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Engaging common property theory: implications for benefit sharing research in developing countries

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Abstract: This article discusses the research relevance of benefit sharing and its implications for natural resource policy research in developing countries. It argues that the research challenge is how to improve understanding of benefit sharing policies by way of identifying the basic principles which underlie these policies. While benefit sharing is to a large extent context dependent, the central question we raise is whether we can identify a set of principles to enable one to describe, explain, understand and predict outcomes in relevant policy settings.

Keywords: Benefit sharing, developing countries, institutions, natural resources research, public policy, sustainability

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I. Introduction

Most governments in developing countries are struggling under great public scrutiny to develop and implement policies that seek to ensure fair and equitable sharing of the benefits arising out of the utilization of natural resources, be they renewable or non-renewable (Suneetha and Pisupati 2009). In extractive industries (oil, gas and minerals), for example, benefit sharing policies are evolving with heightened interest in response to concerns over the ever-growing gap between the rich and poor against a backdrop of the ever-burgeoning prices of primary commodities (World Bank 2007). The establishment of the Extractive Industries Transparency Initiative (EITI) in Zambia provides evidence of the growing efforts in developing countries to ensure fair and equitable sharing of natural resource benefits (Ministry of Mines and Minerals Development 2011). Similarly, benefit sharing policies have almost taken center stage in different conservation sectors such as wildlife, forestry, fisheries, genetic and water resources that previously marginalized certain sections of society. The several revenue sharing schemes in the wildlife sectors of southern African countries such as Namibia, Zimbabwe and Zambia underscore the prevalence and pervasiveness of benefit sharing policies in developing countries (Dzingirai and Breen 2005). As such, among the burning questions confronting natural resource policy researchers in developing countries relate to how to do policy analysis and strengthen capacity for benefit sharing research.

Despite a growing appreciation of the importance of benefit sharing, the concept has surprisingly received less scholarly attention from common property theorists operating in the field of natural resource policy. Notwithstanding a few notable exceptions, most studies have not given explicit attention to the relevance of common property theory to benefit sharing, particularly in the context of developing countries. Although some studies have occasionally drawn attention to the theory, little substance is discernible beyond the catch-phrase level. Yet, most of the benefits derived from ecosystem services in developing countries are regarded as common property (Wallace 2007). Not surprisingly, perhaps, the few studies that have made attempts have been narrow and superficial. For example, while the broader common property research has in the past two decades made tremendous progress in identifying different institutional approaches to natural resource governance (Ostrom 2005), the limited focus on benefit sharing has given emphasis to two generic typologies of benefit sharing arrangements: hierarchical and market-oriented. These typologies, albeit simplified, are representative of most classification systems found in the benefit sharing literature. As Ostrom (2005) observes, there cannot just be two ways of managing ecosystem

services – or even sharing benefits. What we need is an integrative science of benefit sharing embedded in common property theory.

In this article, we discuss the relevance of common property theory to benefit sharing in the context of natural resource policy research in developing countries. We argue that most benefits derived from the use of natural resources in developing countries are viewed as common-pool resources. This implies that the collective use of such resources is susceptible to externalities that make difficult their governance in a sustainable, efficient and equitable manner (Ostrom 1999). In many respects, these problems can be defined as classic collective action problems, which are a purview of common property theory. We first reflect on the scholarly relationship between benefit sharing and policy research in the field of natural resources. We then provide an account of common property theory and its implications for benefit sharing research. Using the lens of common property theory, we later discuss the gaps in policy research on benefit sharing particularly focusing on aspects of cooperation, institutions and collective identity. Our discussion is not only premised on the potential of common property theory to facilitate categorization of benefit sharing arrangements, but also it can assist in advancing the integration of the theory into benefit sharing research. Our aim is not to write a definitive exposition on the subject matter, but to spark debate and engage ongoing dialogue on benefit sharing in the field of the commons.

