

Review

# Participation, Power, and Equity: Examining Three Key Social Dimensions of Fisheries Comanagement

Barbara Quimby <sup>1,2,\*</sup> and Arielle Levine <sup>1</sup> 

<sup>1</sup> Department of Geography, San Diego State University, San Diego, CA 92182-4493, USA; alevine@sdsu.edu

<sup>2</sup> Department of Geography, University of California, Santa Barbara, CA 93106, USA

\* Correspondence: bquimby@sdsu.edu

Received: 23 June 2018; Accepted: 30 July 2018; Published: 18 September 2018



**Abstract:** Comanagement of natural resources is a well-established approach to the management of common-pool resources such as small-scale fisheries, operating in multiple contexts and settings for over two decades. These programs are expected to be adaptable and promote social and ecological benefits, such as sustainable livelihoods and biodiversity goals. As programs mature, it is important to consider how some core principles of comanagement have manifested in practice, as well as whether they deliver on these promised benefits. Drawing from the conservation, small-scale fisheries, and fisheries management literature, this paper examines three fundamental principles of fisheries comanagement: participation, equity, and power. The conceptualization, definitions, and measures of each theme are presented, with discussion of the current gaps in the literature. We also demonstrate the deep interrelationships between these key dimensions of comanagement, and the need for greater attention to their combined influence on comanagement outcomes and processes. While the literature offers foundational ideas for incorporating these themes into fisheries comanagement practice, tethering these concepts to clear, but context-specific goals and practices is essential for improving social outcomes. We find that key goals of fisheries comanagement could be impeded by the lack of depth in addressing these themes in practice, and suggest the need for greater critical attention to their expressions in comanagement processes.

**Keywords:** equity; power; participation; small-scale fisheries; comanagement; social outcomes; marine conservation; coastal resource governance

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## 1. Introduction

It is difficult to dispute the staying power of community-based management approaches to natural resources, or comanagement. Comanagement is widely promoted as a preferred approach for managing complex social-ecological systems associated with small-scale fisheries. It is defined as a community-based process for common-pool resource management, which integrates institutions and actors at multiple scales of governance, from the state to the local [1]. Ideally, it combines the best of top-down and bottom-up approaches, linking resource users, government agencies, and other stakeholders through vertical and horizontal connections and providing mechanisms for collaboration and adaptive creativity [2].

Comanagement arrangements are expected to be flexible and culturally appropriate to their specific context, empowering resource users with decision-making and enforcement authority. In small-scale fishing contexts, this has often meant the inclusion of traditional and customary tenure rights [3–5], and traditional ecological knowledge (TEK) of fishers to compliment and fill gaps in scientific knowledge of biological phenomena [6,7]. With these inclusive principles, comanagement aspires to create a socially responsible and democratic management approach that integrates the needs of communities with sustainable natural resource management [1].

Though not without its flaws, comanagement is considered by some to be the most promising solution to managing small scale fisheries [8]. Comanagement programs have been implemented in multiple countries and contexts, for both artisanal and industrial fisheries, with the aim of increasing the participation of fishing communities in management and improving long-term sustainability [9–13]. Given the diverse contexts for fisheries comanagement, much of the scholarship examining these programs focuses on institutional arrangements [14–17], including interactive governance [18]. However, this institutional focus may underplay the importance of place, social context, and the agency of actors within and around those institutions. In particular, notions of participation, power, and equity are inherently complex, but are often poorly defined or measured in comanagement programs' design and outcomes despite their role in the functional dynamics of management institutions. The influence of these factors on comanagement outcomes could potentially be underestimated, leaving some uncertainty as to comanagement's effectiveness on promises of broad social benefits and socioecological sustainability.

Here, we review perspectives from the literature on three of comanagement's core principles: collaborative power-sharing, improved participation, and enhanced equity, particularly in the context of small-scale fisheries comanagement. Our aim is to advance the understanding of social dynamics and outcomes in fisheries comanagement policies and programs by providing a more complete and nuanced understanding of these key concepts. We examine how power, participation, and equity are identified and discussed in the literature, explore the emerging definitions of each concept, and review proposed methods for evaluating these concepts in comanagement practice. In addition, we discuss the conflicts or consensus surrounding power, participation and equity in comanagement, and the important interconnections between them. We draw from the broad literature on fisheries and marine resource comanagement and conservation, including a mix of case studies, review papers, theoretical works, and critical analysis from the fields of geography and political ecology. Our focus is on works that explicitly address power, participation, and/or equity in coastal marine settings, with the majority describing case studies or multisite comparisons of small-scale fisheries comanagement in developing country contexts. Examples from Asia-Pacific, Africa, and South America dominate the selections, with a few additions from Europe and North America. We have also included some works that discuss transnational fisheries, commercial fisheries, and marine protected areas, if they also addressed any of our themes directly. Finally, we present opportunities for furthering the discussion of these themes and incorporating them more robustly for the benefit of comanagement practice.

