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Governance scenarios for addressing water conflicts and climate change impacts

Christopher Kuzdas^{a,b,*}, Arnim Wiek^a

^a School of Sustainability, Arizona State University, Tempe, AZ, USA

^b Latin American Chair of Environmental Decisions for Global Change, Tropical Agricultural Research and Higher Education Center (CATIE), Turrialba, Costa Rica

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ABSTRACT

Scenarios that portray alternative governance regimes may help support positive change in regions that face persistent water problems. Here, we explore this proposition using the case of Guanacaste, Costa Rica – a region that faces water conflicts and climate change impacts. We developed five alternative scenarios using a formative and participatory approach with system, consistency, and diversity analyses, and visualization. In one scenario, water conflicts surfaced due to opaque governance not accounting for communities that opposed suspect alliances of agencies and developers. In another, challenging contexts overwhelmed fragmented governance causing dissent; which contrasted with another scenario where engaged and vertically accountable governance schemes fit the unique dry tropical regional context and collectively mitigate problems. Governance though, in a return to historical precedent, could alternatively function through top-down schemes to safeguard rural lifestyles; or, operate minimalist schemes that fill only technical roles. The scenario building process facilitated diverse stakeholders to collaboratively explore and articulate alternative water governance schemes. The practical value of the scenarios, however, we found to depend on efforts before and after the study and the successful integration of the scenarios with those efforts. Previous water governance research in the region facilitated partnerships, trust, and active participation in the scenario building process. Timely follow-up demonstrated the real-time application of the scenarios as reference points to help craft strategies that aim to transition current governance toward sustainable alternatives. Governance scenarios, if integrated with a broader transformational planning process, can be a constructive step toward articulating and implementing sustainable water governance schemes. In Guanacaste they helped revitalize coordination and encouraged experimentation through new water governance efforts in the region.

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1. Introduction

Complex water problems are often attributed to deficiencies in how governance regimes are designed and implemented

(Uhlendahl et al., 2011; Biggs et al., 2013). ‘Governance’ refers to the set of collective actions that steer socio-ecological systems toward shared goals and are coordinated among diverse actors (Wiek and Larson, 2012). Successful steering requires, among other things, the anticipation of future

* Corresponding author at: PO Box 875502, Tempe, AZ 85287, USA. Tel.: +1 602 478 9548/506 8543 3082; fax: +1 480 965 8087.
E-mail address: Christopher.Kuzdas@gmail.com (C. Kuzdas).

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developments, problems, and opportunities (Nelson et al., 2007; Fuerth, 2009). Research often proposes such an anticipatory approach to effectively confront complex water challenges (Schneider and Homewood, 2013), and scenarios are often proposed as practical tools to aid these efforts (Quay, 2010). Governance scenarios depict alternatives to current governance regimes and aim to inform people how they could govern water differently. Accordingly, governance scenarios make underlying social-governing systems explicit. Governance scenarios explore alternatives on how to act and govern water in ways that are meaningful to people and beyond the status quo (Wangel, 2011; Fernandez et al., 2014). This difference is critical considering status-quo water governance often fails to resolve, and even drives, complex water problems (Pahl-Wostl et al., 2010; Kuzdas et al., 2014). Governance scenarios that are implemented within transformational planning processes ultimately aim to support people's actions working toward sustainable alternatives (Wiek, 2012). To be effective at this, scenarios must be well integrated within real-time governing processes (Wiek and Walter, 2009; Reed et al., 2013). Yet, there are few comprehensive examples to learn how, and to what extent, governance scenarios can support people in their actions to govern water sustainably (Wiek et al., 2006; Hulme and Dessai, 2008).

In this study, we examine such an example from the water-contested dry tropics of Guanacaste, Costa Rica. Scenario building here was integrated into a broader transformational research and planning process and, accordingly, was built on previous water governance research that had established interest and momentum with partners and stakeholders to tackle currently inadequate water governance regimes (Kuzdas et al., in press). This afforded a research opportunity to address how to optimally develop governance scenarios in a way that can actively support change efforts. The guiding research questions were: What are consistent and alternative scenarios of the water governance regime in Guanacaste? And,

to what extent can scenarios support the re-design of currently unsustainable water governance schemes?

This study offers insights into designing and implementing meaningful anticipatory research and planning approaches in regions such as the Central American dry tropics that face water conflict, climate threats, and current governance regimes that fail to resolve challenges. In doing so, we demonstrate how people in such regions can employ governance scenarios as a constructive step toward realizing sustainable water governance regimes. The study advances design concepts of scenarios that challenge users to engage with governing alternatives beyond the status quo (Wangel, 2011). And, the study implements the scenarios within an integrated research effort that included pre and post scenario-building research components. In doing so, this study advances scenario-building designs and processes that can best support people taking collective action to address complex water challenges (Reed et al., 2013).

2. Study context

Like other areas in the Central American dry tropics, Guanacaste (Fig. 1) is a rural region that experiences a 6-month annual dry season. About 325,000 people lived in Guanacaste in 2011, which is about a five-fold increase from 1950 (INEC, 2011). Starting in the 1950s, the Costa Rican public sector substantially increased in order to meet citizen needs (Booth et al., 2010). For example, Edelman (1999, p.70) notes that the number of public agricultural organizations nearly tripled over a 30-year period. During this time, many public organizations important for water resources were formed such as the Environment, Energy, and Telecommunications Ministry (*Ministerio de Ambiente, Energía, y Telecomunicaciones*, MINAET) that generally oversees water resources in the country. Growing populations in rural areas tested the ability



Fig. 1 – Guanacaste Province, Costa Rica.

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