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How Marine Protected Areas Are Governed: A Cultural Theory Perspective

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Abstract: Marine Protected Areas (MPAs) have become recognized as important management tools for marine and coastal ecosystems in the last few decades. However, the theoretical underpinnings of MPA regimes have arguably not yet received sufficient attention. This paper attempts to remedy this by exploring how the Cultural Theory initiated by Dame Mary Douglas can provide a theoretical foundation for the current debates about the design of MPA regimes. It does so by firstly noting that the various types of MPA governance discussed in the literature correspond to the ways of organizing, perceiving and justifying social relations recognized in Cultural Theory. The article continues by setting out how Cultural Theory helps to explain when and why MPA regimes succeed or fail to reach their goals. In particular, the article highlights the practical importance of accommodating all ways of organizing and perceiving social relations in any MPA management plan. Finally, the paper suggests that further systematic, empirical work for assessing MPAs needs to be undertaken so as to corroborate the arguments advanced in this paper.

Keywords: Marine Protected Areas; Cultural Theory; clumsy solutions; messy regimes

1. Introduction

Marine Protected Areas (MPAs) have become one of the most widely used tools to manage marine and coastal ecosystems in the last few decades [1,2]. During this period, discussions about the governance aspects of MPAs have seen a steady increase [3–5]. Mounting pressures on coastal and marine resources, the adoption of international conservation targets to increase the size of protected areas and the prevalence of nominally declared protected areas (or "paper parks") are some of the main reasons that have resulted in this trend. An MPA is loosely defined as any coastal or marine area, including its resources, which is regulated through formal or informal arrangements. MPAs can cover areas from less than 1 square kilometres to more than 100,000 square kilometres (often labelled Large-Scale Marine Protected Areas or LSMPAs), both types of MPAs sometimes co-existing in a same region, as best illustrated in the Pacific [6]. In their early development, the bioecological aspects were the main focus and little attention was given to their social aspects. Yet, a number of researchers have shown that social, economic and institutional aspects of MPAs are the main determinants of the degree of acceptance from communities and that these have a significant impact on their long-term success [4,7].

Despite this increase in debate, the theoretical underpinnings of MPA management regimes still have not received sufficient attention [8]. Governance here is defined as "the formal and informal arrangements, institutions and mores which determine how resources or an environment are utilized; how problems and opportunities are evaluated and analysed; what behaviours are deemed acceptable or forbidden; and what rules and sanctions are applied to affect the pattern of resource and environmental use" [9] (pp. 90–91). According to our understanding, there are at least

four basic, and one hybrid, forms of MPA governance to be found in recent literature: top-down, centralized management; bottom-up, community-based management; private management led by private industry or non-governmental organizations (NGOs); mismanaged (or paper park) MPA (Mismanaged MPAs are those that have been associated with collusion, corruption and nepotism. We argue that the so-called "paper parks" form the main component of this category). These basic forms of MPA governance are often hybridized, i.e., two or more of them are combined, which gives momentum to what are often labelled co-managed MPAs; in this framework, the diverse stakeholders involved follow different rationalities and therefore have to define compromises. The notion of finding and using a hybrid form of governance as an alternative approach for environmental governance has received increased recognition in recent decades [6,10].

In this paper, we argue that the basic forms of MPA management overlap with the four ways of organizing, perceiving and justifying (namely, hierarchy, egalitarianism, individualism and fatalism) that are set out in Cultural Theory pioneered by anthropologist Dame Mary Douglas. On the basis of this argument, we outline various contributions that Douglas' Cultural Theory can make to MPA governance discussions. The first of these concerns Cultural Theory's ability to capture different perceptions and behaviours of individual and collective actors in a socio-ecological system, in a relatively simple, yet comprehensive manner. The second contribution lies in the notion of *clumsy* or *polyrational* solutions. These are policy solutions that emerge from creatively combining and accommodating the theory's four different ways of organizing, perceiving and justifying social relations. According to Cultural Theory, only such policies can be effective and widely endorsed [11,12]. The concept of clumsy solutions has been proposed and implemented in a number of environmental studies [13,14], including coral reef management [15–17]. In this article, we extend these applications to MPA governance. The third and final contribution concerns how to organize decision-making so as to create viable and sustainable MPA governance. Cultural Theory contends that, in order to be viable, MPAs need to combine all the basic types of governance regimes. We will refer to the resulting forms of collaborative governance as *messy regimes* [18].

The remainder of the paper consists of five sections. In the first, we introduce Cultural Theory. In the subsequent section, we briefly discuss Cultural Theory's concept of clumsy solutions. In the third, we describe the relation between the four management regimes and the elements of Cultural Theory's typology. We further illustrate that the rationalities distinguished in Cultural Theory provide a possible theoretical foundation for each of the management regimes in the MPA literature. We also give several examples of how MPAs based on the predominance of a single rationality (instead of on a combination of diverse rationalities) tend to fail to reach their official targets. In the fourth section, we describe a relatively recent form of natural resource management (also adopted for MPAs), the co-management regime and discuss the contribution that Cultural Theory could make to the further understanding and development of such a regime. We exemplify our explanations empirically using the case of Tubbataha Reefs Natural Park in the Philippines. The last section offers suggestions for future research.

2. Cultural Theory

Cultural Theory (shorthand for "theory of socio-cultural viability") has been developed for over five decades. It has emanated from the grid–group typology that was introduced by British anthropologist Dame Mary Douglas in the 1970s [19,20] and further developed by Aaron Wildavsky, Michael Thompson and Richard Ellis [21–23], among others. In her typology, Douglas identified two dimensions of sociality (grid and group) and argued that people's involvement in social life can be captured and assessed according to these two dimensions. "Grid" stands for the degree to which role differentiation and stratification constrain the behaviour of individuals. "Group", by contrast, represents the extent to which an overriding commitment to a social unit constrains the thoughts and actions of individuals. As illustrated in Figure 1, Cultural Theory derives four ways of organizing, perceiving and justifying social relations (often called "ways of life" or "social solidarities")

by assigning two values (high and low) to the grid and group dimensions. These ways of organizing are usually dubbed *individualism*, *fatalism*, *hierarchy* and *egalitarianism*. Moreover, each of the ways of organizing comes with a set of beliefs, biases and behaviours suited to upholding and abiding by that method of organizing. For instance, Cultural Theory [24,25] states that each of the "myths of ecological stability" (or "views of nature") discovered by ecologist C.S. Holling [26] sustains and justifies (indeed, renders natural) one of its ways of organizing.

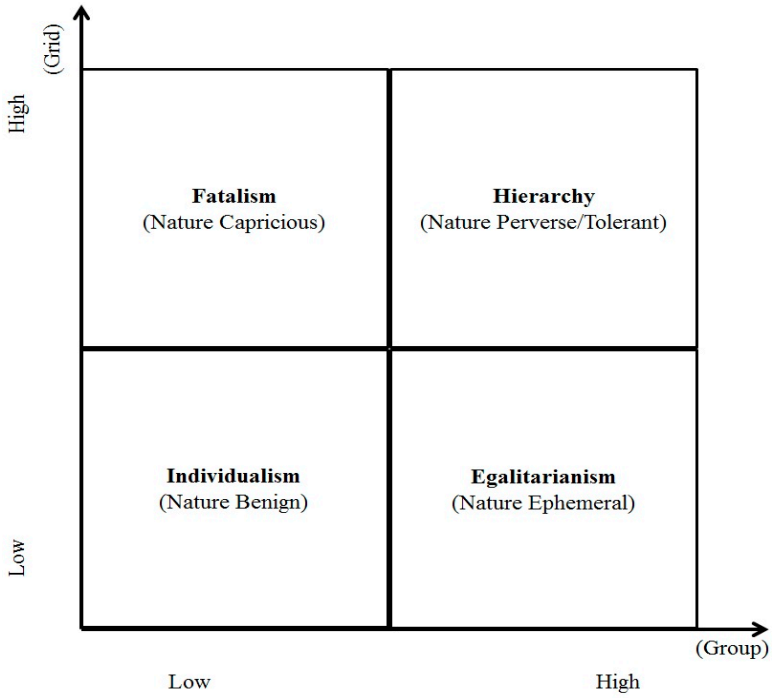

Figure 1. The grid-group typology and the four ways of life.

Hierarchy occupies the top right quadrant of the grid/group map. Within this quadrant, strong group boundaries and binding prescriptions are the main characteristics of the actors' social environment [23]. In this social setting, people are subject to control from both others (qualified members/experts) as well as socially imposed roles (determined by those higher up in the echelon, such as scientific experts, tribal elders, or religious leaders). This way of life creates hierarchically nested social groups, characterized by orderly and ranked relationships, in which members are assigned different roles and responsibilities [24]. Humans are perceived as imperfect but controllable and redeemable through firm and enduring, top-down institutions. Fairness is determined by law (authority) and those who do not follow the law are seen as guilty or liable [27]. In this social setting, people adhere to "a procedural rationality that is more concerned with the proprieties of who does what than with trying to evaluate the outcome" [24] (p. 7). Actors understand ecosystems with the help of a "perverse/tolerant" myth of nature. That is, they assume that ecosystems are stable, until pushed beyond certain limits. Environmental management requires certified experts to determine these limits and statutory regulation to ensure that human activity is kept within them.

Egalitarianism occupies the bottom right quadrant of the grid/group map. Actors within this social solidarity have less internal role differentiation and no individual has the authority to exercise control over others. As a consequence, resolving internal disputes is difficult [23] (p. 6). Intensive interactions among members and "shared opposition to the outside world" maintain the group's strength [27] (p. 400). Actors within this domain develop "a communal and critical rationality, which stresses fraternal importance and sororal cooperation" [24] (p. 7). Within this egalitarian way of life, "fairness is equality of result" whereas "blame is put on the system" [27] (p. 400). The actors adhere

to a view of nature as "fragile." They see the world as delicate and intricately interconnected and nature as ephemeral. Any small disturbance could lead to a complete collapse of the system. Therefore, the only solution for environmental problems is voluntary simplicity and precautionary principles must be firmly imposed on those who are not tempted to share the simple way of life.