2. Benefit sharing and policy research

Benefit sharing approaches are increasingly being promoted as a means of addressing problems related to the governance of social-ecological systems in developing countries. These approaches seek to address fundamental questions about the complex and dynamic interactions between nature and society. It was not until 1992 that the Convention on Biological Diversity (CBD) formalized the concept of benefit sharing in international environmental law and governance (CBD 1992). Essentially, the concept denotes forms of social accountability and responsibility to direct returns from use of natural resources, be they monetary or non-monetary, back to a range of designated participants within socially designed arrangements (Hayden 2003). Over time, the concept has taken hold in a number of natural resource policy domains, from forestry, wildlife and water management through pharmaceutical, oil and mineral ‘prospecting’ to human genetic research.

In a way, benefit sharing approaches can be considered as part of the growing trend to promote the notion of ecosystem services, broadly defined by the Millennium Ecosystem Assessment (MEA) as the benefits of nature to society (MEA 2005). This trend is viewed as a way of exposing and highlighting the values of ecosystems to humans (Costanza et al. 1997, Boyd and Banzhaf 2007, Wallace 2007, Daily et al. 2009, Norgaard 2010). The formalization of the concept of benefit sharing somewhat culminated into the MEA in 2005, leading to massive policy enthusiasm in the role of ecosystem services in providing benefits

that support human well-being (MEA 2005). This global assessment changed the way in which natural resource policy research takes into account the value of biodiversity and ecosystems. Since then, however, the sharing of benefits derived from ecosystems continues to be contentious and challenging in many developing countries. The socio-political and economic context of benefit sharing is usually so complex and dynamic that decisions are always imperfect and temporary. Because supply and demand of ecosystem services are so unpredictable and variable in time and space (Koch et al. 2009), there are widely differing opinions on how to respond to such complexity, fuelled by heightened uncertainty about the likely consequences of collective choices.

The complex social-ecological challenges faced by governance systems involving ecosystem services are well documented (Farley and Costanza 2010, Norgaard 2010). These challenges have in the last two decades formed the core basis of international debates on the governance of ecosystem services in developing countries. In many instances, issues surrounding the sharing of the benefits of nature form the core basis of debates about the governance of access to and use of ecosystem services. On one hand, this is because ecosystem services are considered to play an important role in offering a wide range of benefits that directly support human well-being in developing countries (Brockhaus and Botoni 2009). On the other hand, it is because in most developing countries the sharing of benefits continues to be contentious and challenging (Philips et al. 2006, Turton 2008, Winickoff 2008). Given the enormous social differentials in the levels of economic, political and information power, sharing issues in developing countries are usually considered in contexts in which the majority of the people face the most serious and immediate risks from loss of the benefits deriving from ecosystem services. In such contexts, achieving sustainable allocation of benefits and promoting improvements in the human well-being of the rural poor presents formidable challenges.

To appreciate the research relevance of benefit sharing, one needs to deeply reflect on what is currently happening in developing countries that are heavily and directly dependent on natural resources for socio-economic development and poverty alleviation. The case of benefit sharing in developing countries provides an excellent example of the inextricable relationship between natural resource governance and sustainability. There is a growing understanding in natural resource policy research that sustainability issues and concerns in developing countries cannot be explored or discussed in isolation, but need to be examined within the broader context of benefit sharing (Norgaard 2010). Research insights into sustainability problems demand a full appreciation and understanding of the underlying benefit sharing processes and patterns. Not surprisingly, perhaps, countries rich in natural resources have had higher incidences of conflict and have tended to under-perform socio-economically. Countries with relatively abundant natural resources have also tended to suffer from poor natural resource governance including benefit sharing processes. We contend that the current

sustainability dilemma in Africa has more to do with a crisis of sharing than a crisis of resources. The research challenge is how to improve understanding of benefit sharing policies by way of identifying the basic principles which underlie these policies.