## 2. Power

Power-sharing is an explicit tenant of comanagement [19], making the power relationships within a community and between the community and external agencies at different scales a key consideration of programmatic design. However, in practice, comanagement's broad template means there can be significant variation in the ways that power is exercised and shared varies across comanagement contexts. Jentoft [20] notes the need for more research into how comanagement arrangements organize, reinforce, and negotiate power relationships. Discussions of power in comanagement often center around the formal institutions and overt processes where leadership and authority are negotiated, especially formal power-sharing arrangements between the state and the community. However, implicit forms of power, and the way that these shape comanagement arrangements and outcomes, remain under-recognized and under-analyzed. In this section, we review the origins of power sharing as a comanagement principle, the different ways that power is conceptualized in the comanagement literature, and highlight areas where greater attention is needed to the exercise of power and its outcomes. We consider both overt and covert forms and processes of power, but emphasize that these are not necessarily dichotomous.

### 2.1. Why is Power Sharing an Explicit Goal of Comanagement?

Comanagement is defined as a “power-sharing arrangement” [19] or a continuous state of power negotiation [21]. It is often described as a shift away from top-down, state-driven management to a participatory, multi-scaled approach that partners government organizations, local communities, resource users, and often regional or international non-governmental organizations (NGOs). These entities are united in a management process that emphasizes learning and knowledge, adaptation, flexibility, and the inter-connectedness of social-ecological systems [1,22,23]. These principles came into prominence in the 1980’s and 90’s, as scholars and practitioners in conservation and natural resource management began to highlight the importance of community involvement [24–26]. Recognition of the failures of centralized power and “command and control” approaches in environmental management and conservation worldwide provided an opening for alternative strategies that inverted top-down management structures, instead charging local communities and resource users with responsibility for management and enforcement [27]. Practitioners who advocated for local control believed it would be more efficient and effective in managing resources than market forces or state regulatory actors [28], more adaptable through the inclusion of traditional knowledge [29], and more socially just for local communities by “making each participant less vulnerable to the power of others” [20].

In some contexts, where local users’ historical systems of natural resource management had since been displaced by market forces or state control, comanagement was framed as a return to “traditional” practices, a “rediscovery” of management approaches that had worked before capitalism and colonialism shifted power away from local people [5,29–31]. At the same time, the push for a shift in responsibility away from the state to local resource users reflected change in international development theory, which now emphasized neoliberal individualism and self-reliance through market-based strategies [32]. The confluence of these two philosophies shaped the power-sharing principles of comanagement, together emphasizing decentralization and devolving decision making and enforcement responsibilities to the local level [33]. However, this also created inherent tensions when traditional values and social norms conflicted with a neoliberal emphasis on market-based mechanisms, privatization or the commodification of nature [33–35]. This tension underlies and complicates the negotiation of both overt and covert forms of power in comanagement.

### 2.2. Overt Forms and Processes of Power

Comanagement explicitly creates new forms of power, and processes for using and negotiating power between multiple actors and multiple scales, primarily through the development of institutions. Institutions help to structure human interactions and collective actions: Laws, norms, and some “rules-in-use” [36,37]. Strong formal and informal institutions can support the implementation of comanagement and increase the likelihood of program endurance in heterogeneous and dynamic communities and groups of actors [23]. However, institution building can take enormous effort and time to take root [38] and benefits from local self-organization [39]. Comanagement institutions can “emerge” as resource users and communities recognize a new need for cooperation and self-organize, often with support from NGOs or the state, due to a growing crisis [40,41]. Yet what emerges is not necessarily entirely new: Comanagement systems often draw upon pre-existing, recognizable and legitimized institutions. Comanagement arrangements may provide these institutions with new forms of authority and responsibilities, integrating them in new ways into state hierarchies. Examples of traditional institutions integrated into state systems for natural resource management include the role played by the village *Fono* in the Samoa islands [42,43], or the *Panglima Laot* in Aceh, Indonesia [44,45].

Building on existing institutions can be efficient and more culturally relevant, but strengthening the power of traditional systems can also reinforce power asymmetries and encourage elite capture [20,46]. Strong local leadership has been identified as a vital feature for comanagement success [8]. Local leaders play a critical role in the development and sustainability of a program, as they are often the original drivers of comanagement efforts [40] or emerge to champion and legitimize

comanagement arrangements at the grass-roots level. Regardless, the new power arrangements negotiated through comanagement institutions provide an opportunity for local leaders (both old and new) to become indispensable for successful comanagement and solidify their position of power in the management of natural resources [47–50]. Scholars have expressed concerns about power asymmetries and economic inequalities that are created or reinforced by comanagement [51]. However, the complexity of social structures and social capital within communities involved in comanagement has received only limited attention from institutional analysis approaches. For example, Warren [52] examines the governance of seaweed harvests in Bali, finding that dense social relationships of a tight-knit community can create problems for natural resource governance, with uneven benefits going to elites compared to other local actors. By emphasizing leadership and institutions in power analyses, the potency of other forms of social capital and cohesion may be overlooked.