The bottom left side of the grid/group map portrays the individualistic way of organizing and perceiving social relations. Here, individual freedom has primacy. "All the boundaries are provisional and subject to negotiation" [23] (p. 7). Within this social setting, individuals adhere to a substantive, results-oriented rationality. People are seen as inherently self-seeking and atomistic and the preferred management institution is the one that works with the grain of the market. Fairness is seen as equality of opportunity, which should ensure that those who invest the most get out the most. Actors view nature as "benign", i.e., as highly resilient and able to recover from any exploitation. As resources are therefore understood to be unlimited, trial and error can go on unimpeded.

The top left quadrant of the grid/group map represents the fatalistic (or despotic) way of organizing, perceiving and justifying social relations. In this social setting, people are expected to be fickle and untrustworthy and each actor therefore has to focus on maintaining and (if at all feasible) improving his or her position vis-à-vis others [28]. Power considerations and survival are dominant themes and fairness cannot be expected to be achieved in this life. Hence, the rationality that prevails is a deeply cynical one. Actors experience the world as unknowable and adhere to the myth of nature that portrays ecosystems as "capricious." "Why bother?" is therefore the rational management response [29].

According to Cultural Theory, these ways of life are interdependent, yet constantly in competition with one another. Each way of life compensates for certain features of experience and wisdom that are missing in the others and offers an alternative plausible account of how we should live with one another and with nature. Yet, each way requires all the others in order to be sustainable [29]. Therefore, each social domain–at any level of analysis, from a family to an international regime–is characterized by the waxing and waning, merging and splitting, of the four ways of organizing and perceiving social relations. Moreover, policy discourses are in constant flux due to the enduring clash between policy actors adhering to alternative ways of organizing and perceiving, which forces them to constantly update, revise and re-invent their preferred policies in light of the criticisms received (even though their fundamental assumptions—those concerning nature, human nature, justice, risk, time, space and so on—remain unchanged). As such, Cultural Theory is a dynamic approach, which stresses that both social domains and policy discourses are forever being transformed. The theory also recognizes that actors can adhere to alternative (combinations of) ways of organizing, perceiving and justifying social relations in different social settings.

3. Clumsy Solutions

Cultural Theory's typology helps to view social and environmental issues from four alternative policy perspectives, each one emanating from and representing, a specific way of organizing and perceiving social relations. The approach takes an additional step in arguing that successful solutions to pressing social and environmental ills tend to creatively and flexibly combine all these alternative policy perspectives. Such forms of governance are usually called "clumsy" or "polyrational" solutions [13,30] and creatively mix individualistic, egalitarian, hierarchical as well as fatalistic views on what the problems are and how they should be resolved. The theory predicts that a policy solution that does not employ all these rationalities will fail to reach its goals [31,32]. "Success" and "failure" of policies are of course highly contested concepts and will be evaluated on the basis of different norms and values by adherents to alternative rationalities. Yet by postulating that its four ways of organizing, justifying and perceiving social relations are interdependent (i.e., cannot be sustained by themselves), Cultural Theory offers a potential resolution to the problem posed by moral pluralism [33]. This postulate namely implies that policies that do not combine insights from all policy perspectives will not only fail to reach the goals of the excluded perspectives but will also fail to achieve the aims of the included perspectives. In other words, Cultural Theory

predicts that "non-clumsy", or overly monolithic, policies will fail to meet their own targets and meet with widespread public rejection. Clumsy solutions are thus akin to Cass Sunstein's [34] concept of "incompletely theorized agreements" and John Rawls' [35] notion of "overlapping moral consensus": policies that are endorsed by a large majority of stakeholders, albeit for different reasons and from alternative moral vantage points.

The clumsy solutions hypothesis has received ample empirical support [30]. It has been validated in a great many case studies, including the handling of radioactive materials in hospitals [36], pension reform in Europe [37], development projects in Nepal [38,39], reducing landslide risk in Southern Italy [40], global efforts to combat climate change [29], the WHO's efforts to reduce malaria [41] and contemporary whaling [42], to name but a few examples. The US Environmental Protection Agency currently claims that the notion of clumsy solutions informs its stakeholder dialogues and future policy-making (see: https://www.epa.gov/risk/multi-criteria-integrated-resource-assessment-mira). However, it is important to note that not all problems may have clumsy solutions. The types of clumsy solutions may also differ at any given time and place, despite the similarity of the problems. Thus, it is vital to create enabling conditions, for example messy institutions, that can foster the emergence of such solutions.

When it comes to governing marine and coastal resources, clumsy solutions can pertain to many issues, including how to manage resources, how to fund resource management, who has the right to access resources and how they can do so, the scale of protection areas, capacity building, livelihood diversification, conservation incentives and resource stock rebuilding [43,44]. On all these issues, stakeholders are likely to adhere to different understandings of what the problems at hand are and how these should be addressed [45]. A practical example of a clumsy solution can be found in the management of Tubbataha reefs in the Philippines, which we explore in section five.

4. MPA Management Regimes and Cultural Theory

Cultural Theory has several implications for understanding MPAs and their governance. According to the approach, any MPA can be viewed as a constantly changing combination of hierarchical, egalitarian, individualistic and fatalistic ways of organizing, perceiving and justifying social relations. In addition, Cultural Theory recognizes that the perspectives of MPA stakeholders (those of including policy analysts) may contain elements from several of these rationalities and that stakeholders' views will change over time. Yet the approach also states that, through debate and polarization, the perspectives of many stakeholders will, by and large, tend to fragment along the four fault lines set out by the approach. Furthermore, Cultural Theory highlights the risks involved in allowing decision-making about MPA management to be dictated by stakeholders (and analysts) advocating a monolithic perspective on MPA governance. Due to the inherent socio-cultural diversity and change of MPAs, such as overly narrow perspective will fail to reach its goals and create other havoc besides. Hence, clumsy solutions (that are flexible and seek to exploit, rather than reduce, socio-cultural plurality) are needed for sustainable MPA governance.

Cultural Theory's four ways of organizing, perceiving and justifying social relations can be used to derive four-ideal typical ways of governing MPAs. Interestingly, these four ideal-types appear to overlap, to some extent, with the basic forms of MPA governance that have been distinguished in the academic literature. In short, centralized MPA management is favoured by the hierarchical way of organizing, a community-based MPA is the egalitarian ideal, entrepreneurial MPA management (EMPA) represents the individualistic preference, while an opportunistic or mismanaged MPA is expected by the fatalistic rationality. Our argument is not that any existing community-based MPA can be expected to be fully egalitarian, or that any EMPA is wholly individualistic, etc. Indeed, Cultural Theory states that this cannot be the case, as it holds that socio-cultural diversity is ineradicable. Instead our argument is that, as each of these modes of organizing MPAs has been widely implemented and advocated over other modes, Cultural Theory can contribute to a more general explanation of MPA failure and how this can be prevented. Below, we start this explanation by outlining the four

ideal-typical modes of MPA governance that can be deduced from Cultural Theory. We do so in Table 1. We then note the overlap between these ideal-types and the four basic modes of MPA management that have been widely advocated and implemented. We also list the objections that have been raised against each of these modes and illustrate these objections with an empirical example. All this allows us, in Section 5, to highlight the need for clumsy MPA governance.

4.1. Hierarchy—Top-Down, Centralized MPA Management

Marine protection began, as did terrestrial based conservation, with a centralized, government-led, top-down approach. Nowadays, top-down, centralized environmental management regimes are widely found in colonial and post-colonial tropical countries [5,46]. Such an approach usually covers a large area in which the central government and its experts act as the primary sources for decision-making and management activities. Proponents of this type of regime often argue that there are four primary benefits of having a centralized top-down policy: (1) it potentially offers economic benefits; (2) it is based on a strong scientific basis; (3) it is faster in terms of program implementation; and (4) it is more likely to protect critical habitats [47,48]. Conversely, scholars have argued that some major drawbacks of this type of management regime include the lack of local and context-specific knowledge that is used in decision-making and the limited extent to which local people are involved [46,49]. As a result, policy makers might not be fully aware of the social, economic and ecological impacts of the implementation of their decisions at the local level, as local people's aspirations are rarely considered.

There have been many discussions on how a strictly top-down, centralized management style failed to manage coastal and marine resources [50]. Prominent examples include the failure of the Californian government's attempts to establish MPAs in its state waters from 1998 to 2002 [51,52], the Florida Keys Marine Sanctuary [53], several MPAs in Southeast Asia [54] and Mafia Island in Tanzania [55]. Nevertheless, scholars have also noted that centralized management of coastal and marine resources could also work well under certain circumstances [5]. A case in point is the management of the Great Barrier Reef Marine Park (GBRMP), which represents a more adaptive approach [56–58]. Cultural Theory can help to explain why centralized, top-down management has both strengths and weaknesses and how it may be possible to exploit the former, while reducing the latter.

A centralized, top-down management regime is favoured by the hierarchical rationality (This is not to say that all facets of such regimes are necessarily hierarchical in practice. Rather, it is to assert that the attempts to put into place centralized, top-down MPAs have often relied on a hierarchical rationality). The typical management institution within this regime is the (central) government, which tends to employ a regulatory style of management. The objective is controllability of how, when and by whom the resources can be accessed. The preferred policy focuses on the functioning of the ecosystem and ensures the balance between short-term and long-term benefits. Policies that support limitation of access (gear, time, space and harvest) are favoured. In a hierarchical setting, marine resources tend to be perceived as available but within certain limits. Thus, the management regime focuses on ensuring that the limits are never crossed. Resource management employs experts to define these limits and then imposes statutory regulation to ensure that economic and social activities are bound by those limits. Any anthropogenic and natural disturbances can be assimilated as long as they do not reach critical levels. Resource scarcity becomes a problem of how to increase supply in order to meet the needs of people. Popular access to resources should be controlled. Creation of zoning systems that regulate access becomes a requirement. A stable supply of marine resources (e.g., fish) can be regarded as an appropriate measure of marine resource availability. However, the supply can be enlarged through an increase in the size and numbers of protected areas (the no-take zone). Ecosystem restoration, using the latest technology and the best available science, is considered as desirable. Alternative livelihood programs—via tourism or aquaculture—are highly recommended to limit the pressure in resources and to ensure proper functioning of the ecosystem.

