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Marine Policy

Perceptions of ecosystem services and benefits to human well-being from community-based marine protected areas in Kenya

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A B S T R A C T

Marine protected areas (MPAs) have historically been implemented and managed in a top-down way, excluding resource-dependent users from planning and management. In response to conflict and non-compliance, the governance of marine resources is increasingly embracing community-based approaches, assuming that by putting communities at the forefront of planning and management, participation will increase, causing positive social and ecological impacts. Given the relative newness of community-based MPAs, this study explores how resource users perceive their impacts on ecosystem services (ES) and human well-being (HWB). This study explores two community-based MPAs called *tengefus* in Kenya using mixed qualitative methods, including a participatory photography method called photovoice. Participation in and donor support for tengefus influences how resource users perceived tengefus and their impacts on ES and HWB. Individuals who were engaged in the tengefu from the inception or held official positions perceived more positive impacts on ES and HWB compared to those not as involved. Tengefus were often viewed by communities as attractors for external support and funding, positively influencing attitudes and feelings towards conservation. One site, the first tengefu in Kenya, had more external support and was surrounded by positive perceptions, while the other site had little external support and was surrounded by more conflict and mixed perceptions. This study exemplifies the complex social-political dynamics that MPAs create and are embedded within. Community-based MPA initiatives could benefit from ensuring widespread engagement throughout the inception, implementation and management, recognizing and managing expectations around donor support, and not assuming that benefits spillover throughout the community.

1. Introduction

Centralized, top-down governance of natural resources has been criticized for excluding resource-dependent individuals, contributing to an increase in conflict around and non-compliance with conservation initiatives [1–3]. Consequently, there has been an explosion of interest in community-based conservation strategies that are argued to not only protect vulnerable ecosystems, but also engage and support communities who depend on these resources for their well-being [2]. This transition is argued to have started in the 1980s as a product of three important movements: an awareness of growing environmental threats, grassroots development that also emerged in reaction to the centralized top-down aid of the 1950s, and the human rights movement and growing recognition of indigenous rights [4]. Despite their appeal in addressing both environmental and social challenges, community-based approaches are often met with substantial challenges, which can lead to the failure of meeting set social and/or ecological goals [2,5,6].

We examine the social dynamics surrounding two community-based MPAs in Kenya, where there has been a recent shift in the last decade away from top-town management to a co-management approach [7]. We draw on mixed methods and theoretical concepts to explore both the inception and evolution of the MPAs, trace the flow of benefits from each MPA to different groups of people within the surrounding communities, and explore how resource users perceive MPAs and their impacts on ecosystem services and human well-being.

2. Conceptual background

2.1. Marine protected areas: a social-ecological intervention

MPAs, and in particular no-take zones (NTZs) where fishing is prohibited, are widely recognized in the literature as tools that can protect marine ecosystem processes, functions and services [8–11] and have become one of the most popular tools for marine conservation. From the conservation perspective, they are argued to be the most

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tangible part of marine conservation programs and an opportunity to target protection efforts [12]. As of 2014, 3.4% of the global ocean area and 8.4% of all marine area within national jurisdiction had protected status [13] and as of 2010, approximately 5880 parks have been gazetted [14] with many unofficial reserves likely in existence or in development phases. The number of MPAs is likely to increase in the coming years, with the Convention on Biological Diversity Aichi Target 11 aiming for protection of 10% of the world's oceans by 2020 [13].

More recently, MPAs are viewed as opportunities to align conservation and development goals, resulting in potential win-win scenarios for sustainable development [15], as MPAs have been shown to provide fisheries spillover [16,17], contributing to tourism, improved governance, health, and even empowerment of women [18].

Despite their popularity, critiques of MPAs argue that the surrounding social dynamics are often ignored, leading to failures in both the social, and ultimately, the ecological system [19]. However with the increasing recognition that MPAs exist within the context of complex social-ecological systems [20], there is a greater interest in understanding the social dynamics surrounding MPAs. MPAs have been recognized as interventions that reallocate property rights, creating winners and losers [21] with varied impacts on human welfare [22]. The role of governance and power in fisheries management is increasingly recognized [23], with Gustavsson et al. [24] highlighting the role of participation in contributing to local power asymmetries and conflict around MPAs. The dynamics of the inception and planning, referred to as 'step-zero,' are increasingly recognized, and have been argued to influence long-term success [25]. The step-zero concept argues that success of fisheries co-management relies not only on its implementation, but on the way in which the management is conceived, as well as the importance of the conditions, drivers and processes that exist prior to the inception of the MPA [26].

