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*Foreword*

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STEVE LANSING began the work reported here, like many anthropologists before him, with the simple intention of exploring the intricate beauty of Balinese culture. Fortunately for those of us whose appreciation of cultural anthropology is more enthusiastic than professional, his curiosity led him to explore questions and deploy methods that reached beyond the boundaries of his native discipline. The result was an enormously rich study of how Bali's human institutions and environmental landscapes coevolved over the centuries to produce a complex adaptive system. That system proved to be sustainable in the face of volcanic eruptions, dynastic warfare, and colonial invasion. It took the well-intentioned but ultimately arrogant expertise of early Green Revolution reformers to push the system beyond its limits and into a mutually reinforcing downward spiral of ecological and social degradation. *Priests and Programmers* tells the story of how Lansing and his collaborators elucidated the interlinked geological, ecological, social, and religious processes that have shaped the Balinese landscape and, in so doing, became entrained in a process of social learning that helped the system to recover some of its previous resilience.

A wide range of scholars, students, and development practitioners has come to know and benefit from Lansing's story, assisted not only by the lucid writing style on display in this most welcome new edition of *Priests and Programmers*, but also through an excellent film, an accessible simulation model, and a series of follow-up studies, all available through his Web site (<http://www.ic.arizona.edu/~lansing/>). I am one grateful beneficiary of the diverse perspectives Lansing has brought to bear on human-environment interactions in Bali, having used them for more than a decade in teaching a course on sustainable development at Harvard University's John F. Kennedy School of Government. My course uses four detailed case studies to explore how scholars, policy makers, and local practitioners have interacted in efforts to promote increases in human well-being without degrading the environmental life-support systems on which further development depends. I have kept the Bali story in an otherwise-changing set of course cases over the years simply because it is the one that elicits the most learning in my students, and the one they best recall when I talk with them as alumni. What makes Lansing's rendition of the Bali story such a pedagogical gold mine?

First, the Bali story is a specific instance of the much more general case

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of sustainable use of natural resources to support human well-being in the developing world. Half of the world's people still live in rural communities. A billion or so of those people are poor, with livelihoods more or less directly tied to the continuing productivity of natural resources. Often, as in the Bali case, sophisticated local knowledge of those resource systems and their limits has enabled societies to do quite well in utilizing them sustainably over centuries or longer. Increasingly, however, such traditional use systems have come under pressure from efforts to accommodate more people, increase yields, or respond to a globalizing economy. Distressingly often, the result has been catastrophic for both people and the resource systems they inhabit.

Lansing's work is especially valuable in illustrating the multiple forms that may be taken by the "local knowledge" that often turns out to be central to sustainable resource management. The individual villagers he interviewed in Bali clearly knew a great deal about planting rice, protecting it from pests, and building the irrigation systems that provided it with water. Some of this knowledge they could explain to him very articulately. Some was less explicit, consisting rather of the sort of "tacit" knowledge (or knowledge of practice) with which we all are familiar in our daily lives. Lansing's analysis, however, takes the reader far deeper into an understanding of the "local knowledge" that enabled sustainable human development of Bali's steep volcanic slopes. He shows that over the centuries, the value and thus the use of water had taken on not merely material but also spiritual significance for the Balinese. The religious structures, practices, and calendar that revered water for its own sake had evolved in ways that also served effectively to regulate and coordinate the sharing of limited water resources among farmers across entire watersheds. The "local knowledge" guiding sustainability thus consisted of what individuals knew and knew how to do, plus the physical system of irrigation canals and water shrines that such peoples' ancestors had constructed over time, plus the enduring religious beliefs that strongly shaped both individual and social action. The elegant systems models of water use and agriculture on Bali created by Lansing and his colleagues clearly show that each of these sorts of "local knowledge" is crucial for the sustainable use of the system. Though the forms of relevant local knowledge would clearly be different for other resource systems, the general teaching value of Lansing's work is in its compelling illustration that local knowledge matters more than we think, that it is more multidimensional than most of us would imagine, and that it is embodied in forms and places that most of us would not suspect.

This leads to what I, as a teacher, researcher, and occasional policy

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advisor, have found most valuable in Lansing's work: his demonstration that to most of us, most of the time, most of the knowledge relevant to the sustainable management of resource systems may be simply invisible. Through careful archival work, for example, he shows that the Dutch colonial administrators—though more sensitive than most to the intricacies of water management—“saw” only the irrigation hardware of the Balinese and missed entirely the “soft” role of water temples and related religious practices in regulating the use of the hardware. Similarly, Lansing demonstrates that the Green Revolution agronomists—even the Balinese among them—saw the *tika* calendar as an historical irrelevance, missing its crucial role in setting fallow schedules that resulted in effective pest management. Perhaps most strikingly, he illustrates that well-meaning policy analysts—raised in the modern science tradition—were unable to see in religious leaders' generally accurate diagnoses of the crisis conditions of the 1980s anything more than superstition. The cumulative force of these cases of selective blindness sets up one of the most powerful teaching “moments” I have experienced, letting me ask my students (and myself), “What potentially relevant sources of knowledge are *you* overlooking in your present work on sustainable development?”

The stand-and-deliver power of this question is substantially enhanced by Lansing's own demonstration that it can, in fact, be frankly confronted and dealt with. In *Priests and Programmers*, but even more in the associated film *The Goddess and the Computer*, we see Lansing and his collaborators grappling with the challenge of learning to “see” human-environment interactions through multiple lenses. They go further still, wrestling with the even more perilous task of creating shared frames of reference from which different actors—priests, programmers, and bureaucrats alike—can see, and understand, one another's views of the world. The use of computer models and graphics by the Lansing team to facilitate this essential “boundary spanning” role is as subtle and self-critical as any I have seen in a career of making and using models to inform resource policy.

This thoroughly delightful little book has long since become a classic in the emerging field of sustainability science. It elegantly illustrates the field's central tenet that complex human-environment systems can be more clearly understood and more effectively managed through the application of appropriate multidisciplinary concepts, methods, and models. It also reminds us of how important it is that those tools of the field be wielded by individuals who are not only careful scholars, but who also approach their work on the very real problems of sustainable development with appropriate empathy and humility. Its republication in this

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new edition is an occasion for celebrating the occasional ability of good people doing good scholarship to make the world a slightly better place.

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