Distinctive from the broader development and conservation literature, comanagement emphasizes power-sharing and capacity building more than “empowerment” of the local community, but the concepts share philosophical roots. Jentoft asserts that empowerment is “both a condition and a goal” of small-scale fisheries comanagement [53], described as sharing in (and perceiving to have) influence or control over the processes that affect individuals, communities, and organizations. To achieve this level of self-determination, empowerment can sometimes mean institution-building, to develop the legal authority and formal mechanisms for developing and enforcing regulations [13]. Davis and Ruddle [34] argue that institution building often helps to legitimize the state’s power over the local. In practice however, this works both ways, as customary practices, “rules-in-use”, and traditional tenure can also be formalized in comanagement institutions, which may limit the state’s direct power [54,55]. Empowerment can also mean education and training, or “capacity building”: Providing local leaders with the required skills to take on new management responsibilities [56]. This is the definition most frequently observed in international development programs, with an implication that training be provided by external groups (as opposed to “self-organization” or “self-empowerment”), and these forms of community “empowerment” are ultimately granted (and judged adequate) by the state or other outside groups [57,58]. Cleaver [59] argues that these processes of empowerment are driven by a neoliberal focus on individuals, and while comanagement approaches purportedly prioritize communities and institutions, they can also fall into this reductionist approach.

While the implementation of comanagement almost always restructures power arrangements, many scholars have illustrated that it does not necessarily distribute power more equitably or reduce state control over resources. Research on fisheries comanagement outcomes in Africa has found that programs may change the distribution of power and responsibilities among community members, but these programs rarely reduce, and often solidify, the power held by the state [47]. Empowerment is often intended to facilitate participation, through formal or informal approaches, but in many cases the “micro-processes” of human interaction and the opaque nature of bureaucracy can also conspire to make management institutions “inherently exclusive”, as the elite retain control while putting forth a seemingly participatory process [60]. Through this illusion of empowerment, formal institutions can obscure covert processes of power.

### *2.3. Covert Forms and Processes of Power*

While identifying formal power vested in institutions and individuals is generally straight-forward, there are many covert forms of power that are more challenging to identify and examine, but which carry equally important implications for comanagement outcomes. Many comanagement theorists note the importance of examining the sociocultural processes that define power relationships within the context of a particular setting in order to develop fair and functional management and avoid elite capture. As Armitage et al. [1] (p. 98) emphasize: “Without an understanding of class, ethnicity, gender, and other structuring dimensions of society, the social, bureaucratic, and scientific segmental tendencies that constrain flexibility and the sharing of governing authority will go unchallenged”. While some societal relationships are formally codified, the ways in

which they are practiced, negotiated, and reinforced are largely informal. The multiple subjectivities of an individual, including the social groups and institutions to which they belong, offer different routes for the accumulation and sharing of power. Social network theory, for example, considers the ways that individuals, in both formal and informal positions of authority, can become invested with informal power and social capital within a community [48,61], and how this in turn can influence comanagement outcomes outside the role played by formal institutions.

The internal power relationships described above are further complicated by power relationships between local actors and external groups, such as the state and NGOs. These external actors may undercut the power of and influence of local and indigenous worldviews by emphasizing values associated with positivist scientific approaches and market mechanisms, disembedding fisheries management from its local social context. For example, scientific justification for the reclassification and regulation of spaces to improve natural resource management can shift power away from traditional local systems into the hands of the state [62,63]. In this way programs can inadvertently benefit the elite more than others [51], or be manipulated to claim collaboration without actually devolving power away from the state [34,64,65]. In contrast, the constitutionality approach suggests that external agents, such as state actors and NGOs, can, under certain conditions, serve as catalyzing agents and provide a “fair platform” for the development and recognition of new institutions of resource management [66]. To avoid undercutting community authority, power relationships should be understood and examined as embedded within a social-ecological system.

#### *2.4. Power in Fisheries Comanagement*

Jentoft [20] provides an extensive critique of the different expressions of power in fisheries comanagement literature, presenting the varying definitions of power, what drives power, and its purpose and effect. He notes that within fisheries research, power is frequently an implicit factor, rather than the focus of attention. He further emphasizes the need to examine the relational and collective dimensions of power, as power does not only sit within the structures of institutions but also between individual actors. Power can be both constructive and destructive, a force for change or a conservative force reinforcing the status quo. Jentoft also notes the opportunities for social theory to inform fisheries management by examining power in “real-life” contexts that inform actors’ use of, and engagement with, power. In all, fisheries comanagement programs would benefit from an improved understanding of the role of power in comanagement structure, implementation, and outcomes.

