Integrating Watershed Management—Connecting People to their Land and Water

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Skaftafell in Iceland—A Thousand Years of Change

By Jack D. Ives. Simultaneously published in Icelandic under the title *Skaftafell í Öræfum—Íslands þúsund ár*. Reykjavik, Iceland: Ormstunga, 2007. 256 pp. ISK 5200.00, US$ 75.00. ISBN 978-9979-63-055-5 (English) and 978-9979-63-056-2 (Icelandic).

This is an interesting and unusual book that is not easily categorized. It contains bits of natural history, a lot of personal reminiscing, meditations about conservation of natural and cultural landscapes, and coffee-table quality landscape photography, as well as several other things. The author is—well, a mountain in the field of mountain research and, having edited this very journal for a long time, well known to its readers. The place is Skaftafell, a remote farm property in the district of Öræfi, Southeast Iceland. Some 40 years ago, a large part of the property was designated a national park.

In his formative years as a scientist, Jack Ives dwelled in the mountainous and glaciated landscape of Skaftafell for extended periods as a leader of student research expeditions in glaciology and geomorphology. And 'dwelling,' indeed, it seems to have been. Ives obviously developed a deep appreciation for this place at this formative stage in his academic career. This appreciation surfaces throughout the text. Moreover, Ives was deeply affected by a tragedy that occurred during one of the expeditions, when 2 of the student researchers disappeared without a trace on the glacier. This is described in detail in the book.

The main part of the book is divided into 3 sections. The first traces the dramatic history of the region. Following the settlement of Iceland in the 9th century AD, the area became a prosperous farming district, only to be decimated by the violent eruption of Öræfajökull in 1362. The district never fully recovered from this catastrophic event. Another eruption, in 1727, together with climatic deterioration, glacial advances, periodic flooding and erosion by the rivers, greatly affected the lives of its inhabitants. Nevertheless, the small population of farmers proved resilient and resourceful, and the district has been home to some remarkable and illustrious personalities through the ages.

Ives traces this history by means of a bold literary device: he tells it through several selected characters who have lived at Skaftafell, right from the time of the Icelandic Sagas. In contrast to the terse economy of the Sagas, where emotions and thoughts were kept well out of the way as a general rule, Ives attempts to reveal how his characters perceived their social, as well as natural, environments and acted upon them. Each personal vignette is followed by a commentary from a natural history viewpoint. This makes for an engaging read, although one is left with a certain tension between Ives-the-storyteller and Ives-the-scientist which is never quite resolved.

The second section of the book is a recounting of 3 successive fieldwork expeditions, from 1952 to 1954, instigated and organized by students and young researchers of geography at the University of Nottingham. It is a fascinating account that would lend itself well to an analysis by a sociologist of science. The group managed to muster considerable resources to do some serious scientific work, for instance determining the accumulation of snow on the main ice cap and measuring the movements of the outlet glaciers. Seemingly, those were the happy days of extended, well-equipped fieldwork expeditions to faraway locations, before the advent of the publish-or-perish mentality in academia and an obsession with minute accounting. Apparently, quite a few British geography departments still mount their annual physical geography expeditions to Iceland.

In a way, this is also a story of Öræfi 'before the fall'—before the opening of roads to the east or the west, which brought the district into the orbit of modern nature tourism on a fairly large scale, about which Ives clearly has mixed thoughts. The book's third section is concerned with the transition of Skaftafell from a pastoral farm to a national park which is visited by an ever-increasing number of tourists. Ives traces the emergence of the idea of establishing a conservation area in this place, and how the idea was gradually realized. As in almost every case of national park designation, this did not take place without causing problems. Locals, official institutions and other actors entered the process with differing ideals, understandings, and agendas, and Skaftafell became a contested territory.