While benefit sharing is to a large extent context dependent, the central question being raised by researchers is whether we can identify a set of principles to enable one to describe, explain, understand and predict outcomes in relevant policy settings (Suneetha and Pisupati 2009). In terms of research, the concept of 'benefit sharing' has mostly been addressed within the interdisciplinary field of natural resource policy research. Policy research is concerned with knowledge of decision processes in the public realm (Lasswell 1971). It seeks to address questions related to what public goal values are sought, by whom and what trends affect the realization of those values (Brewer 1999). The study of public policy has evolved from a narrow focus on human rationality to a broader focus dealing with public capability to adapt and stick to moral norms of trustworthiness, reciprocity, and fairness (Ostrom 2002). For example, one major focus in the current works on genetic resources is related to the theme of 'access and benefit sharing' particularly in the context of developing countries. Most studies around access and benefit sharing revolve around the need to take into account human rights and poverty issues. In this context, the term 'benefit sharing' connotes human behaviors which emerge in response to particular societal arrangements related to the governance of ecosystem services. Benefit sharing is thus not only a political agenda in the context of sustainability in developing countries, but also a scientific concept for exploring and understanding the governance of natural resource access and use. However, though science can contribute to effective policies by clearly identifying benefit sharing options and the tradeoffs and uncertainties involved, ultimate decisions concerning specific criteria for benefit sharing are inevitably socio-political and embedded within particular cultural contexts.

3. Benefit sharing typologies

In this section, we provide a depiction of two typologies of benefit sharing that have dominated policy research: hierarchical and market-oriented. The hierarchical category involves approaches designed to facilitate the sharing of benefits between higher level and lower level institutional actors. For example, benefit sharing under the Convention on Biological Diversity (CBD) attempts to facilitate the sharing of benefits from use of genetic resources between international financiers from the developed world and national governments (in some cases this may involve indigenous communities) in developing countries (CBD 1992). The CBD provides mechanisms for ensuring that some of the benefits of industrial exploitation of genetic resources are allocated to nation governments and indigenous communities in the form of royalty sharing, technology transfer, and scientific capacity-building.

Similarly, benefit sharing arrangements under the rubric of community-based natural resource management (CBNRM) have been designed to facilitate the sharing of benefits between higher level (governments) and lower level (local communities) institutional actors (Gruber 2010). CBNRM approaches provide the means for local communities to share natural resource benefits with governmental actors. This usually involves the delegation of government functions from the centre to the periphery in the process of allocating ecosystem services. One of the most common features of CBNRM approaches has been the establishment of revenue-sharing mechanisms (Nkhata and Breen 2010). Other examples of benefit sharing approaches that reflect elements of hierarchical arrangements include Integrated Conservation and Development Projects (ICDPs), Community Forest Management, Integrated Water Resource Management (IWRM), and Community-Based Wildlife Conservation (CBWC). A central feature of these approaches is that they tend to be based on a benefit sharing system of command created to support a central agenda which is usually defined by international actors or national governments.

The second typology, which we refer to as market-oriented, involves a suite of voluntary benefit sharing arrangements that provide positive economic incentives to producers (landholders) of ecosystem services to sustainably manage ecosystems. For example, Payments for Ecosystem Services (PES) initiatives are increasingly being promoted as a major benefit sharing approach to conservation by way of rewarding the people who are responsible for the provision of ecosystem services (Nelson et al. 2009). PES initiatives are designed to create non-traditional economic incentives for the maintenance of ecosystems services. According to Wunder (2007), PES initiatives consist of voluntary and conditional transactions whereby an ecosystem service is purchased by at least one service buyer from at least one service provider. As such, these initiatives are usually considered to be based on economic incentives put in place to compensate providers of ecosystem services, on condition that the provider secures the provision of services (Sommerville et al. 2009). Examples of other approaches that reflect elements of market-oriented benefit sharing arrangements include Clean Development Mechanisms (CDMS), voluntary carbon markets projects, and Reducing Emissions from Deforestation and Degradation (REDD) initiatives.