### **3. Participation**

Comanagement programs introduce new forms of power sharing and the devolution of power and authority to local levels, requiring broader participation by individuals and groups in management processes. The absence of community participation and local knowledge in centralized, government-driven resource management has been identified as key contributing factors in their failure; for example, the infamous collapse of cod fisheries in the North Atlantic, [67]. As such, participation became another key feature of comanagement, a signifier of power-sharing expected to support positive social and ecological outcomes [2], especially in a common pool resource such as fisheries [37]. In spite of this essential role and common concerns about participation across the development and natural resource management literature [68–70], there remains little consensus on what participation means, the forms it should take, or how inclusive or diverse participation should be to meet these goals of power-sharing, knowledge-sharing, and social equity. Here we consider the spectrum of conceptualizations, goals, and forms of participation realized in the literature.

#### *3.1. Conceptualizing Participation*

In contrast to power, participation has been the explicit focus of many studies of small-scale fisheries comanagement around the world [71–74]. Yet the extensive attention given to fostering and measuring participation in fisheries comanagement has eclipsed its complexity, variability,

and meaning [68,75]. Participation can take many forms depending on program goals and power dynamics [76]. Arnstein [77], for example, conceives of participation as a “ladder,” progressing upwards as levels of citizen involvement increase from non-participation to ‘tokenism’ to citizen control. While Arnstein’s ladder is useful as a broad conceptualization, the descriptors provided for different levels of involvement are static and do not adequately reflect the dynamic nature of participation (and negotiations of power), which can evolve and change over time [78]. In contrast to Arnstein’s focus on power and control in decision-making, Pretty [79] offers a typology that considers the motivations of those who use participatory approaches [80]. Key to both of these typologies is that they are normative measures, meaning that both the context and the power relationships between the actors are important in determining the goals, degree, and effects of participation.

### *3.2. Goals of Participation in Comanagement*

Although participation and community engagement are often identified as critical factors for “success” in managing fisheries and marine protected areas, [81–84], the potential benefits to management and the goals of this participation vary widely in comanagement literature, and are rarely problematized. Why is participation important? Often participation is a strategy for achieving “buy-in” from the community and compliance with management rules [68,85], or as a means to legitimize the authority of the management program [86]. Turnhout et al. [87] take a broader view of participation as the practice of shaping the purpose and expectations of the management process, while simultaneously negotiating identities, needs, and values of different groups and individuals. Participation is also an essential component of knowledge-sharing, a key principle of comanagement [19]. However, a review of participation in coastal management literature by Puente-Rodriguez [76] finds that gaining environmental knowledge and sociocultural understandings of nature are rarely made explicit goals of participation.

In addition to enhancing support for natural resource management programs, proponents of comanagement consistently claim that participation can also provide social benefits to communities through more effective incorporation of local needs and priorities. Yet too often comanagement programs fail to account for differences in access, attitudes, and outcomes for community members, women in particular [88–90], and “community participation” does not always capture fair representation of the heterogeneity of communities [91]. For example, Gelcich et al. [92] found that groups of Chilean fishers responded very differently to comanagement based on their attitudes towards the environment, traditional access rights, livelihoods and their socioeconomic motivations for participating. Disregarding internal diversity and agency can undermine efforts at democratic and representative participation, and can have the unintended consequence of worsening inequality and the vulnerability of certain groups, and potentially sabotaging the stability of comanagement programs. It should also be said that participation does not imply agreement or consensus, as discussed below.

### *3.3. Forms of Participation and Institutional Arrangements*

Though it varies with context, comanagement design encourages participation through formal institutional arrangements such as legislative frameworks, policy processes, or mechanisms for cooperation and power negotiation [82]. Democratic principles are often emphasized as a means to encourage participation by diverse members of the community [83], in order to support inclusive and equitable decision-making beyond a technocratic or advisory role [93]. However, this process of democratization does not necessarily consider the social relationships and power asymmetries that already exist, nor do they critically analyze who is (and who is not) participating [47,94]. Traditional leadership and customary authority can be incorporated into these formal arrangements, which may strongly influence who is included or excluded from participation. For example, Steenbergen’s case study of a comanaged marine area in Indonesia [49] describes the internal community tensions that arise between dominant and peripheral groups when customary leaders are engaged in participatory management efforts.

Self-organization and collective action provides another means for participation in comanagement. This process may begin informally and can allow room for diverse actors to participate, but who participates depends heavily on actors' agency, interest to become and stay engaged, capacity for engagement, as well as higher level recognition and support [40,95]. Formal, externally-driven forms of collective action, such as participatory action planning, are also believed to bring positive changes including greater cooperation [95]. In either case, developing institutions through collective action can be a slow process that demands trust and deliberation developed through repeated interactions [96].

In some cases, the goals and ideal forms of participation differ between resource users and those driving comanagement efforts. Walley [97] describes how notions of participation in Mafia Marine Park diverged between the international agencies, the government, and local communities. While government representatives viewed participation to mean local actors would enact decisions made by a centralized power, communities interpreted participation to mean they would have decision-making authority. Representatives of international organizations had varied reasons for encouraging participation, with some viewing it as a more efficient means to get residents "on board" with conservation agendas, while others saw participation as a means to empower rural residents and encourage greater accountability to their needs and priorities. There was no consensus on what form participation should take, who would participate, and who would benefit, creating tensions between the groups.

