. (2003). "Skíðasvæðið í Bláfjöllum: athugun á jarðmyndum." Reykjavík: Náttúrufræðistofnun Íslands. *Engl:* "Bláfjöll Ski Area – Examination of Geological Formations." Reykjavík: Icelandic Institute of Natural History.
- Tuppen, J. (2000). "The Restructuring of Winter Sports Resorts in the French Alps: Problems, Processes and Policies." *International Journal of Tourism Research* 2: 327-344.
- Umhverfis og Heilbrigðisstofa Reykjavíkurborgar (2004). "Umhverfisstefna Reykjavíkur." *Engl:* "Environmental Policy for Reykjavík." Reykjavík City Environmental Health and Protection Office. http://www.umhverfisstofa.is/default.asp?sid_id=3422&tre_rod=012&tld=1&qsr. Accessed on May 12, 2004.
- Umhverfissráðuneyti (1999). "Sjálfbær Þróun í Íslensku Samfélagi: Mat á Stöðu Framkvæmdaáætlunar." Reykjavík: Nefnd um Endurskoðun Framkvæmdaáætlunar um Sjálfbæra Þróun. *Engl:* "Sustainable Development in Iceland: Evaluation of Implementation Plan." Reykjavík: The Ministry for Environment.
- UST (2004). Umhverfisstofnun, Náttúruminjasrá. *Engl:* Environment and Food Agency, Nature Conservation: Natural Monuments. <http://www.ust.is>. Accessed on June 5, 2004.
- Waldron, D. and P.W. Williams (2002). "Steps Towards Sustainability Monitoring: the Case of the Resort Municipality of Whistler." Pp. 180-194 in *Sustainable Tourism: A Global Perspective*, edited by R. Harris, T. Griffin, and P. Williams. New York: Butterworth Heinemann.
- Weitzman, E.A., and P.F. Weitzman (2000). "Problem Solving and Decision Making in Conflict Resolution." Pp. 185-209 in *The Handbook of Conflict Resolution: Theory and Practice*, edited by M. Deutsch and P.T. Coleman. San Francisco: Jossey-Bass.
- Wilde, T.G. (1998). *Public Participation in the Environmental Assessment of the Jumbo Glacier Ski Area Proposal. Master of Natural Resources Paper, Report No. 224.* Burnaby: The School of Resource and Environmental Management, Simon Fraser University.

- Williams, P. (1996). "Sustainable Alpine Tourism Development: Towards a Self Improvement Approach." Paper presented at International Conference in Innsbruck, May, 1996."
- Williams, P.W., K.B. Dossa, and G. Fulton (1995). "Tension on the Slopes: Managing Conflict Between Skiers and Snowboarders." *Journal of Applied Recreation Research* 19: 191-213.
- Williams, P.W. and S.E. Todd (1997). "Towards an Environmental Management Systems for Ski Areas." *Mountain Research and Development* 17: 75-90.
- Williams, P.W. and I. Budke (eds) (1999). "On Route To Sustainability: Best Practices in Canadian Tourism." Burnaby and Ottawa: Centre for Tourism Policy and Research, Simon Fraser University and Canadian Tourism Commission.
- Williams, P. and A. Gill (1999). "A Workable Alternative to the Concept of Carrying Capacity: Growth Management Planning." Pp. 51-64 in *Tourism Development in Critical Environments*, edited by T.V. Singh and S. Singh. New York: Cognizant Communication.
- Williams, P.W. and P. Fidgeon (2000). "Addressing Participation Constraints: A Case Study of Potential Skiers." *Tourism Management* 21: 379-393.
- Williamson, D. (1991). "Which Came First, the Community or the Resort?" Pp. 22-26 in *Mountain Resort Development: Proceedings of the Vail Conference, Colorado, April 18-21, 1991*, edited by A. Gill and R. Hartmann. Burnaby: Centre for Tourism Policy and Research, Simon Fraser University.
- Wilmott, T. (1994). "The Corporate Look." *Ski Canada* October.
- Wingle, H. P. (1991). "Interrelationship Between the Ski Area and the Resort Community." Pp. 58-60 in *Mountain Resort Development: Proceedings of the Vail Conference, Colorado, April 18-21, 1991*, edited by A. Gill and R. Hartmann. Burnaby: Centre for Tourism Policy and Research, Simon Fraser University.
- Winter Wonderlands (1998). *The Economist* January 31: 86.
- Wolfe, J. (1992). "CSA's Environmental Management Program and its Relationship to Other National and International Environmental Management Systems Initiatives." Presented to the Canadian Institute, Toronto, 23 November and Vancouver, 26 November."
- WCED (1987). *Our Common Future*, edited by G. Brundtland. New York: Oxford University Press.

- WTO (1993). "Sustainable Tourism Development: Guide for Local Planners."
Madrid: World Tourism Organization.
- WTTC (1995). *Travel and Tourism's Economic Perspective: Special Report*. London,
UK: World Travel and Tourism Council.
- Xu, N. (1994). *The Changing Nature of Corporate-Environmental Non-Governmental
Organization Relationships: a Whistler Case Study, Master of Natural Resources
Paper, Report No. 358*. Burnaby: The School of Resource and Environmental
Management, Simon Fraser University.
- Yin, R.K. (1994). *Case Study Research: Design and Methods, Third Edition*. Thousand
Oaks: Sage Publications.
- Yin, R.K. (1989). *Case Study Research Design and Methods*. Newbury Park, California:
Sage Publications.
- Zimmerman (1991). "Issues, Problems and Future Trends in the Austrian Alps:
the Changes within Traditional Tourism." Pp. 160-170 in *Mountain Resort
Development: Proceedings of the Vail Conference, Colorado, April 18-21,
1991*, edited by A. Gill and R. Hartmann. Burnaby: Centre for Tourism
Policy and Research, Simon Fraser University.
- Pórðarson, S.R. Communication by email on February 3, 2004. Quality manager, Catco -
Icelandic Spring Inc.