Ives states his own views clearly. He does not advocate 'fortress conservation'—in fact, he writes rather disparagingly of what he terms the "US/NZ model" of national parks. Rather, he calls for conservationists to pay due heed to local knowledge and local interests. This is certainly a message never too often voiced. Nevertheless, this reviewer occasionally felt that advocacy of the local sometimes bordered on uncritical celebration of the local. In the case of Iceland, it can hardly be denied that unsustainable land use in previous times affected the country's ecology quite severely. It is one thing to acknowledge and respect accumulated local knowledge, but another to assume that the local point of view *always* leads to beneficial outcomes. It is obvious that a seasoned observer such as Ives well recognizes this, but he could have discussed this important issue in a, perhaps, more balanced way.

The book as a whole, but this third section in particular, is a tribute to the people of Öræfi, and above all to the late Ragnar Stefánsson—farmer, park superintendent, and the author's close friend. In Ragnar, Ives found someone with an astonishing depth of local knowledge and awareness of environmental changes, as well as a genuine desire to maintain and protect these landscapes. This was in the 1950s, well before the wisdom of the locals was generally acknowledged.

The remainder of the book consists of no fewer than 11 appendices, which add much to the book. Some contain letters and other documents that relate to Skaftafell in different ways, whereas others are the author's own essays about life in Öræfi, glaciers in the district, mountaineering, and other topics. Particularly interesting is the description of a seal hunt in which Ives participated in 1954. Graphic descriptions are accompanied by equally graphic photographs. Finally, there is a description of the discovery of the remnants of the last camp of the 2 researchers lost on the glacier during the 1953 expedition (see above).

Maps play an important role in the book. They are of varying quality: some are excellent and appealing, while others seem rather too simplified. On some maps (eg p 32) the choice of colors seems somewhat odd and unnatural to this reviewer, conditioned in a kind of cartographic naturalism. In the first section, a series of maps reveals the state of the settlement since AD 1010, giving a basic indication of glacial advances and retreats, as well as the gradually diminishing vegetation cover caused by volcanism and glacial river erosion. Surprisingly, however, no distinction is made between those farmsteads that were actually settled at the time the map is intended to represent, and those that had been deserted. Thus, the final map from the mid 20th century (p 67) conveys the impression that there were 11 more farms in the district at the time than is actually the case.

The photographs, on the other hand, are exquisite. Many are taken by Jack Ives himself, who is a keen and highly able photographer. His photos in the second main section of the book, documenting the 1952–1954 expeditions, give an invaluable insight into both the expeditions themselves and life in Öræfi in general.

This book was simultaneously published in English and in Icelandic, which is certainly commendable. The translation from English to Icelandic is generally well done, although some passages are a little stiff and the choice of words is sometimes a tad dubious (eg figure caption on p 88).

Given the wide and somewhat eclectic selection of material in this book, it is rather hard to pinpoint a specific community of readers. My guess is that most readers will be Icelanders, but it should appeal to others as well. Written in an accessible and non-technical language, the book is also of great value to anyone who is interested in the natural history of Iceland, and of course the local history of Öræfi. Those working in conservation, certainly in Iceland but even elsewhere, will find it relevant. As this review is being written, Skaftafell has finally become a part of a much larger conservation area that has been discussed for some time: Vatnajökull National Park, the largest national park in Europe. The book should be of value to those involved in the planning of this large park and the resolution of the many issues that will inevitably arise.

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Water, Weather and the Mountain West

By Robert William Sandford. Nanoose Bay, British Columbia: Rocky Mountain Books, 2007. 208 pp. US$ 17.95. ISBN 978-1-894765-93-0.

Robert (Bob) Sandford has had extensive experience in leading environmental initiatives. He was Chair of the UN International Year of the Mountains in Canada in 2002, and also chaired the UN International Year of Fresh Water and Wonder of Water Initiative in Canada in 2003–2004. He is currently Chair of the UN International Decade "Water for Life" Partnership in Canada that advances long-term water issues in response to climate change.

The focus of this book is on Canadian concerns and values. However, these issues are relevant around the globe, so the expressions of concern for the Canadian Rockies and exhortations to action in the face of climate change voiced here warrant wider attention. The book is inspirational in content rather than providing an analytical path to specific adaptations—in fact, it is essentially a primer on valued natural systems and likely impacts of climate change. It is also a personal expression of concern for shaping the future of Canada from what has been inherited from the past.