#### 3.4. *Who Are the Participants?*

Participation is strongly mediated by social relationships and power dynamics: the relationships between and among local as well as non-local actors, including the state, NGOs and transnational corporations [98], and the power that organizers may have to establish the rules and goals for participation. In cases where community participation is called for, defining a "community" that will participate in co-management presents challenges given the complex and overlapping ways that people self-identify, which may include geographic, social, or activity-based identifiers as well as interests, actions, and normative characteristics [99]. Yet those who have the power to define community, who may be internal or external to the co-management system, ultimately determine who is invited and allowed to participate [100–102]

As such, broad community participation does not guarantee bottom-up democratic processes or increased equity [60].

The methods used to identify and represent groups for participation in planning and decision-making processes also matter, as do the diverse and changing roles that individuals play within a community and as participants. For example, Jacobsen and Ebbin [103] demonstrate how actors in the Pacific Northwest must negotiate multiple identities as they move between different vertical and horizontal levels within the comanagement organization, while Raakjær [60] reveals that comanagement actors in Greenland negotiate their positions, as their views, interests, and commitments change over time. Individual agency is also a key factor: if stakeholders feel their voice is not heard equally to others, they may also choose to withdraw from participating [94,104].

#### 3.5. *Timing of Participation*

The timing of participation, when in the management process it occurs and is encouraged, has consequences for comanagement outcomes [80]. For example, programs that delayed community involvement until the implementation stage have been found to be less effective at meeting conservation goals [105] and more likely to exacerbate economic inequality [106]. However, programs where the community was engaged during the early planning stages, for example through participatory action plan development [95], were better able to create positive social and ecological outcomes. Kittinger [107] offers another example of facilitating participation through participatory research in Hawaii, where a shared understanding of the ecological and social context of the proposed comanagement program was built through early community engagement.

Interestingly, while most emphasize the importance of early participation in comanagement, in some cases participation may be more effectively introduced and easier to achieve during the later stages of a comanagement program. For example, [108] found that community members were more willing to participate once they saw new enforcement efforts taking place, which strengthened community engagement with government agencies which they had previously viewed to be ineffective and unaccountable. Yang and Pomeroy [104] also found that longer programs supported greater participation and in turn more equitable outcomes, as trust in the process was established over time. Still, it is important to recognize that participation is not static, and as institutions and politics around fisheries management change, so too can the level and value of participation over time [64].

#### 4. Equity

Equity has been an intrinsic goal of community-based management and conservation efforts for decades, and achieving social equity and justice in comanagement settings is increasingly seen as key to long-term sustainability [56,109]. Perceptions of equitable outcomes has even been suggested as a measure of a program's legitimacy [110]. Yet while equity is clearly valued, it is not operationally defined or well incorporated into fisheries management practice. It has sometimes been discussed as a byproduct of comanagement power-sharing and participation [111,112], but with little critical discussion [113]. Within the field of conservation, greater attention has been given to defining the dimensions of equity with its inclusion in the Aichi Target 11 of the Convention on Biological Diversity [114]. This has buoyed recent calls to do more to advance definitions and approaches to measuring equity in conservation [113,115,116], with implications for small-scale fisheries comanagement. This section considers the definitions, goals, and features of equity discussed across the literature.

##### 4.1. Equity in Small-Scale Fisheries and Conservation

In the context of small-scale fisheries, authors have focused on the goals and outcomes of equity: It can improve livelihoods, decrease poverty and reduce vulnerability among fishers [117,118]. In their review of inequality in the small-scale fisheries literature, Fabinyi et al. [119] found that perceptions of inequality were a critical concern for local fishers in Papua New Guinea and the Philippines, impeding management and governance. Not surprisingly, the FAO, in partnership with the Too Big To Ignore (TBTI) working group [120], identify equity and equality as key principles for managing small-scale fisheries.

Equity and perceptions of equity are considered useful in supporting the "governability" of resources such as small scale fisheries, facilitating community buy-in and acceptance of resource governance programs [18]. Governance that is perceived as just can support greater compliance and therefore improved conservation outcomes [109,121]. Singleton [23] argues that this is because equity makes institutions more efficient by reducing transaction costs. Equity is not just considered important for governance, but also social well-being. For example, Barnett and Eakin [117] approach equity and vulnerability of a Nova Scotia fishery by examining the interplay of structure and agency, finding that perceptions of a just institutional design and sense of control over resources influenced fishers' livelihood outcomes.

Yang and Pomeroy [104] attempt to address the complexity in defining equity, linking it to both participation and power: They measure perceptions of participation as one of five dimensions of equity (along with influence, control, access and income). They find these indicators rise with community-based management fisheries, noting the particular importance of household size on perceptions: Larger households presumably have more social capital and larger networks, providing a power advantage in discussions and decision-making. This recent turn toward identifying the elements of equity in fisheries management aligns with discussions in the conservation literature, which focuses on distributive and procedural justice. Distributive justice is the fair distribution of costs and benefits,

economic and social, across a population, while procedural justice focuses on the decision-making institutions and power relations within that process [106].