Table 1. Four Ideal-Typical Ways of Organizing MPAs, According to Cultural Theory.

Variables	Hierarchy	Egalitarianism	Individualism	Fatalism/Despotism
Biodiversity/Resource value	Source for ecosystem stability	Source for human (group) well-being	Source for personal wealth and prosperity	Source for personal power
Biodiversity/Resource status and availability	Scarce but manageable	Depleted and unmanageable	Abundant and therefore manageable	Unknown
Biodiversity/Resource demand and scarcity	Needs are given, therefore supply has to be managed	It is a demand problem, as needs can be decreased	Demand is economically driven; thus, scarcity is a market problem	Needs are unmanageable desires; therefore, scarcity is individual problem
Biodiversity/Rights to use resources	Government to decide	Community to agree	Individually owned	Whoever has power
Biodiversity/Resource access and exploitation	Controlled	Strictly limited but equally accessible for the community	Unlimited	Get what you can, if you can
Management style	Regulatory, integrated	Preventative, communitarian	Adaptive, laissez-faire	Intimidating
Management institution	(Central) Government	Community-based	Private arrangement	Strongman rule
Management objective	Controllability	Sustainability	Exploitability	Gain at the expense of others
Management evaluation	Improvement of functional standard	Pristine wilderness and social equality	Economic value and growth, individual liberty	Focus to maintain (or expand) power
Role of science and Traditional Ecological Knowledge (TEK)	Western/modern science preferred	TEK preferred	Most efficient	No preference
Type of policy preferred	Focus on ecosystem functioning and balance between short-term and long-term benefits.	Focus on the community and the insurance of long-term benefits	Focus on individual economic benefit (“user pays” principle)	Personal, idiosyncratic rule
Process Design	Expert knowledge, government decision	Participatory, group decision	Individual decision	Secretive (backroom politics/lobbying)
Ideal scale	Large; cross-national and regional scale	Small; village or community scale	Most efficient	Most beneficial for the powers-that-be
Learning style	Anticipation	Mitigation (trial without error)	Adaptation (trial and error)	Opportunist, street-wise
Public involvement	Appropriately stratified	Active involvement of whole community	Whoever feels like it	No involvement

Table 1. *Cont.*

Variables	Hierarchy	Egalitarianism	Individualism	Fatalism/Despotism
Compliance	Imposed-compliance	Self-compliance	Compliance through the market system (e.g., fines)	Forced-compliance to the rivals in maintaining its power
Monitoring and Enforcement	Required, by government officers	Voluntary, by communities or collectively	If necessary	Required only to control the rival
Ecosystem restoration	Desirable, high-tech	Naturally, low-tech	Price driven	Only if beneficial
Gear, space, time and harvest restrictions	Required, limits are decided by experts	Strictly required if agreed by community	Undesirable	No preference; restriction to others, not self
Industrial activities (i.e., tourism and aquaculture activities) within the MPAs	Highly recommended; only when strictly regulated	Only if there is no impact, small scale	Desirable if cost-effective	Only if personally beneficial

Derived from Thompson, Ellis & Wildavsky [23], Tansey & Rayner [59] and Verweij [41].

The ideal spatial scale of MPA management is large and often crosses national and regional scales. The boundary is typically delineated according to ecological or political considerations. The style of learning from this regime is anticipatory, which means that possible outcomes from any activities have to be theoretically predicted. Monitoring, evaluation and enforcement are required and conducted by the government. This top-down, centralized approach presupposes that resource management should be exclusively performed by technical experts who are objective, rational and guided by the "best available science," rather than general people who are perceived by managers to be subjective and non-rational [60]. This management regime is applied to ensure that the control over resources is limited to the (central) government, as resources are robust only up to some limit. Therefore, it requires strict guidelines, proposed by experts, to sustain available resources. Such guidelines are typically categorized as forms of integrated management. The role of community is limited accordingly to ensure efficient resource allocation and imposed compliance becomes a main feature.

A Top-Down, Science-Driven Process: An Initial Failure of MPA Network Planning in California

This subsection provides a brief example of how a stringent top-down and linear, science-driven approach, implemented by the California Department of Fish and Game (DFG), failed to work in the earlier process of redesigning and expanding MPAs in California, through its Marine Life Protection Act (MLPA). The MLPA was enacted in 1999 as a response to public concerns over the declining health of ocean ecosystems and depletion of marine resources in California. The Act required the DFG to redesign and improve the system of MPA governance along the Californian coast [61,62]. Two initial efforts to implement the MLPA in 2000 and 2002 were unsuccessful in achieving the stated goals due to unclear objectives, a linear scientific approach, lack of citizen participation, insufficient funding and a shortage of administrative expertise [51,52,63].

The MLPA was initially advocated by a small group of stakeholders (called *policy entrepreneurs* by Weible [52]) in California, who were willing to pledge resources to promote a network of MPAs in the state. According to Weible [52], three factors motivated the entrepreneurs to set the stage for the MLPA: (a) a perceived problem of marine resource degradation and management; (b) a belief in MPA as an effective tool for ocean management; and (c) the view that they had the ability to change the present (marine) policy through a legislative process. Although the initial bill was struck down by a veto from California's governor Pete Wilson in 1998, the second effort to pass the law was successful in 1999. A year later, the first attempts to implement the Act were undertaken. Along with the mandate to redesign the MPA networks in California, the DFG was also tasked with creating a Master Plan Team. The team consisted exclusively of (natural) scientific experts and was created with the view to making a preliminary recommendation for the MPA placement sites. During the process, efforts to reach the public were very limited. Only one effort to solicit (specific) stakeholder feedback via mail survey was conducted early in 2001 but the feedback received was not taken into consideration by the Master Plan Team [52]. After approximately 15 months of work, in the summer of 2001, the DFG organized ten public meetings along the coast, at which it presented the recommendations from the Master Plan Team. The results were highly problematic for the DFG. Along with widespread citizen disappointment with the draft recommendations document—which was science based (extremely technical) and lacked stakeholder inputs—the public consultation processes were also ineffective. In response to these unintended results, the DFG abandoned the Master Plan Team and its recommendations in the winter of 2001 [63]. The second attempt to implement the MLPA was conducted the following summer. In this attempt, a more collaborative process, involving the Master Plan Team and affected stakeholders, was employed. However the process came to a halt in 2003, partially due to the then reigning financial crisis in California [63].

From a Cultural Theory point of view, it can be argued that the failure was primarily caused by the way this MPA was organized. From the brief case study, it is clear that the MPA was government centric and heavily dependent on the technical experts for deciding on the management plan. The lack

of active public involvement, which is the core of the egalitarian way of organizing, hampered the whole initiative.

4.2. Egalitarianism—Bottom-Up, Community-Based MPA Management

The bottom-up, community-based form of MPA governance is commonly employed in the tropics, such as in Southeast Asia, the Pacific and Africa (Under community-based MPA practices, we include locally managed marine areas (LLMAs)). It arose as a response to the perceived inadequacies of the resource management paradigm that was highly centralized (state-centric) and that often relied solely on science and required a lot of technical expertise [64,65]. The new form of MPA governance also benefited from discussions on the role of local communities in protected areas, as well as the role of science and local knowledge in the determination of objectives and policy planning [49,66,67].

Community-based MPAs are generally based on the premise that local communities have a greater interest in the sustainable use of the resources and have extensive knowledge of local resources and exploitation practices. Hence, it is likely that they will be more effective in managing access to resources through local arrangements [68]. Scholars have listed numerous benefits of community-based resource management, such as increasing local people's acceptance and participation, improvement of the local economy, as well as a deepening of democratization [69–71]. However, in places with long histories of state-centric policies, community-based resource management initiatives are likely to face important challenges [5], in particular in relation with their minimization of differences in resource managers' status and power. First, these MPAs often require public mobilization, which may not always be in constant supply. Furthermore, community-based MPAs typically require a high level of common interests and shared norms, which may also not prevail [49]. Finally, community-based MPAs sometimes fall prey to what Lane and Corbett [72] call "the tyranny of localism." According to this notion, (local) community-based decisions are not necessarily better or fairer. Indeed, these run the risk of magnifying inequalities and hindering democracy, if the operation of power relations at the local level is ignored.

A bottom-up, community-based management regime is the preference of the egalitarian rationality and can therefore be expected to include more egalitarian features than other types of MPAs. In an egalitarian setting, marine resources are perceived as fragile and intricately interconnected. Therefore, resources should only be used to fulfil people's basic needs. Moreover, members of the community (and only they) should have equal access to resources. The primary objective of this management form is sustainability–to ensure long-term resource benefits for future generations. The management regime emphasizes equal access and distribution, as well as the community's responsibilities with regard to its limited marine resources. The managing institution is typically the community itself. Its leader is often chosen on a voluntary basis, according to the level of willingness of a community member to invest his or her time and resources. The style of management is consensus-based and preventive. The evaluation of resource management is frequently benchmarked according to pristine environmental conditions and equal social benefits. Stable supply and free access to marine resources to all community members can be regarded as appropriate measures of marine resource availability. Any policies required to restrict access to and limit pressure on, resources can come into existence, only after agreement of the whole community. Due to the belief that marine resources are limited and fragile, any new activities and technologies (for instance, tourism, gear and aquaculture) can only be employed if there is no significant effect on the marine environment. The use of low-cost and small-scale technology for resource utilization and restoration is ideal. Local production and consumption are favoured. Monitoring and enforcement tend to be organized on a voluntary basis, usually by the community members. Typically, resources are managed for communal benefits in small social units, such as villages and tribes. The practice of community-based MPAs can usually be found in areas that have strong traditional and communal interactions, such as the Asia-Pacific islands [73–75].

