Social equity and the probability of success of biodiversity conservation

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A B S T R A C T

Conservation actions generally benefit some groups more than others, and this inequity is thought to affect the probability of achieving conservation objectives. This has led to the common assumption that triple bottom line solutions – those that are effective, efficient, and equitable – are best and most likely to achieve each individual objective. Although this may be true, it has been little tested, and importantly lacks a conceptual foundation for understanding, predicting and evaluating how equity affects conservation outcomes. We describe types of equity relevant to conservation and explore how they may affect the probability of successfully achieving conservation outcomes. Depending on the equity type and context, the relationship between equity and conservation success varies. We find that the best conservation outcome is often achieved without perfect equity; highlighting the risk of ignoring the relationship between equity and success. We offer a conceptual foundation for better addressing this important issue in future research and application.

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1. Introduction

Social equity – the equitable distribution of costs or benefits between individuals or groups of people – is a highly sought after ideal in many aspects of society. Whether related to education, employment, or healthcare, equitable outcomes or opportunities can influence the creation, durability, and success of local, national, and international policies (Solar and Irwin, 2007). The conservation of biodiversity is no exception (Halpern et al., 2013). In contrast to health and education, however, relatively little work has been done to understand how, and in what cases, explicit consideration of equity influences effectiveness of a conservation plan or policy (henceforth 'conservation intervention', which can include, but is not limited to: protected area plans/policies,

payments for ecosystem services plans/policies, etc.). Here we aim to enhance our understanding of the relationship between different types of social equity and success in biodiversity conservation interventions, with the goal of improving conservation outcomes. A rich body of literature exists on measuring the effectiveness of conservation interventions, and understanding factors affecting the probability of their success (Bottrill and Pressey, 2012; Ferraro and Hanauer, 2014; Mascia et al., 2014). Success in conservation is broadly defined by achievement of stated goals, which vary according to different values and beliefs. For example, a successful protected area plan could be measured by ecological representation, biodiversity persistence, or economic impact (Parrish et al., 2003; Klein et al., 2010), whereas a successful conservation policy could be measured by improved strength of legislation governing the use of natural resources (Gleason et al., 2010) or community support (Russ and Alcala, 1999). Other conservation outcomes might be measured by changes in social, institutional or human capital (Bottrill and Pressey, 2012; Ban et al., 2013). Ultimately, the success of conservation interventions is often evaluated on the basis of conservation benefit, social equity, and economic return, the three components to triple bottom line

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conservation outcomes (Halpern et al., 2013). Yet the feasibility of achieving such triple bottom line solutions, and the potential interactions and tradeoffs among the three components, remains largely untested. Halpern et al. (2013) found that social equity can compromise achieving efficient conservation outcomes, but highlighted the importance of further research focused on exploring how the relationship between social equity and conservation success might influence these trade-offs, in particular with respect to the many different types of equity. Here, we explore this relationship to provide insight to outstanding questions in conservation, including: Is probability of conservation success actually optimized when all three components are maximized? Or, does conservation success require approaches that deviate from the triple bottom line?

Equity is increasingly recognized as a component of conservation success (Ban et al., 2013; Campese, 2009). However, there are multiple types of equity (Fig. 1), and being clear about what type of equity is important and being measured is critical for understanding the relationship between conservation success and equity. Equity concerns can arise from both internal factors (e.g., composition of the project team), which tend to be within the control of the planning team, and external contextual factors (e.g., social, geographic or economic conditions of the planning region), which are generally beyond the control of the project. For example, the design of a stakeholder engagement strategy might consider equal participation of different groups in a consultation process designed to ensure representation from all affected stakeholders, an internal factor. Alternatively, the variation and spatial distribution of existing income levels in the planning region might determine which populations or communities are affected by restrictions on resource use recommended by a conservation plan, an external contextual factor. While external factors can rarely be controlled, understanding, anticipating and managing their influence on the design and implementation of a conservation intervention is likely to increase its probability of success (Berkes, 2004; Solar and Irwin, 2007). Internal factors can be inputs into, and/or outcomes of, a conservation intervention, and can influence its success (Fig. 1). We believe that consideration of different types of equity improves the chance of achieving conservation success.