The book begins with an Invocation that evokes the awe and beauty of the Canadian Rockies, while acknowledging that the great river flows and waterfalls that we see today are partly the result of human-induced global warming. This is followed by 5 sections with somewhat nebulous titles: "Water, Weather and the West"; "The Drinking Water Supply in Canada"; "What We Can Learn from Others"; "Reframing the Climate Change Debate"; and "Future

Landscapes in the Mountain West."

The book opens by noting the geographical mismatch of water availability and population: while water is most available in the north, population centers are in the south. Water waste and poor water quality in the heavily populated areas are growing issues, partly because the institutional framework for dealing with them is so fractured among agencies and jurisdictions—a situation found in watersheds around the world. Sustainable solutions will require greatly enhanced collaboration and historical agreements among agencies and provinces will have to be changed.

The dominance of agricultural water use and the importance of forest watersheds are pointed out, along with the likely impacts of climate change on these systems. This raises serious issues of water allocation and reallocation as well as land management policies that protect the important forest watersheds—problems that are common to all of North America. Canada has already taken significant steps to protect its mountain areas. The Canadian Rockies World Heritage Site attracts and inspires millions annually. Sandford states, "If the myth of limitless abundance of Canadian resources is to be dispelled, that process will likely begin in Canada's western mountains" (p ix).

While historical precedents hamper water management at appropriate scales in most countries, few such obstacles are said to exist in Canada. Alberta's "Water for Life" initiative for integrated watershed management has the potential to overcome historical obstacles and to become a model for all of western Canada. Efforts are being made to advance research and regulatory activities to further protect threatened water resources. Sandford recommends a portfolio of adaptations, including water conservation in all sectors, conjunctive management of surface and ground waters, and increased vigilance in protecting upstream riparian areas.

In spite of listing these accomplishments and noting the potential for innovative policies in Canada, specific solutions are seldom identified in the book. Nowhere in the discussions of the need for more integrated, adaptive water management are the modern tools of water management described—eg real time monitoring, systems modeling, adaptive management, and innovative programs of urban conservation. The use of appropriate pricing that reflects the real scarcity value of raw water is mentioned in the urban context, but the potential for water markets to allow reallocation within agriculture and between agriculture and urban users is not mentioned. In fact, markets are characterized as leading away from sustainable practices: "We get what the marketplace decrees…but don't always get real solutions. It is up to government to sell real solutions such as population control and environmental restraint, but this is not what the marketplace wants" (p 118). While correctly emphasizing the vital roles of government in setting goals, the potential utility of markets in achieving those goals, operating within an appropriate social supervisory framework, is not recognized.

Nonetheless, Alberta's system of protected areas has succeeded in saving much of the original heritage of the mountain west. Now, more spatially integrated policies are needed to protect this vast domain in the face of climate change and pressures from population and energy development.

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Integrating Watershed Management—Connecting People to their Land and Water

By Hans M. Gregersen, Peter F. Ffolliott, and Kenneth N. Brooks. Wallingford, United Kingdom: CABI, 2007. xiii + 210 pp. US$ 70.00, € 55.00. ISBN 978-1-84593-281-7.

It is difficult to escape the barrage of appalling statistics on the global water crisis and the potential impact on human life. 1.2 billion people currently lack access to safe water, and double that number lack proper sanitation. Predictions indicate that 2 out of 3 people will live in a water-stressed area by 2025. Growing demands for food and water are becoming more difficult to satisfy, especially as population growth is greatest in those areas that are least able to bear it from an economic or water resource perspective. Desertification and salinization are reducing the land area available for irrigation. Rapid urbanization will have severe consequences with respect to water service provision and flood vulnerability. Climate change is shifting rainfall patterns so that existing patterns of water use will no longer be possible, at the same time augmenting vulnerability to flood and water scarcity. Glacier melting will affect availability of water, timing and quantity of flow, and create hazards from glacial lake outburst floods (GLOFs). The scope for disagreements between water users, both sectoral and national, is likely to widen.