Ecological Successes and Social Failures—A Tale of San Salvador CBMPA

This subsection provides a brief illustration of how, in San Salvador in the Philippines, interpersonal conflicts resulted in social disruption and thus undermined the commitment to communally manage an MPA. San Salvador Island is a 380 ha village island, located on the western coast of Luzon, the Philippines. The no-take San Salvador MPA was initiated in 1988 by the local community–led by *Lupong Tagapangasiwa ng Kapaligiran* (LTK), or the Environment Management Committee–in response to extensive illegal fishing activities and the lack of dedicated law enforcement staff. The MPA itself, which covers an area of 127 ha, was enacted in July 1989 through Masinloc Municipal Ordinance [76]. The community agreed to ban all fishing activities within the MPA. Additionally, they also set up and enforced a systemic sanction system, ranging from warnings and fines, to boat confiscation, depending on the severity of the violation. In the early phases of the MPA's development, the community received strong external support from both local and international institutions in the form of the Marine Conservation Project for San Salvador (MCPSS). During the ten years of its implementation, the ecological aspects–fish abundance, fish diversity and coral cover–seemed to be improving, yet the socio-economic aspects were weakening [54]. A political change in 1997 resulted in a conflict among MPA supporters, as the previous village head (who was still serving as the head of the municipality's warden's group for the MPA) was unwilling to coordinate enforcement efforts with his successor. Christie [54] argues that this interpersonal conflict between the two key supporters of the MPA was the primary reason for non-fulfilment of the socio-economic goals of the San Salvador MPA. But it can be argued that this personal conflict between two stakeholders was able to disrupt matters so significantly, due to the predominantly egalitarian mode in which the San Salvador MPA had been organized. As a result, it lacked, for example, the administrative rules and dispute settlement mechanisms that characterize the hierarchical way of organizing and that could have contained the conflict. In contrast, an egalitarian social setting is based on consensus among all participants and can therefore easily break down in the face of interpersonal conflict.

4.3. Individualism—EMPAs Management

The private sector also plays an important role in the management of coastal and marine resources. Their role in marine conservation is often captured by the term "entrepreneurial MPAs" (EMPAs) [77]. EMPAs are typically small in scale and supported commercially by private organizations or individuals [77,78]. Colwell has pointed out that the private sector (and dive resorts in particular) "which have a vested economic interest in promoting abundant marine life, can become the primary stewards of small-scale, commercially supported MPAs in coral reefs areas" [77] (p. 110). EMPAs arguably emerge from the inability of governments and local communities to exploit economic revenues from areas that have high potential economic value [77,79]. EMPAs have, for instance, been implemented on Tanzania's Chumbe Island [80], Malaysia's Sugud island [81], Vietnam's Hon Ong island [82] and Indonesia's Gili Trawangan island and in Pamuteran village [79].

Despite the ecological success of the EMPAs, great challenges remain to be addressed [80,82]. As Christie and White [5] have argued, private management of natural resources tends to create disputes as it is a centralized type of management, specifically for the resources that have previously been publicly owned. Thus, gaining support from local communities and governments, as well as possessing strong management and marketing strategies, are some important criteria to be fulfilled for any EMPA initiatives to be successful.

EMPA management is preferred by Cultural Theory's individualistic rationality and can therefore be expected to contain more individualistic traits as compared to other types of MPAs. According to this perspective, the management style of this regime has to be adaptable, private and laissez-faire. Hence, regulations need to remain conditional and negotiable. Moreover, policies are favoured that focus on short-term economic benefits and that maximize individual choice ("user-pays" principle). Limits on access to and exploitation of, resources are viewed as undesirable, as resources are perceived to be resilient—i.e., able to recover from any exploitation. Indeed, resources are deemed a source of personal

wealth and prosperity. Resource scarcity is seen as a market problem. Any activities of ecosystem restoration, tourism and aquaculture are considered desirable, as long as they are economically viable. Furthermore, the site selection of EMPAs has to be primarily market-based and profit-driven and not primarily derived from any conservation or other criteria [77,79]. MPA design should be mostly up to the individual investor, who should also have the right to decide on the level of investment in the MPA's management [80], as some of them have already served as a "de facto steward" for local marine resources [77]. Typically, public involvement in the management form is limited. EMPA coverage is decided at the most appropriate (or most efficient) scale. Additionally, monitoring and enforcement activities are only conducted as deemed necessary by individual investors.

Mind the Gap—Lessons from a Hotel Managed MPA in Vietnam

This subsection illustrates some potential problems of a strictly individualistic approach to an MPA. The lack of active community involvement and support may potentially create conflict and foster a law-breaking, self-serving attitude in the community, thus degrading the marine resources.

Whale Island Resort (WIR) was established in 1997 on a small island (100 ha) in Vha Phong Bay, Khanh Hoa Province, in south-central Vietnam. As a response to the declining fish population and coral cover, due to illegal fishing activities, increasing solid waste pollution from nearby villages and growing numbers of fishing vessels, the owner of the resort took the initiative to outline an MPA for some parts of the island [82,83]. In 2001, they managed to lease a larger area (including coastal waters) from the provincial authorities for a ten year-period. This eventually became an EMPA area (named Whale Island Bay Reserve). The MPA boundaries were marked by the local coastguard using buoys that covered around 11 ha of the area. Moreover, in 2005, the owner decided to enclose another bay in the peninsula (opposite to the older MPA and the resort) to create an additional MPA of 5 ha, entitled Whale Island Bay Peninsula Reserve [82]. Svensson et al. [82] emphasize that the total cost to maintain the MPAs was relatively low, at about USD 10,000 per year, including the (sea) portion of the lease, the wardens' salaries and other maintenance costs. Although local community members acquiesced in the initial effort by the resort to establish an MPA, most of them did not agree with later processes [83]. In the first few years, fish poaching inside the MPA was a frequent occurrence. To ensure compliance, local coast guards were contacted on a regular basis to convey warnings and confiscate the fishing gear of regular offenders. Consequently, poaching activities in the first MPA saw a reduction due to frequent patrol by the wardens. However, the opposite was true for the second MPA [82]. The phenomenon of *fishing the line* (fishing just on the MPA borders) during night-time arose through the use of extractive fishing gear (fishing nets rather than hook and line) [82,83].

The case study shows an example of an MPA that was organized in a more individualistic way. The MPA was initiated and managed by a commercial actor, the resort. It was clear that most of the management activities were designed to ensure the benefits to that individual actor. No public engagement activities were conducted to obtain local support for the MPA. Therefore, frequent (illegal) poaching happened at times when there were no MPA wardens active.

4.4. Fatalism—Mismanaged (or Paper Park) MPAs

Fatalism (or despotism) is associated with opportunistic (mismanaged) MPAs. Typically, holders of fatalistic rationality use MPAs as a means to enhance their individual power, both financially and socially. The value of a resource in this type of MPA is solely interpreted in terms of individual survival, even at the expense of others. The overall condition of a resource is not of concern, as the demand for resources is perceived to be unmanageable anyway. Typically, this particular management regime resembles a fiefdom, i.e., a personalized, top-down approach in order to maintain established privileges. The style of management is conservative and intimidating, which is oriented to accommodate the needs of particular, powerful individuals. Management evaluations are not favoured and are only conducted to maintain the relative power of interested individuals. The roles of either western or local knowledge are often not prominent in this type of management. Likewise,

the design process and scale of the area are to be decided secretively and usually, haphazardly. Public involvement is not highly valued and compliance is enforced. Monitoring is conducted only for the sake of maintaining power.

A "Perfect" Park—Community Displacement at the Bijágos Archipelago, Guinea-Bissau

This subsection aims to provide an illustration of an opportunistically organized MPA (or, in terms of Cultural Theory, a fatalistic or despotic one). In this setting, different stakeholders pursued their own interests at the expense of other people's needs. It resulted in corruption, local conflicts among the stakeholders, little compliance and ultimately resource degradation.

The Bijágos Archipelago is located in the Atlantic Ocean off the coast of Guinea-Bissau. It consists of about 88 islands and islets, only 20 of which are populated year-round. It has a rich marine and coastal biodiversity, including mangrove forests, sea turtles, marine mammals and other protected species [84,85]. Prior to 1980, fishing was primarily conducted by local people in the Bijágos Archipelago, as a subsistence activity during the off-farming season [86]. Later on, fishing in the area also began to involve people from the mainland (i.e., the Nhominka), who had different objectives and interests compared to the indigenous islanders [87]. These mainlanders migrated seasonally and set up temporary camps on the coasts of the islands. These camps were later expanded and became permanent settlements of migrant people.

In 1996, due to the richness of its resources and its unique local culture, the islands were designated as a UNESCO Biosphere Reserve. Following this, in 2000, two (marine) national parks, the National Marine Park of João Vieira Poilão (NMP—JVP) and the Orango National Park (PNO), were established [87]. Only in 2014, the International Union for Conservation of Nature (IUCN) and the governmental agencies of Guinea-Bissau created an Institute for Biodiversity and Protected Area (IBAP), whose function is to manage the parks. According to Cross [87] (p. 695), "the protection agenda coincided with a move to rein in small-scale fishing," as fishing activities, particularly from the migrant people, had become identified as a potential threat to other marine megafauna. Furthermore, armed parks' officials forcibly chased out the migrant fishers and destroyed their settlements within the parks' areas, as the park rules came into force. In order to cope with the eviction, the migrant fishers moved to the nearby areas, where the local inhabitants lived, so as to continue their livelihood. However, their movement faced resistance from the local inhabitants and thus horizontal conflicts started to emerge [87]. Following the conflicts, the state government finally tried to solve the situation by monitoring the migrant fishing camps and their fishing activities. The state government enforced a strict regulation involving different type of permits (identity papers, boat licenses, fishing permits, etc.) Due to these excessive rules, the migrants have started to employ various law-breaking strategies. Among the local inhabitants, these actions have resulted in a split between those supporting and those rejecting, the state intervention. In addition local communities have complained about the corrupt and fraudulent behaviour of government officials and migrant fishers [87].