The focus of this manuscript is on how social equity, one of many potential conservation objectives and factors affecting conservation success, influences the probability a conservation intervention succeeds in meeting its stated goal. We acknowledge that cases exist where equity plays little to no role in conservation interventions and their success, for example when governments impose protected areas despite local protests (Brockington, 2004), but our emphasis here is on cases where equity matters. We identify different types of input and outcome equity and discuss their possible relationships with conservation success. Finally, we simulate how understanding these relationships can help us evaluate the feasibility of triple bottom line solutions, where social equity, environmental benefit, and economic return are maximized.

2. Social equity in conservation

A complex collection of social structures, economic systems, and policy frameworks determine the relevance of equity to conservation outcomes, and thus conservation success. These social determinants of conservation equity reflect the distribution of wealth, power, and access to resources within a society, and can in turn have different consequences for different types of conservation equity. We identified many types of conservation equity, and divided them into two main categories, input and outcome, that influence conservation success (Fig. 1), all of which can be influenced by socioeconomic and political context (described below in Section 2.1).
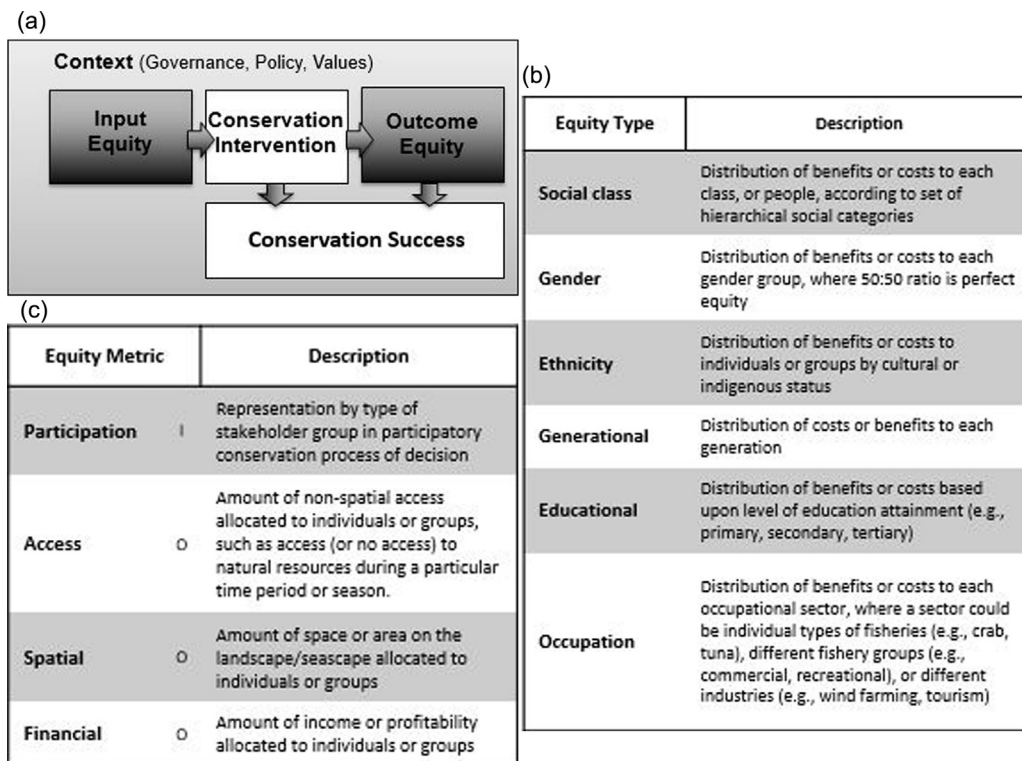

Fig. 1. (a) Conservation success can be influenced by several different types of equity (described in b), both as an input into (e.g., participation by stakeholder groups) and/or an outcome of the conservation intervention (e.g., access to natural resources by individuals or groups). Each type of equity can be influenced by a variety of socioeconomic and political context determinants.