In addition to distributive and procedural justice, authors have added a third factor, referred to as either input equity [122] or contextual equity [123]. This refers to the pre-existing social, political and economic conditions that shape equitable values and relationships, such as local social hierarchies, gender inequality, or issues of scale (individual, household, community, etc.), that can affect participation and benefits received from management efforts. Zafra-Calvo et al. [124] present a similar three-part approach that includes distributional equity, procedural equity, and recognition or respect for local values. However, the goals of equity and conservation may not always overlap; Klein et al. [122] found that the best conservation outcomes did not necessarily coincide with the highest levels of social equity. They identify three different ways of defining equity: Absolute equity, relative equity, and perceived equity, reflecting the different scales and perspectives involved in determining equity, which may differ amongst different community members, or between community members and conservation groups.

The plurality of equity's forms, its embeddedness in local place and social context, and its highly normative nature present challenges to developing a common framework for defining and measuring equity. While authors note the importance of social and environmental context, it can be difficult to incorporate the specific history, values, and perspectives of the community in which a management program is operating. For example, Delaney [125], finds that ideals of equity in Japan reflect social hierarchies, and fishing access and rights vary with one's level of participation and time as a member of the fishing collective. Carothers [126] uses a normative approach that draws from political ecology to examine equity in the distribution of access and rights in a commercial Alaskan fishery. More commonly, quantitative measures are used to capture differences in material gain and changes in participation, which are not enough alone to capture the picture of equity. In their analysis of ecosystem services and food security, Golden et al. [127] find it necessary to use a disaggregated analysis to understand inequality across a community at different scales, and to capture variation in the distribution of ecosystem services benefits between households.

While these examples demonstrate an awareness and interest in equity in the fisheries and conservation literature, considerable gaps remain in understanding and assessing equity in small-scale fisheries comanagement contexts. Some attention has been given to the equitable distribution of social costs and benefits, with evidence of uneven distribution between and within communities in some cases [51,128]. In Kenyan fisheries, Cinner and McClanahan [129] examine issues of equity through the lens of perceived "winners" or "losers" of comanagement, finding that over time most fishers felt they were benefiting from the program, which increased their belief in its equitable outcomes. Pomeroy et al. [86] suggest using equity as an indicator in itself of 'successful' comanagement in small scale fisheries in the Philippines. Still, examples of research that explicitly examines equity in fisheries comanagement are scarce and lack attention to the plurality of forms of equity discussed in broader conservation literature.

#### 4.2. Social Justice and Equity

Equity is sometimes conflated with social justice in the literature, yet these concepts are not exactly the same: whereas equity can in part be measured materially (who gets what), justice is a normative principle that draws on social mores and values about what is "fair" (who gets what, relative to others based on rules or norms). The two concepts often meet in the conservation and comanagement literature when discussing equitable access to resources for livelihoods [130,131]. Equitable arrangements for resource sharing is sometimes offered as examples of social justice outcomes, though in practice these arrangements may not necessarily deliver on promises of equity. For example, the interests of indigenous groups can be marginalized by centralized management that uses broad approaches to sharing resource access and overlooks the unique needs of indigenous communities [132]. Similarly, new rules to promote equal access among individuals of differing social

status may fail in their intentions if elites are better equipped to adapt to new rules (e.g., through greater ability to change gear type or fishing strategies), or if formal rules are selectively enforced with some groups (e.g., non-relative, non-local fishers) and not others [50].

When measures of equity and social justice focus primarily on access and livelihoods, an understanding of the greater context that informs local perceptions of fairness in comanagement may be a key omission. Hauck [85] notes that while social justice has gained increasing attention from small-scale fisheries researchers, fishers' perspectives and the history of power behind current laws are underappreciated. She argues that this is because SSF management has focused on (particularly economic) drivers and incentives for rules compliance by individuals, overlooking the more normative concepts of social justice.

The concepts of equity and justice are also understood to be linked in the equitable sharing of power between resource users, government, and other stakeholders [112]. In transboundary commercial fisheries, Campbell and Hanich [133] have called on the international community to consider the responsibility of governments and NGOs to avoid causing harm and to share opportunities fairly in the name of equity and social justice. So have Bennett et al. [134], who present a "Hippocratic Oath" for marine conservation and identify distributional equity as an "aspirational goal" (p. 414). As noted, it is already the norm for comanagement to recognize and address issues of inequality and injustice at the community level, but the way these issues are conceptualized and measured differs tremendously. Carothers [126] points out that these inconsistencies in the way equity is addressed across the social sciences make it more difficult for communities to unite around equity as a political issue: it is easier to recognize inequality than envision its solution, even among similar communities, and perceptions of what is equitable can vary by individual or by social context.