From a Cultural Theory perspective, this MPA was predominantly organized in a fatalistic manner, as most (if not all) actors tried to get ahead at the expense of others. The lack of active participation and equal treatment of the public (i.e., the egalitarian way of organizing), the absence of effectively enforced laws (provided by the hierarchical way of organizing) and a dearth of clearly established, individual ownership rights (part and parcel of the individualistic way or organizing) were at the heart of the conflicts that prevailed in the Bijágos Archipelago.

The above case studies illustrate Cultural Theory's proposition that monolithically organized MPAs will fail to achieve environmental sustainability regardless of the form that this uniformity has taken (centrally managed, community-based or entrepreneurial). In the next section, we argue that the approach also has implications for our understanding of when and why a more hybrid version of MPAs can succeed.

5. Co-Management as a Messy Management Regime

One of the most lauded approaches in governing natural resources is collaborative management or co-management [88]. It has emerged as an alternative for the continued divergence between the top-down, state-centric style of MPA management and the bottom-up community-based style [89–91]. Co-management is generally defined as a management approach that involves the sharing of power and responsibility, usually between the government and the community, in the form of an equitable partnership to achieve goals in managing a resource or an area [88,92]. It promotes "formal" collaboration and encourages positive communication between the resource users and the government. Carlsson and Berkes [92] summarize the characteristics underpinning co-management concepts and definitions in the literatures as follows: (1) typically associated with the natural resource management concept; (2) a form of partnership between the government, the public and the private actors; and (3) an ever changing, dynamic process.

The earliest use of the term "co-management" can be traced back to salmon fisheries management in the state of Washington in the late 1970s [93]. In its early development, scholars had only seen it as a simple partnership arrangement between the government and the local resource users in managing resources that had emerged as an alternative to bridge the gap between a purely state-centric, centralized type of management and a purely community based type of management [89–92]. However, recent developments in the literature show that co-management has become a more dynamic and complex arrangement and covers multidimensional aspects of the management process, specifically in its role as a bridging institution, in knowledge generation, in social learning and in adaptive management [88].

In terms of Cultural Theory, a co-management approach can be the potential "messy" institution that helps to combine the four basic governance regimes distinguished in the approach. In a co-management setting, hierarchical, egalitarian, individualistic and fatalistic ways of perceiving and organizing are being mixed and combined. For instance, hierarchical actors (in some cases, the government) may see co-management as an opportunity to enhance initial acceptance from the wider community, to improve compliance and to ensure diversity in innovations to finance the MPAs. Individualistic actors may perceive co-management as representing new opportunities for expanding their businesses and achieving more profit, for example in tourism or sectors of aquaculture. The egalitarian-minded (typically, the local community) could feel that they finally have a significant role in deciding what to do in order to reduce inequality according to their local wisdom and needs. In the co-management MPA setting, divergent needs of multiple stakeholders are therefore accommodated and conflicting interests may possibly be minimized. Multiple uses through zoning of MPAs can then become viable (e.g., different zones for traditional use, tourism, reserves, education and fisheries). Typically, the goals of the MPAs are not solely to protect resources but also to improve local capacity and livelihoods. On these grounds, Cultural Theory predicts that, as a messy MPA, co-management should enable stakeholders to generate clumsy solutions more successfully than approaches that are closer to monolithic MPAs. Typically, this is because clumsy solutions are dynamic solutions based on the recognition that policy efforts need to be as pluralist as the current environmental and social problems [11,12]. Figure 2 provides an illustration of how clumsy solutions emerge from clashing, combining and accommodating four different MPA regimes.

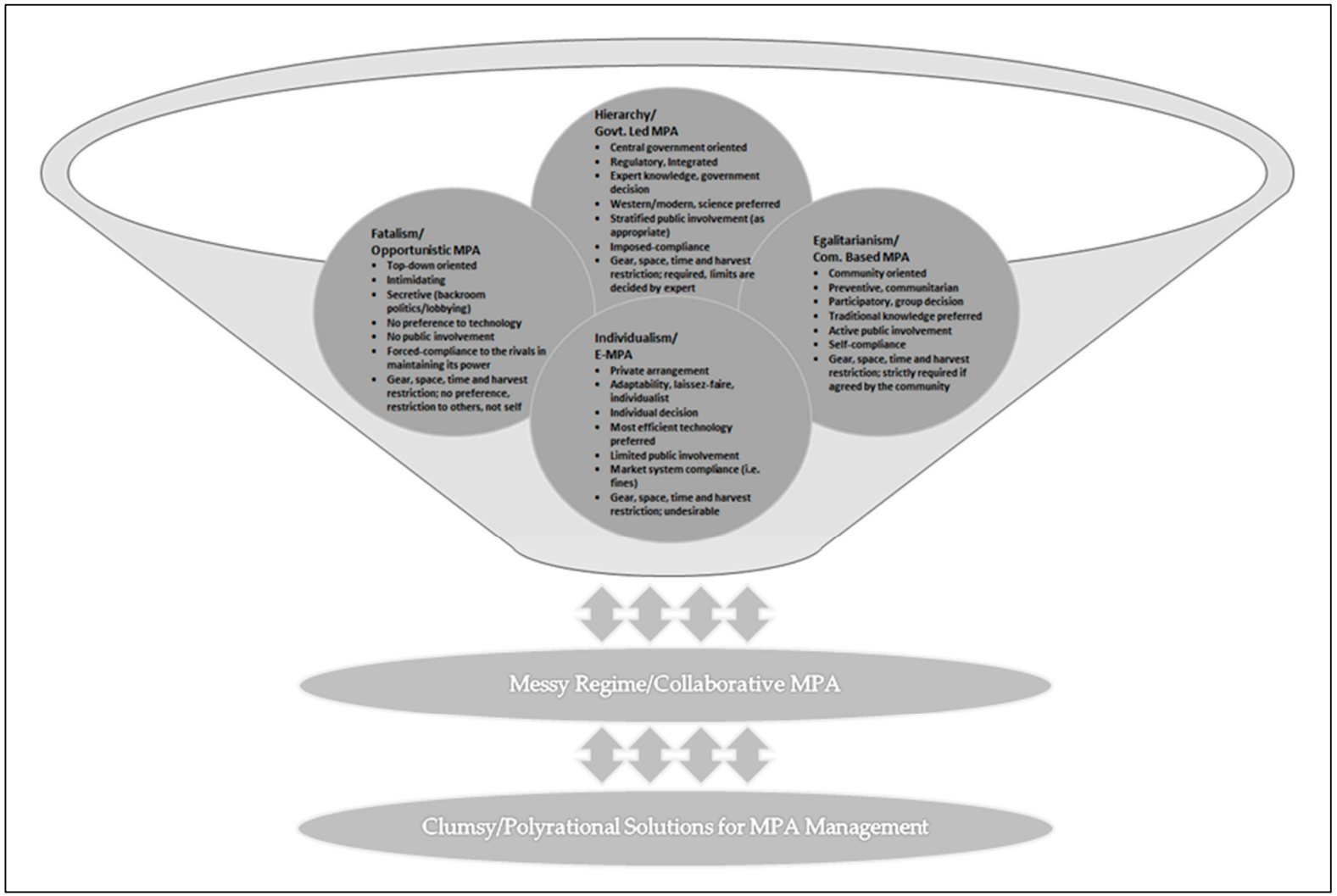

Figure 2. MPA Governance According to Cultural Theory: Messy Institutions and Clumsy Solutions.

5.1. A Dynamic Collaborative Governance—Tubbataha Reefs Natural Park (TRNP)

In this sub-section, we highlight how a messy MPA regime, the Tubbataha Reefs Natural Park (TRNP), enabled the emergence of a more effective and widely endorsed, indeed clumsy, management solution. Initiated as a strictly hierarchical approach, the management process led to major conflicts among stakeholders. However, after a significant transformation in late 1990s, in which all of the conflicting stakeholders were consulted and involved, the MPA became more acceptable to the public.

Nestled in the middle of the Sulu Sea, on the southwest corner of the Philippines, Tubbataha reefs constitute the largest coral reef atoll in the country. It was the richness of the natural resources in the area that made scientists, governmental agencies, NGOs, private industries and local people take a keen interest in participating in the area's management. Since the beginning of the 1980s, the area has been an important fishing zone and scuba diving destination for both locals and foreigners. However, as early as in 1989, the reef had sustained heavy damages due to illegal activities such as fish bombing and poisoning, wildlife collections and dropping anchors from boats [94,95].

Addressing the complex issues in Tubbataha reefs, in August 1988, a Presidential Decree created the Tubbataha Reefs Natural Park (TRNP). The TRNP covered about 97.030 ha and was the country's first national marine park. The vision of the TRNP was to effectively conserve the area to maintain ecological integrity, to contribute to the equitable distribution of benefits to all stakeholders and to sustain socio-economic development for present and future generations. The Tubbataha Protected Area Management Board (TPAMB)–consisting of 20 member institutions–was responsible for devising future policies, while daily operations were to be handled by the Tubbataha Management Office.

In total, seven categories of stakeholders have been involved in the TRNP: national government agencies, local government units, regional governmental units at provincial level, fishing operators, private industries (dive tour operators), NGOs, research institutions and non-user people [96]. These stakeholders have employed a variety of ways of perceiving, justifying and solving the problems at hand. We would argue that the prime reason for the success of the TRNP has been the ability to incorporate all these competing rationalities into its management regime. The accommodation of all competing rationalities was reflected in both its management plan and the structure of the TRNP's governing body.