2.2. A shift to a community-based approach

While traditional closures of fishing areas have existed for centuries, the concept of community-based MPAs emerged in reaction to the failures of top-down implemented MPAs that usually excluded resource-dependent users from decision-making [27]. Also referred to as locally managed marine areas (LMMA) [28] and community conservation areas (CCA) [29], the community-based model applied to marine systems first emerged in the Philippines in the mid 1980s [30–32], and has since gained popularity in other parts of the world with growing popularity in East Africa in the last decade [33]. While larger MPAs and MPA networks are recognized as being key for building resilience to climate change [34] and fostering ecosystem-level biodiversity conservation [35], community-based MPAs are increasingly recognized as contributing to these goals. For example, engagement with communities is argued to be vital for maintaining networks of MPAs [36], and the value of traditional and local knowledge is increasingly recognized as being critical for understanding ecological variability in light of a changing climate [37].

Increased research on community-based conservation in marine systems has addressed the social and ecological factors that determine their success [38], the ecological impacts of community-based MPAs [31], perceptions of benefits from MPAs [39], and the legal frameworks that underpin community-based MPAs [40]. In the Philippines, it was also found a variety of factors, such as design and management factors, feelings and emotions, influence community support from MPAs [41].

While often argued as an intervention with the power to address both social and ecological challenges, the experience of community-based conservation has shown that achieving such 'win-win' scenario where both conservation and human development goals are met is a challenge [2,5,6,42]. One critique of community-based conservation highlights the common assumption that 'communities' are homogeneous entities, which leads to the failure of accounting for intra-community dynamics and local institutions that govern behavior

between different individuals and groups, influencing the social and ecological success of community-based conservation [2,43]. 'Elite capture,' referring to disproportional benefits received by local elites from conservation and development, is another challenge in community-based conservation, which can results in perpetuating unequal distribution of benefits and power within communities [2,44].

We aim to contribute to the ongoing debate on these trade-offs between environmental conservation and development in community-based conservation initiatives with a case of the social dynamics that surround community-based fisheries closures in Kenya. This study draws on a range of theoretical concepts and approaches: We examine the history and inception of each case, referred to as 'step-zero' [25] and frame the intervention through a lens of ecosystem services and human well-being through analyzing how people perceive community-based conservation and its impacts.

2.3. Ecosystem services and human well-being: a framework for analysis

The ecosystem services (ES) concept first emerged as a metaphor for human dependence on nature [45] and has since grown in popularity in a number of disciplines including ecology, economics, and development studies [5,46]. The Millennium Ecosystem Assessment (MA) defined ES to be the benefits people receive from nature, with the underlying assumption that ES contribute to human well-being (HWB) [47]. With the increased interest in ecosystem services as a concept and research framing, scholars are increasingly unpacking the nuanced and complex relationship between services and well-being: for example, Raudsepp-Hearne et al. [48] describe 'the environmentalist's paradox,' and theorize why human well-being is increasing while the natural environment is degraded. In a review on the utility of the ecosystem services concept, Lele et al. [49] argue that benefits to people from ecosystems are 'coproduced,' and argue the importance of considering the human agency and capital required to transform services to benefits. This concept is echoed in Daw et al. [50] where a framework on ecosystem service elasticity is presented as a means to both understand feedbacks between the provisioning of ecosystem services and eventual distribution of benefits to different groups of people. This 'disaggregation' of benefits from ecosystem services is increasingly recognized as useful framing for understanding tradeoffs between different interests and actors in conservation and development [51].

The ES concept has only recently been applied to MPAs, where MPAs are argued to protect supporting and regulating ES that in turn, contribute to human welfare [52]. The ES and HWB framework provides a way to understand the multifunctional nature of MPAs, as well as examine the different types of associated benefits and costs. The ES and HWB framework also has mechanisms for addressing complexities and feedbacks in both the social and natural systems, especially relevant for MPAs where these dynamics are evolving and co-dependent. For this study, we use three MA categories for ecosystem services (provisioning, regulating, cultural) to understand how ES from community-based MPAs contribute to well-being. We also use the term 'benefits from ecosystem services' to refer to the benefits enjoyed by people that do not directly fit into the ecosystem services framework. This characterization of benefits has been suggested in recent literature on ecosystem services as a means to further refine the MA categories [51,53]. The well-being lens alone [54] has recently been argued as a useful approach for understanding the multiple contributions from fisheries to human societies with an increasing number of case studies drawing on this approach for understanding fisheries governance [55–57]. We define social well-being following Gough and McGregor [58] as 'a state of being with others, where human needs are met, where one can act meaningfully to pursue one's goals, and where one enjoys a satisfactory quality of life' [59]. This definition forms the base for the three-dimensional approach that goes beyond material well-being