This increasing attention to the world's freshwater resources has led to a focus on water management practices, as well as the problems caused by inappropriate land management. A result has been general acceptance, not only of the fact that the two should be integrated, but also that decisions affecting water

management in any way should take account of their impact on the quality, quantity and flow of that water. In addition, increased awareness of the downstream effects of upstream uses of water and the demands of basin ecosystems has encouraged management practices that seek to take into account the whole catchment, including both surface and related ground waters. The interests of the various stakeholders in a basin—including users, managers, planners and policy-makers—have increased in importance as well, principally from the perspective of sustainability and equity. Consequently, the management of water, land and natural resources has become much more complex, as the factors to be taken into account now include both quantitative ones—eg water quality, be it chemical or ecological—and qualitative ones—eg socioeconomic questions—that would previously not have been considered together. It has been acknowledged, at the very highest level, that implementation of this new integrated form of water resources management is key to addressing the world's water problems. The names given to this coordinated management vary from "Integrated Water Resources Management" (IWRM) and "Integrated River Basin Management" to "Integrated Land and Water Resources Management" and "Integrated Watershed Management," all of which are largely synonymous. The classic definition of IWRM comes from the Global Water Partnership (GWP 2000): "a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems."

At the same time, however, it has also been accepted that the solution to the world's water problems depends on the quality of the relevant governance framework. This means that any attempt to transpose IWRM into a practical tool must recognize that it is inextricably linked to the governance context. IWRM demands that best scientific practice feeds back into policy and planning, but this relies on an appropriate governance framework being in place. A great deal of research and effort—eg in connection with the GWP Toolbox and UNESCO's Hydrology for the Environment, Life and Policy (HELP) program—has addressed the formidable problems of translating theory into practice, with Gregersen, Ffolliott and Brooks providing one of the most recent outputs. The stated aim of their book is to provide "background information and ... factors to be considered and procedures that facilitate organizing and guiding land and water use in concert with one another; it further serves as a reference for planning, monitoring and implementing development efforts and natural resource management through the lens of integrated watershed management (IWM)." With this in mind, they adopt the following structure: 1) "Challenges and opportunities"; 2) "Land use, watershed management and cumulative effects"; 3) "Institutional context"; 4) "Planning and policy making"; 5) "Hydrologic processes and technical aspects"; 6) "Monitoring and evaluation to improve performance"; 7) "Research, training, information and technology transfer"; 8) "Adaptive, integrated management of watershed: concluding thoughts."

The challenges identified in Chapter 1 and which nominally guide the content of the book suggest that its scope may be narrower than the title implies. They are predominantly land management issues—agriculture and forestry only—and, rather astonishingly, neither climate change nor flooding is mentioned at all. The problems caused by increasing urban development in the basin catchment are ignored throughout the book, and it becomes clear that its focus is really on ensuring that the management of forestry and agriculture is such that water quality and flow downstream are minimally affected. The physical science chapters highlight this and take a fairly high-level approach to land management and hydrology.

The importance of the institutional and governance context is recognized in Chapters 3 and 4, and the authors correctly highlight the difficulties of coordinating practice and policy across inter-sectoral institutions, as well as across political and hydrological boundaries. However, in common with the rest of the book, examples cited from beyond North America are either unbalanced or thin. The importance of information availability for stakeholders is not dealt with other than in the context of training, and protracted borrowing from the authors' previous work in this chapter is jarring. Ultimately, it is difficult to see how the anticipated audience might use this book other than for high-level outlines of some relevant physical science. An absence of integration between the constituent chapters contradicts the intention of producing coherent guidance for practitioners. The narrowness of the scope and the lack of guidance for whole basin management unfortunately limit the interest of this book to land management improvement only, rather than the integrated watershed management it seeks to address.

REFERENCE

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