5.1.1. A Brief History of TRNP

The history of the TRNP management regime is one of a very complex, yet adaptive process. In 1989–1990, the first draft of the management plans was released based on limited information and sporadic monitoring and enforcement were conducted [97]. In the period from 1991 to 1994, research expeditions were conducted, the management plan was re-drafted, the park became a UNESCO world heritage site and the Navy was mandated to guard it. In the next three years, multiple local, regional and international institutions worked together to implement a management plan, under the Presidential Task Force, chaired by the secretary of the Department of Environment and Natural Resources (DENR). The TPAMB was formed from 1998 to 1999, as a result of a series of workshops involving multiple stakeholders. Soon after, a park manager was appointed and the PAMB became operational. An entrance fee to the park was initiated in the same year, based on a study by WWF and the Coastal Resource Management Project (CRMP) analysing the willingness of consumers to pay for the service. From 2000 to 2002, the Tubbataha Management Office was established, regular monitoring and research were conducted and livelihood programs were launched, including the implementation of entrance fees and a permit. The management plan was again revised in 2004 to incorporate a park effectiveness assessment, as well as a monitoring and evaluation program, while the park's boundaries were expanded [94,95,97]. In 2011, a new update of the management plan that aimed to balance the legal, economic and participative incentives was implemented and approved by the TPAMB [98].

5.1.2. Competing Rationalities

Hierarchical actors in this MPA, including the Department of Environment and Natural Resources and other central government agencies, saw the overt exercise of the freedom of the community to act beyond their suppositions as a problem. For instance, fishermen can fish as much as they want and even use illegal tools; seaweed operators can claim the area for their farms, dive operators can compete to bring as many tourists as possible to the area. Hierarchical stakeholders perceived that those activities could act as a potential threat to the integration of the community as a whole and thus, structured centralized management was required. This was fortified by their view of nature, according to which ecosystems are robust but only up to a point. Therefore, in their view, establishing limits to resource utilization was urgently needed to ensure the stability of the ecosystem.

Egalitarian stakeholders and especially local communities (It may be surmised that NGOs are typically more egalitarian than other actors. But according to Cultural Theory [21], NGOs can take on many shapes—from highly egalitarian (e.g., Earth First!), via rather hierarchical (such as The Sierra Club) and individualistic (The Adam Smith Institute), to fatalistic—and any combination thereof. As such, NGOs are not necessarily different from any other organizations (although Cultural Theory expects that, overall, NGOs tend to include more egalitarian features than other types of actors)), saw the extractive use of resources and the inequality of the early management processes of the TRNP as key problems. Local communities were not involved in early planning but they faced direct consequences as soon as the ban on any extractive activities was implemented. Egalitarian actors demanded equal representation in decision-making, rule enforcement, as well as a share of the benefits as the solution to the problem of the Tubbataha reef conservation [95].

Individualistic actors, such as fishing and tourism operators, believe in the resilience of ecosystems and therefore they did not acknowledge that the utilization of resources was causing many problems. They perceived the problem as arising from government intervention in the private management of resources in the TRNP. Fishing operators did not agree with the ban on extractive activities since it limits their fishing grounds and consequently impacts their income. Meanwhile, dive tour operators saw this as a potential opportunity to keep their business running without additional investments to ensure the reefs remained healthy.

Fatalistic actors (some overseas poachers/fishers and local government units) usually do not have an opinion on the possible environmental consequences of intensified resource extraction. Rather, the issue of resource extraction is seen as an opportunity to maintain, or strengthen, their power. Hence, in this particular case, fatalists perceived the TRNP as a problem. With its implementation, some local government units lost the power that they used to have, as the management jurisdiction of the area fell upon different people and institutions, while the access for overseas fishers to catch fish and other commercial species became limited.

5.1.3. The Emergence of a Clumsy Solution

The year 1999 saw a turning point in the ineffective, early management strategies with the formation of the TPAMB, a multi-stakeholder body that directed the management of the TRNP, representing various interests in the Tubbataha reefs area. Following the establishment of the TPAMB, the management plan of the TRNP, based on the stakeholder agreements from a multi-stakeholder workshop, was also endorsed. Despite intense discussions and contradictory exchanges during the workshop, all participants accepted the end result. An unexpected position was taken by the representatives of fishing operators during the workshop. They agreed to support the MPA area, after understanding the potential "spill-over" benefits from the no-take area to the adjacent fisheries. The summary of the agreement reads as follows [95] (p. 57): (Note that (1) Cagayancillo is the nearest community settlement to the TRNP; it is within Palawan Province of the Philippines; (2) The bill was finally enacted in 2009 (known as TRNP Act of 2009)).

1. *Cagayancillo fishers to respect the no-take zone area.*
2. *Commercial and Palawan fishers to respect the no-take zone.*
3. *Divers and dive operators to pay user fees.*
4. *7% share from user fees allocated to Cagayancillo.*
5. *PCSD to draft bill and authorize pilot collection of user fees.*
6. *PAMB to establish a Tubbataha Management Office.*
7. *Phil Navy and Coast Guard to establish and staff a ranger station.*

Since then, the management plan has been reviewed and updated a number of times but the features of the agreements remain, more or less, the same.

Interestingly, the management plan was acceptable and when implemented, beneficial to all stakeholders. Hierarchical actors have benefitted from improved compliance, ecosystem stability and control of the community. For egalitarian stakeholders, the benefits have mostly been the improvement of local participation in management and the amelioration of local livelihoods via the sharing of user fees [94]. The benefits to individualistic stakeholders have come from ensuring the continuation of their business operations and the spill over effects. Although it is difficult to pinpoint the benefits to fatalists; in this case, with the implementation of the TRMP management plan, they could start to think about the strategies they could implement to get back the power they used to have.

6. Concluding Remarks

This paper has illustrated that Cultural Theory provides a helpful theoretical underpinning with which to understand the current discourses about how to structure and implement MPA governance regimes. Each of Cultural Theory's rationalities adequately captures a well-known type of MPA governance. Top-down, centralized management is based on its hierarchical rationality, bottom-up community-based management is informed by its egalitarian rationality, entrepreneurship management represents the individualistic rationality, while paper parks often embody the fatalistic way of life. The recent approach of co-management is a messy institution as it combines all the four ways of organizing and perceiving set out in Cultural Theory. As such, it typically involves negotiations between various stakeholders.

As explained above, there are three contributions that Cultural Theory has, in principle, to offer to the study and practice of MPA governance. The first of these concerns the theory's ability to function as a simple, yet comprehensive, heuristic model for understanding different behaviours and perceptions of individual and collective actors in a socio-ecological system. For instance, this helps to identify fatalistic actors and ways of organizing, which are often overlooked but which are nevertheless important. This feature can help to strengthen the commonly used technique of stakeholder analysis. As Billgren & Holmén [99] have argued, stakeholder analyses often identify the key stakeholders without understanding why these behave the way they do. The second contribution lies in its hypothesis that clumsy or polyrational solutions can protect ecosystems in an effective and widely accepted manner. This hypothesis has received wide empirical support outside the study of MPA governance and should therefore also be tested within it. The third contribution pertains to the question of how to organize MPA governance. While recognizing a suitable management approach, namely co-management, the existing literature has typically only recommended governmental, community-based and private management regimes as essential components of co-management. Cultural Theory deepens this analysis by highlighting a fourth type of regime (the fatalistic one), by spelling out many of the perceptions and beliefs accompanying these different ways of organizing and by elucidating why mixed regime types can function better. We do not claim that all MPAs have to be co-managed in the same manner but we assert the importance of accounting for other management regime attributes in order to achieve sustainable MPAs in a collaborative setting. Moreover, depending on the peculiarities of the social interactions in a particular MPA, any of the four management regimes may take a (provisional) dominant role in a mixed, collaborative, regime. In order to corroborate the

arguments made in this paper, it would be important to undertake systematic empirical studies of MPAs around the world. This would entail classifying existing MPAs according to Cultural Theory's categories with a view to assessing whether MPAs that follow a single way of organizing are failing and whether those that combine ways of organizing are succeeding. We hope that this research will serve as a good starting point for such future endeavours.

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References

1. Morin Dalton, T. An approach for integrating economic impact analysis into the evaluation of potential marine protected area sites. *J. Environ. Manag.* **2004**, *70*, 333–349. [CrossRef] [PubMed]
2. McClanahan, T.R.; Marnane, M.J.; Cinner, J.E.; Kiene, W.E. A comparison of marine protected areas and alternative approaches to coral-reef management. *Curr. Biol.* **2006**, *16*, 1408–1413. [CrossRef] [PubMed]
3. National Research Council. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystem*; The National Academies Press: Washington, DC, USA, 2001.
4. Mascia, M.B. The human dimension of coral reef marine protected areas: Recent social science research and its policy implications. *Conserv. Biol.* **2003**, *17*, 630–632. [CrossRef]
5. Christie, P.; White, A.T. Best practices for improved governance of coral reef marine protected areas. *Coral Reefs* **2007**, *26*, 1047–1056. [CrossRef]
6. Bambridge, T.; D'Arcy, P. Large-scale marine protected areas in the Pacific: Cultural and social perspectives. In *Gouvernance, Enjeux et Mondialisation des Grandes Aires Marines Protégées*; Féral, F., Salvat, B., Eds.; Recherche sur les Politiques Environnementales de Zonage Maritime, Le Challenge Maritime de la France de Méditerranée et d'Outre-mer; Harmattan: Paris, France, 2014; pp. 113–132.
7. Schlüter, A.; Wise, S.; Schwerdtner Mánez, K.; de Morais, G.W.; Glaser, M. Institutional change, sustainability and the sea. *Sustainability* **2013**, *5*, 5373–5390. [CrossRef]
8. De Morais, G.W.; Schlüter, A.; Verweij, M. Can institutional change theories contribute to the understanding of marine protected areas? *Glob. Environ. Chang.* **2015**, *31*, 154–162. [CrossRef]
9. Juda, L. Considerations in Developing a Functional Approach to the Governance of Large Marine Ecosystems. *Ocean Dev. Int. Law* **1999**, *30*, 89–125. [CrossRef]
10. Lemos, M.C.; Agrawal, A. Environmental governance. *Annu. Rev. Environ. Resour.* **2006**, *31*, 297–325. [CrossRef]
11. Ney, S.; Verweij, M. Exploring the Contributions of Cultural Theory for Improving Public Deliberation about Complex Policy Problems. *Policy Stud. J.* **2014**, *42*, 620–643. [CrossRef]
12. Ney, S.; Verweij, M. Messy institutions for wicked problems: How to generate clumsy solutions? *Environ. Plan. C Gov. Policy* **2015**, *33*, 1679–1696. [CrossRef]
13. Frame, B. Wicked', messy', and clumsy': Long-term frameworks for sustainability. *Environ. Plan. C Gov. Policy* **2008**, *26*, 1113–1128. [CrossRef]
14. Stahl, C.; Cimorelli, A. A demonstration of the necessity and feasibility of using a clumsy decision analytic approach on wicked environmental problems. *Integr. Environ. Assess. Manag.* **2013**, *9*, 17–30. [CrossRef] [PubMed]
15. Ban, N.C.; Cinner, J.E.; Adams, V.M.; Mills, M.; Almany, G.R.; Ban, S.S.; White, A. Recasting shortfalls of marine protected areas as opportunities through adaptive management. *Aquat. Conserv. Mar. Freshw. Ecosyst.* **2012**, *22*, 262–271. [CrossRef]