#### 4.3. Gender Equity

One dimension of equity frequently visited in the small-scale fisheries literature is gender equity. As with other marginalized social groups, barriers to equity for women have arisen from both local cultural contexts and from bias in institutional designs. Neglecting gender dimensions and differentiation has been shown to lead to biased and incorrect assessments of management success, and undervalue the often informal role women play in community networking, adaptive management, and resource regulation in social-ecological systems [89,135]. Research has shown the significant contributions women make to fisheries worldwide, often through informal or unrecognized methods that are overshadowed by assumptions about fishing practices [136]. Gender equity in fisheries is an acknowledged priority of FAO and is also a guiding principle of the SSF Guidelines; however, more research is needed to understand how gender equity in access, decision-making, and opportunity improves economic outcomes for communities or conservation success [137].

Gender has sometimes been treated as an oppositional binary between men and women, in which women are treated as passive and homogeneous, rather than diverse individuals with agency and sometimes conflicting interests, in what Davis and Nadel-Klein [90] described as the "add gender and stir" approach. For example, while some researchers see a spatial division of labor between sea and land inhibiting women's involvement in fishing, Volkman [138] offers a more complex perspective of women's agency in Indonesia, where narratives of modernization provided women space to push gender roles and transition from looming to perform fishing tasks, increasing their freedom of movement and their economic opportunities. Gendered divisions of labor are often the focus of studies that do attend to the role of women in fisheries; yet the importance of gender in household power relationships and decision-making, resource management activities, and social networks is still greatly undervalued and requires more nuanced attention [139,140].

However, as with other forms of equity, there is little consensus on how to define or measure gender equity. It is most frequently described in terms of economic opportunity and decision-making power through participation [56,89]. Complicating the issue is the paucity of gender-specific data on fishing globally, which impedes efforts to quantify the value of women's labor and participation in

fishing and incorporate that knowledge into equitable management design [141,142]. An additional challenge to measuring gender equity is that comanagement programs often emphasize formal institutions, which may exclude women by default if they are not formally organized [143].

In sum, while equity is now seen as a priority in the conservation literature, it remains an underdeveloped concept in practice, measures, and goals, particularly in comanagement. Where equity is examined, it is more often in terms of distributive justice, with less attention to its other dimensions. Quantitative indicators of equity, such as wealth and participation rates, receive the greatest attention but there remain gaps in data collected by gender, and growing concern for more normative and contextual dimensions as well. Discussions shy away from the existing causes of inequity and too often overlook the historical socio-cultural context and power dynamics of a place. Evaluations of equity require local context, scale, and understanding that values of equity can change as the process of comanagement evolves.

## 5. How These Themes Intersect

As noted throughout the paper, these three themes are tightly interwoven. The drivers of each theme are in part co-produced by the others: for example, participation is often considered both a contributor to, and an outcome of, social equity and power sharing. In turn, equity is a goal described by many as achieved through broad participation in decision-making power. Authors across contexts often use these themes to define, support, or measure one another. In practice, there is empirical evidence that supports their interdependence; for example, poor individuals perceive greater livelihood improvements than their wealthier counterparts when they are involved in decision-making [144]. When management processes were built upon the traditional institutions of a majority group, existing power asymmetries were mitigated through inclusive processes, resulting in more equitable benefit distribution in the community [49]. Devolving power over marine resources from the state to the local level through comanagement has also been shown to have the outcome of redistributing benefits to villages [129]. Unfortunately, these implicit interconnections between participation, power, and equity are rarely made explicit, and critical discussion of their relationships are largely absent from the fisheries comanagement literature.

However, there are examples from the broader conservation and sustainability literature that seek to integrate these three themes, such as the constitutionality approach, [145,146]. The concept of constitutionality arose as a mechanism to better understand successful collective action and institution building for natural resource management under conditions of power asymmetries, emphasizing emic perceptions of the need for new institutions, participatory processes of negotiation that address power asymmetries, pre-existing institutions as a basis for collective action, external catalysts, recognition of local knowledge, and higher level acknowledgement and support [66,95]. Constitutionality processes have shared ideals of comanagement, including local self-organization and inclusive institutional development. While this perspective offers a practical approach to address the blended subjects of equity, participation and power in emerging governance processes such as fisheries comanagement, constitutionality's primarily institutional focus may still under-emphasize covert forms of power and social capital, and case studies from the literature continue to struggle with defining successful local outcomes.

Comanagement's key elements of collaborative power-sharing, improved participation, and enhanced social equity are all reliant on the interplay of these themes, with significant implications for comanagement processes and outcomes. The desired outcomes of comanagement principles are sometimes attributed to one social factor, such as participation, yet we find that all three themes inevitably influence comanagement processes, with the intersections of power, participation, and equity driving the challenges and opportunities for achieving these outcomes, as presented in Table 1. When the interplay of these themes is overlooked, there is evidence that it weakens the effectiveness of comanagement by enabling elite capture, exclusionary decision-making, and reinforced power asymmetries. It is also important to recognize how these concepts are informed by conservation, development, and neo-liberal perspectives, and the potential biases and conflicts those origins can impart.

