

Practical Interpretations of a Dynamic Model of Sustainable Tourism

Timothy J. Tyrrell and Robert J. Johnston

Contact: timt@asu.edu

“Operational definitions of tourism sustainability require details regarding what is to be sustained, for whom it is to be sustained, and the level at which it is to be sustained.” This is the introductory sentence to “A Dynamic Model of Sustainable Tourism” (Tyrrell and Johnston, 2005). In it we develop a dynamic model illustrating the interrelated behavior of tourism-related economic and environmental conditions over time. We are proud that this work was awarded the Charles Goeldner, Outstanding Journal Article of 2005 by the Travel and Tourism Research Association. Subsequent writings have suggested practical situations and observable phenomena that validate the model (Johnston and Tyrrell, 2007). However, to date, we have never presented the model at a professional meeting, nor presented simplified implications of the model for tourism tradeoffs and management.

In its published form, the model is mathematically formal and somewhat complex. However, the fundamental implications of the model are straightforward, with intuitive implications for tourism management. We propose to present the model in a “math-lite,” user-friendly version, and describe findings derived by integral calculus using common language. That is, we will present the formal aspects of the model in a simple, user-friendly form useful for those less familiar with complex mathematical models. We do this with no disrespect to the professional expertise of the audience. Rather, the goal is to expose the model and ourselves to new realms of professional conversation, engaging in dialog regarding practical implications for tourism.

The underlying optimization model is designed to assist tourism planners in conceptualizing choices and tradeoffs implicit in various options for environmentally sustainable tourism, at a general level. For simplicity, we will focus the presentation on two stylized groups—industry and residents—although the presented models may be easily adapted to accommodate greater numbers of stakeholder groups. The formal mathematical structure of the proposed model is analogous to that used in certain applications of optimal control theory to biological resources. However, as noted above we will eschew complex mathematical presentations in favor of a more widely-accessible format.

The model is presented as a template—an alternative mechanism that may be added to the toolbox available to those assessing tradeoffs in sustainable tourism. It formally conceptualizes tradeoffs implicit in the search for sustainable tourism outcomes provides greater clarity to that

which is necessarily implied—and not implied—by environmentally sustainable tourism. As such, the model is meant to provide a preliminary step towards greater structure and precision in the discussion of tourism sustainability—a concept that has been subject to considerable ambiguity in prior writings and discourse.

The presentation, based on the underlying dynamic model, will characterize fundamental notions of sustainable tourism. We will present key model findings relevant to the search for sustainable outcomes, and characterize the potential conflicts, hazards, and tradeoffs implicit in the choice among different sustainable futures. Implications of the model will be discussed with regard to a patterns of tourism found in a specific destination—the Okavango Delta of northwestern Botswana. Evidence from this high-value tourist destination illustrates the major findings of the theoretical model as well as divergences between visions of sustainable tourism among different stakeholder groups.

Johnston, Robert and Timothy Tyrrell, “A Dynamic Model of Sustainable Tourism”, Journal of Travel Research 44 (2), November 2005:124-134.

Johnston, R.J. and T.J. Tyrrell. 2007. Sustainability and Tourism Dynamics, in Martin, D. and A. Woodside, eds. *Advancing Tourism Management*. Oxfordshire, UK: CABI Publishers, in Press.