16. Bruggemann, J.H.; Rodier, M.; Guillaume, M.M.M.; Andréfouët, S.; Arfi, R.; Cinner, J.E.; Pichon, M.; Ramahatratra, F.; Rasoamanendrika, F.; Zinke, J.; et al. Wicked social–ecological problems forcing unprecedented change on the latitudinal margins of coral reefs: The case of southwest Madagascar. *Ecol. Soc.* **2012**, *17*, 47. [CrossRef]
17. Diedrich, A.; Tintoré, J. Multi-Method Approach to Exploring Social–Ecological Dimensions in a Mediterranean Suburban Beach Setting. *Coast. Manag.* **2012**, *40*, 301–311. [CrossRef]
18. Ackoff, R.L. *Systems, Messes, and Interactive Planning*; Portions of Chapters I and 2 of Redesigning the Future; Wiley: New York, NY, USA; London, UK, 1974.
19. Douglas, M. *Natural Symbols: Explorations in Cosmology*; Barrie and Rockliff: London, UK, 1970.
20. Douglas, M. *Cultural Bias*; Royal Anthropological Institute London: London, UK, 1978.
21. Douglas, M.; Wildavsky, A. *Risk and Culture: An Essay on the Selection of Technical and Environmental Danger*; University of California Press: Berkeley, CA, USA, 1982.
22. Wildavsky, A. Choosing preferences by constructing institutions: A cultural theory of preference formation. *Am. Political Sci. Rev.* **1987**, *81*, 3–22. [CrossRef]
23. Thompson, M.; Ellis, R.; Wildavsky, A. *Cultural Theory*; Westview Press: Boulder, CO, USA, 1990.
24. Schwarz, M.; Thompson, M. *Divided We Stand: Re-Defining Politics, Technology and Social Choice*; University of Pennsylvania Press: Philadelphia, PA, USA, 1990.
25. Forsyth, T. Mountain myths revisited: Integrating natural and social environmental science. *Mt. Res. Dev.* **1998**, *18*, 107–116. [CrossRef]
26. Holling, C.S. Myths of ecological stability: Resilience and the problem of failure. In *Studies in Crisis Management*; Smart, C.F., Stanbury, W.T., Eds.; Butterworth: Montreal, QC, Canada, 1978; pp. 97–109.
27. Mamadouh, V. Grid-group cultural theory: An introduction. *GeoJournal* **1999**, *47*, 395–409. [CrossRef]
28. Coyle, D.J. The theory that would be king. In *Politics, Policy & Culture*; Coyle, D.J., Ellis, R.J., Eds.; Westview Press: Boulder, CO, USA, 1994; pp. 219–239.
29. Verweij, M.; Douglas, M.; Ellis, R.; Engel, C.; Hendriks, F.; Lohmann, S.; Ney, S.; Rayner, S.; Thompson, M. Clumsy solutions for a complex world: The case of climate change. *Public Adm.* **2006**, *84*, 817–843. [CrossRef]
30. Verweij, M.; Thompson, M. *Clumsy Solutions for a Complex World: Governance, Politics and Plural Perceptions*; Palgrave Macmillan: Basingstoke, UK, 2006.
31. Verweij, M.; Douglas, M.; Ellis, R.; Engel, C.; Hendriks, F.; Lohmann, S.; Ney, S.; Rayner, S.; Thompson, M. The Case for Clumsiness. In *Clumsy Solutions for a Complex World*; Verweij, M., Thompson, M., Eds.; Pelgrave Macmillan: Basingstoke, UK, 2006; pp. 1–27.
32. Hartmann, T. Wicked problems and clumsy solutions: Planning as expectation management. *Plan. Theory* **2012**, *11*, 242–256. [CrossRef]
33. Lockhart, C.; Franzwa, G. Cultural theory and the problem of moral relativism. In *Poltics, Policy and Culture*; Coyle, D.J., Ellis, R.J., Eds.; Westview: Boulder, CO, USA, 1994; pp. 175–189.
34. Sunstein, C.R. Incompletely Theorized Agreements. *Harv. Law Rev.* **1995**, *108*, 1733–1772. [CrossRef]
35. Rawls, J. The Idea of an Overlapping Consensus. *Oxf. J. Leg. Stud.* **1987**, *7*, 1–25. [CrossRef]
36. Rayner, S. Management of Radiation Hazards in Hospitals: Plural Rationalities in a Single Institution. *Soc. Stud. Sci.* **1986**, *16*, 573–591. [CrossRef]
37. Ney, S. *Resolving Messy Policy Problems: Handling Conflict in Environmental, Transport, Health and Ageing Policy*; Earthscan: Abingdon, UK, 2009.
38. Thompson, M. Clumsy solutions to environmental change. In *A Changing Environment for Human Security: Transformative Approaches to Research, Policy and Action*; Sygna, L., O'Brien, K., Wolf, J., Eds.; Routledge: London, UK, 2013; pp. 424–432.
39. Gyawali, D.; Thompson, M.; Verweij, M. (Eds.) *Aid, Technology and Development: The Lessons from Nepal*; Routledge: Abingdon, UK, 2017.
40. Scolobig, A.; Thompson, M.; Linnerooth-Bayer, J. Compromise not consensus: Designing a participatory process for landslide risk mitigation. *Nat. Hazards* **2016**, *81*, 45–68. [CrossRef]
41. Verweij, M. *Clumsy Solutions for a Wicked World: How to Improve Global Governance*; Palgrave Macmillan: Basingstoke, UK, 2011.
42. Singleton, B.E. Clumsiness and elegance in environmental management: Applying cultural theory to the history of whaling. *Environ. Politics* **2016**, *25*, 414–433. [CrossRef]

43. Khan, A.S.; Neis, B. The rebuilding imperative in fisheries: Clumsy solutions for a wicked problem? *Prog. Oceanogr.* **2010**, *87*, 347–356. [CrossRef]
44. Charbonneau, A. Integrated Coastal Management: 'Wicked' Problems and 'Clumsy' Solutions. *Arbutus Rev.* **2012**, *3*, 23–36.
45. Foale, S.; Dyer, M.; Kinch, J. The value of tropical biodiversity in rural Melanesia. *Valuat. Stud.* **2016**, *4*, 11–39. [CrossRef]
46. Phillips, A. Turning ideas on their head. *George Wright Forum* **2003**, *20*, 8–32.
47. McCrea-Strub, A.; Zeller, D.; Rashid Sumaila, U.; Nelson, J.; Balmford, A.; Pauly, D. Understanding the cost of establishing marine protected areas. *Mar. Policy* **2011**, *35*, 1–9. [CrossRef]
48. Wilhelm, T.A.; Sheppard, C.R.C.; Sheppard, A.L.S.; Gaymer, C.F.; Parks, J.; Wagner, D.; Lewis, N.A. Large marine protected areas—Advantages and challenges of going big. *Aquat. Conserv. Mar. Freshw. Ecosyst.* **2014**, *24*, 24–30. [CrossRef]
49. Agrawal, A.; Gibson, C.C. Enchantment and disenchantment: The role of community in natural resource conservation. *World Dev.* **1999**, *27*, 629–649. [CrossRef]
50. Acheson, J.M. Institutional failure in resource management. *Annu. Rev. Anthropol.* **2006**, *35*, 117–134. [CrossRef]
51. Helvey, M. Seeking consensus on designing marine protected areas: Keeping the fishing community engaged. *Coast. Manag.* **2004**, *32*, 173–190. [CrossRef]
52. Weible, C.M. Caught in a maelstrom: Implementing California marine protected areas. *Coast. Manag.* **2008**, *36*, 350–373. [CrossRef]
53. Suman, D.; Shivlani, M.; Walter Milon, J. Perceptions and attitudes regarding marine reserves: A comparison of stakeholder groups in the Florida Keys National Marine Sanctuary. *Ocean Coast. Manag.* **1999**, *42*, 1019–1040. [CrossRef]
54. Christie, P. Marine protected areas as biological successes and social failures in Southeast Asia. In *Aquatic Protected Areas as Fisheries Management Tools: Design, Use, and Evaluation of These Fully Protected Areas*; Shipley, J.B., Ed.; American Fisheries Society: Bethesda, MD, USA, 2004; pp. 155–164.
55. Walley, C.J. *Rough Waters: Nature and Development in an East African Marine Park*; Princeton University Press: Princeton, NJ, USA, 2010.
56. Day, J.C. Zoning—Lessons from the Great Barrier Reef marine park. *Ocean Coast. Manag.* **2002**, *45*, 139–156. [CrossRef]
57. Fernandes, L.; Day, J.; Lewis, A.; Slegers, S.; Kerrigan, B.; Breen, D.; Cameron, D.F.; Jago, B.; Hall, J.; Lowe, D.; et al. Establishing Representative No-Take Areas in the Great Barrier Reef: Large-Scale Implementation of Theory on Marine Protected Areas. *Conserv. Biol.* **2005**, *19*, 1733–1744. [CrossRef]
58. McCook, L.J.; Ayling, T.; Cappo, M.; Choat, J.H.; Evans, R.D.; De Freitas, D.M.; Heupel, M.; Hughes, T.P.; Jones, G.P.; Mapstone, B. Adaptive management of the Great Barrier Reef: A globally significant demonstration of the benefits of networks of marine reserves. *Proc. Natl. Acad. Sci. USA* **2010**, *107*, 18278–18285. [CrossRef] [PubMed]
59. Tansey, J.; Rayner, S. Cultural theory and risk. In *Handbook of Risk and Crisis Communication*; Heath, R.L., O'Hair, D.H., Eds.; Routledge: London, UK, 2009; pp. 53–79.
60. Smith, J.L. A critical appreciation of the "bottom-up" approach to sustainable water management: Embracing complexity rather than desirability. *Local Environ.* **2008**, *13*, 353–366. [CrossRef]
61. Gleason, M.; McCreary, S.; Miller-Henson, M.; Ugoretz, J.; Fox, E.; Merrifield, M.; McClintock, W.; Serpa, P.; Hoffman, K. Science-based and stakeholder-driven marine protected area network planning: A successful case study from north central California. *Ocean Coast. Manag.* **2010**, *53*, 52–68. [CrossRef]
62. Kirlin, J.; Caldwell, M.; Gleason, M.; Weber, M.; Ugoretz, J.; Fox, E.; Miller-Henson, M. California's Marine Life Protection Act Initiative: Supporting implementation of legislation establishing a statewide network of marine protected areas. *Ocean Coast. Manag.* **2013**, *74*, 3–13. [CrossRef]
63. Weible, C.M.; Sabatier, P.A.; Lubell, M. A Comparison of a Collaborative and Top-Down Approach to the Use of Science in Policy: Establishing Marine Protected Areas in California. *Policy Stud. J.* **2004**, *32*, 187–207. [CrossRef]
64. Armitage, D. Adaptive capacity and community-based natural resource management. *Environ. Manag.* **2005**, *35*, 703–715. [CrossRef] [PubMed]