**Table 1.** Theme intersections and implications for key comanagement principles.

Intersections	Key Principle of Comanagement	Desired Outcome	Challenges/Negative Outcomes	Approaches for Improving Outcomes
Power and participation	Collaborative power-sharing	Sharing decision making across scales and between diverse stakeholders within the community, resulting in more equitable governance arrangements, and greater adherence to rules, knowledge-sharing, and adaptability	Institutions built on existing, hierarchical structures that privilege the existing elite; power does not devolve from the state; nominal or token participation of marginalized groups	Examine how overt and covert power relationships are embedded within the local social-ecological context, and how that informs collaboration dynamics. Regularly evaluate decision-making and participatory processes to check for continued involvement of diverse groups and development of trust over time.
Equity and participation	Improved participation	Ecological knowledge sharing, adaptability, improved social outcomes for diverse social groups, and incorporation of local needs into project goals	Loss of contributions and involvement of minority groups; challenge of accessing minority groups, participation may require extended time and resources	Consider internal community heterogeneity and the need for diverse representation. Identify differences between the program design and community conceptualizations of fair, representative participation. Design opportunities for direct input from underprivileged groups.
Power and equity	Enhanced social equity	Distributive justice for communities and community members, balanced distribution of social and ecological benefits	Poor inclusion of marginalized social groups, desirable outcomes defined by those in power, elite capture, diminished ecological outcomes.	Identify social capital across networks beyond the formal power structure. Involve diverse voices in defining desirable outcomes of comanagement. Regularly evaluate both perceptions and material measures of equity across the community.

## 6. Conclusions

This review demonstrates the need for more attention to the concepts of participation, power, and equity in fisheries comanagement, not simply as individual factors but as co-creative, context-driven, and interconnected elements. Examinations of participation and power in the comanagement literature have helped to illuminate their complexity and depth, and equity now requires the same critical reflection. Measures or goals that focus on just one of these factors are also incomplete without acknowledgment of how power, participation, and equity shape each other. Bringing these three concepts together makes their interrelationships and importance for enabling key principles of comanagement more visible, but also shows the work still required to define them and put them into practice.

There are significant implications for fisheries comanagement design and practice. This review suggests the vulnerabilities of comanagement design to underestimating the combined dynamics of social factors in influencing processes for decision-making and the outcomes for resource users. It should not be taken for granted that new institutions for comanagement will alleviate or circumvent existing power asymmetries and social inequities to allow for broad participation and justly distributed outcomes. To meet the key principle of power-sharing, comanagement programs should be encouraged to consider both covert and overt forms of power, including relationships at different scales of governance, and strive for participation that pushes past an advisory role towards inclusivity in decision-making. Institutional processes require grounding in normative, context-driven conceptualizations of equity and participation that are relevant to the actors involved, as exemplified by some of the recent studies included here. Measures and goals must also be explicit in how they address these factors, both as individual themes and as interconnected processes.

Our findings also offer valuable lessons for informing approaches to power, emancipation and justice as key facets of critical and transformative sustainability sciences. The literature presented offers examples of how the process and institutions of resource management have often been built in favor of existing power asymmetries; however, they can simultaneously be the tools for widening access and participation when critically examined with the perspective of the heterogeneous community. Recognizing both formal and informal power relationships, across scales and distances, can also help sustainability sciences to improve the outcomes of governance for local resource users. As demonstrated here, the concepts of emancipation and justice also require a normative approach that recognizes their many attributes in order to be realized in sustainable practices. Efforts to address distributive and procedural justice, and the diverse forms of equity they help shape in natural resource governance, are emerging but still require greater depth in theory and practice. Conceptualizations of all three facets require acknowledgment of their situated and complex natures, and their interconnections, for the benefit of sustainable and just resource governance.

Looking forward, new research is needed to test the definitions and measures proposed in the literature, and to develop fisheries comanagement approaches that explicitly address and assess equity, participation, and power in their institutional design. The foundational ideas presented in this review of the broader fisheries and conservation literature provide a strong starting point, but these ideas require more explicit definitions and greater attention to how they are linked within comanagement processes for decision-making, resource access, and social outcomes. This review focused on three critical themes, however there are other important social factors described in the literature to consider as well: Agency, culture and values, and human well-being can also intersect with the themes discussed here, and present important areas for development in both research and practice [116]. Comanagement continues to be a robust approach to small-scale fisheries management, which will only improve with more explicit attention and development of these themes.

**Author Contributions:** B.Q. and A.L. conceived of and structured the paper; B.Q. performed the literature review; B.Q. and A.L. wrote the paper.

**Funding:** This research received no external funding.

**Acknowledgments:** This research was supported by the Department of Geography, San Diego State University.

**Conflicts of Interest:** The authors declare no conflict of interest.

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