65. Berkes, F. From community-based resource management to complex systems: The scale issue and marine commons. *Ecol. Soc.* **2006**, *11*, 45. [CrossRef]
66. Gadgil, M.; Berkes, F.; Folke, C. Indigenous knowledge for biodiversity conservation. *Ambio* **1993**, *22*, 151–156.
67. Gerhardinger, L.C.; Godoy, E.A.; Jones, P.J. Local ecological knowledge and the management of marine protected areas in Brazil. *Ocean Coast. Manag.* **2009**, *52*, 154–165. [CrossRef]
68. Thorburn, C.C. Changing Customary Marine Resource Management Practice and Institutions: The Case of Sasi Lola in the Kei Islands, Indonesia. *World Dev.* **2000**, *28*, 1461–1479. [CrossRef]
69. Christie, P.; White, A.; Deguit, E. Starting point or solution? Community-based marine protected areas in the Philippines. *J. Environ. Manag.* **2002**, *66*, 441–454. [CrossRef]
70. Blaikie, P. Is small really beautiful? Community-based natural resource management in Malawi and Botswana. *World Dev.* **2006**, *34*, 1942–1957. [CrossRef]
71. Gaymer, C.F.; Stadel, A.V.; Ban, N.C.; Cárcamo, P.F.; Ierna, J.; Lieberknecht, L.M. Merging top-down and bottom-up approaches in marine protected areas planning: Experiences from around the globe. *Aquat. Conserv. Mar. Freshw. Ecosyst.* **2014**, *24*, 128–144. [CrossRef]
72. Lane, M.B.; Corbett, T. The Tyranny of localism: Indigenous participation in community-based environmental management. *J. Environ. Policy Plan.* **2005**, *7*, 141–159. [CrossRef]
73. Johannes, R.E. The renaissance of community-based marine resource management in Oceania. *Annu. Rev. Ecol. Syst.* **2002**, *33*, 317–340. [CrossRef]
74. Crawford, B.R.; Siahainenia, A.; Rotinsulu, C.; Sukmara, A. Compliance and enforcement of community-based coastal resource management regulations in North Sulawesi, Indonesia. *Coast. Manag.* **2004**, *32*, 39–50. [CrossRef]
75. Govan, H. Achieving the potential of locally managed marine areas in the South Pacific. In *SPC Traditional Marine Resource Management and Knowledge Information Bulletin*; Fisheries Aquaculture and Marine Ecosystems Division, SPC: Noumea, New Caledonia, 2009; Volume 25, pp. 16–25.
76. Katon, B.M.; Pomeroy, R.S.; Garces, L.R.; Salamanca, A.M. Fisheries Management of San Salvador Island, Philippines: A Shared Responsibility. *Soc. Nat. Resour.* **1999**, *12*, 777–795. [CrossRef]
77. Colwell, S. Entrepreneurial Marine Protected Areas; Small Scale, Commercially Supported Coral Reef Protected Areas. In *Coral Reefs: Challenges and Opportunities for Sustainable Management*; Hatziolos, M.E., Hooten, A.J., Fodor, M., Eds.; World Bank: Washington, DC, USA, 1997; pp. 110–114.
78. De Groot, J.; Bush, S.R. The potential for dive tourism led entrepreneurial marine protected areas in Curacao. *Mar. Policy* **2010**, *34*, 1051–1059. [CrossRef]
79. Bottema, M.J.M.; Bush, S.R. The durability of private sector-led marine conservation: A case study of two entrepreneurial marine protected areas in Indonesia. *Ocean Coast. Manag.* **2012**, *61*, 38–48. [CrossRef]
80. Riedmiller, S. Private sector investment in marine protected areas—Experiences of the Chumbe island coral park in Zanzibar/Tanzania. Presented at the 5th World Parks Congress, Sustainable Finance Stream, Durban, South Africa, 8–17 September 2003; Available online: http://conservationfinance.org/guide/WPC/WPC_documents/Apps_01_Riedmiller_v2.pdf (accessed on 15 July 2014).
81. Teh, L.L.; Teh, L.L.; Chung, F. A private management approach to coral reef conservation in Sabah, Malaysia. *Biodivers. Conserv.* **2008**, *17*, 3061–3077. [CrossRef]
82. Svensson, P.; Rodwell, L.D.; Attrill, M.J. Privately Managed Marine Reserves as a Mechanism for the Conservation of Coral Reef Ecosystems: A Case Study from Vietnam. *Ambio* **2009**, *38*, 72–78. [CrossRef] [PubMed]
83. Svensson, P.; Rodwell, L.D.; Attrill, M.J. The perceptions of local fishermen towards a hotel managed marine reserve in Vietnam. *Ocean Coast. Manag.* **2010**, *53*, 114–122. [CrossRef]
84. Vasconcelos, M.J.P.; Mussá Biai, J.C.; Araújo, A.; Diniz, M.A. Land Cover Change in Two Protected Areas of Guinea-Bissau (1956–1998). *Appl. Geogr.* **2002**, *22*, 139–156. [CrossRef]
85. Leeney, R.H.; Poncelet, P. Using Fishers' Ecological Knowledge to Assess the Status and Cultural Importance of Sawfish in Guinea-Bissau. *Aquat. Conserv. Mar. Freshw. Ecosyst.* **2015**, *25*, 411–430. [CrossRef]
86. Campredon, P.; Cuq, F. Artisanal Fishing and Coastal Conservation in West Africa. *J. Coast. Conserv.* **2001**, *7*, 91–100. [CrossRef]
87. Cross, H. Displacement, disempowerment and corruption: Challenges at the interface of fisheries, management and conservation in the Bijagós Archipelago, Guinea-Bissau. *Oryx* **2016**, *50*, 693–701. [CrossRef]

88. Berkes, F. Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *J. Environ. Manag.* **2009**, *90*, 1692–1702. [CrossRef] [PubMed]
89. Jentoft, S. Fisheries co-management: Delegating government responsibility to fishermen's organizations. *Mar. Policy* **1989**, *13*, 137–154. [CrossRef]
90. Pinkerton, E. *Co-Operative Management of Local Fisheries: New Directions for Improved Management and Community Development*; UBC Press: Vancouver, BC, Canada, 1989.
91. Berkes, F.; George, P.J.; Preston, R.J. Co-management: The evolution of the theory and practice of joint administration of living resources. *Alternatives* **1991**, *18*, 12–18.
92. Carlsson, L.; Berkes, F. Co-management: Concepts and methodological implications. *J. Environ. Manag.* **2005**, *75*, 65–76. [CrossRef] [PubMed]
93. Pinkerton, E. Toward Specificity in Complexity. In *The Fisheries Co-Management Experience*; Wilson, D., Nielsen, J., Degnbol, P., Eds.; Springer: Dordrecht, The Netherlands, 2003; Volume 26, pp. 61–77.
94. Tongson, E.; Dygico, M. User fee system for marine ecotourism: The Tubbataha Reef experience. *Coast. Manag.* **2004**, *32*, 17–23. [CrossRef]
95. Tongson, E.; Cola, R. Negotiating stakeholder agreements for conservation: The case of Tubbataha Reefs, Philippines. *Sci. Diliman* **2007**, *19*, 47–63.
96. Tubbataha Reefs Natural Park (TRNP). *Tubbataha Reefs Natural Park and World Heritage Site 2011–2021*; Management Plan; TRNP: Cagayancilo, Philippines, 2011.
97. White, A.; Maypa, A.; Tesch, S.C.; Diaz, R.; White, E.; Martinez, R. *Summary Field Report: Coral Reef Monitoring Expedition to Tubbataha Reefs Natural Park, Sulu Sea, Philippines, March 26–April 1, 2008*; The Coastal Conservation and Education Foundation, Inc.: Cebu City, Philippines, 2008; p. 111.
98. Dygico, M.; Songco, A.; White, A.T.; Green, S.J. Achieving MPA effectiveness through application of responsive governance incentives in the Tubbataha reefs. *Mar. Policy* **2013**, *41*, 87–94. [CrossRef]
99. Billgren, C.; Holmén, H. Approaching reality: Comparing stakeholder analysis and cultural theory in the context of natural resource management. *Land Use Policy* **2008**, *25*, 550–562. [CrossRef]