We acknowledge that the two typologies have considerably contributed to natural resource policy research by way of improving understanding of the social structure and processes responsible for the generation of nature-based benefits used and enjoyed by humans. Perhaps surprisingly, however, these typologies have in practice been narrowly employed as a way of soliciting support from resource user groups who have been associated with 'resource-degrading behaviors'. While the term 'benefit' has in most cases been understood in its broadest sense, focus has narrowly been on the assortment of inducements that would buttress the efforts aimed at attaining sustainable utilization of natural resources. In the context of market-oriented arrangements, for example, benefit sharing initiatives have

largely been understood to imply the economic returns that are channeled back to rural groups resulting from the legal use of natural resources. Such returns have included direct cash or revenue, basic infrastructure as well as other categories of consumptive gains. Although it is logical to argue that economic benefits are vital to the success of natural resource management initiatives, we argue that on their own they are not sufficient to enhance the long-term sustainability of ecosystem services. In fact, we feel that benefits so defined reflect very narrow articulations of the benefits so derived from the full range of ecosystem services.

Based on the foregoing, it is indicative that there is need for more than just two typologies for the analysis of benefit sharing policies. Clearly, there cannot just be two ways of sharing benefits derived from ecosystem services. Hierarchical or market-oriented arrangements are limited policy prescriptions both in their form and function. Most of what is termed ‘benefit-sharing’ in these prescriptions comprises idealistic policy recommendations which rarely take into account real-world complexity. It is also suggestive that these narrow perspectives of benefit sharing have mostly been based on technical analyses. In large part, this is because the conventional approach to benefit sharing behind the two typologies centers on such activities as centralized technical decision-making, demand forecasts, the use of biophysical characteristics for inventories, modeling of ecological processes, assessment of environmental impacts, and identification of risks from developments resource uses.

While all these activities provide information that is useful for making trade-offs among competing demands for benefits, a narrow description of benefit sharing results in the governance of ecosystem services being effectively compartmentalized into isolated components. The governance of ecosystem services is reduced to a technical allocation of human values and associated benefits, with relatively little attention being given to the implications of broader social issues and concerns. Governance is seen as a political activity and sharing a technical one, each requiring their own specialized competencies. Important information such as shifts in social preferences is rarely transmitted to the technocrats. With benefit sharing conceived of in this technocratic way, opportunities for sustainable and equitable allocation of benefits derived from ecosystem services are limited. The emphasis on framing benefit sharing from technical perspectives, without examining how collective processes impinge on decisions about sharing, thus renders the two typologies inadequate frameworks. Importantly, the dominance of the two typologies does little to encourage understanding and potentially reframing of the ‘sharing problem’ in developing countries.

4. Taking common property theory seriously

We specifically view benefit sharing as embracing complex, inter-linked notions of social and ecological processes that highlight the gains from ecosystem services that accrue to participants through multilevel governance processes. Importantly,

we consider benefit sharing arrangements as the implementation of governance systems for ecosystem services at multiple levels of human organization. Although we do not claim that such arrangements are a panacea for all social-ecological challenges faced by governance systems for ecosystem services, we suggest that the extent to which governance systems are effectively implemented will result in particular common interests being advanced or hindered through benefit sharing arrangements. Arguably, the production and flow of benefits from ecosystem services result from both natural and human processes, but the ways in which benefits accumulate to beneficiaries are governed by a complex system of societal norms, rules and organizational processes that manifest in the form of institutions.

Benefit sharing is founded on complex long-term social exchanges that involve multiple interest groups with divergent expectations and experiences. These exchanges are usually characterized by behavioral processes in which interest groups influence each others' behaviors over a period of time in order to advance shared goals. Ostrom (1998) contends that the nature of such exchanges is critical in determining the success or failure of most human processes such as benefit sharing schemes. Perhaps not surprisingly, evidence and logic suggest that most approaches to benefit sharing have not been taking sufficient account of the nature and substance of the long-term exchanges that underlie benefit sharing schemes. Most studies that reflect the essence of the two typologies of benefit sharing have neither been taking sufficient account of the degree of social integration among participants in benefit sharing schemes, nor been drawing adequate attention to the nature of social differentiation among them.

Benefit sharing is viewed as a concept that enables participants to actualize gains from complex social exchanges. The issue of 'who benefits' involves consideration of the property rights of participants. Property rights are viewed in terms of the nature of relationships between participants (Bromley 1991). Commons (1968) defines a property right as "an enforceable authority to undertake particular actions in a specific domain" (cited in Ostrom 2000, pp. 339). Bromley (1991, pp. 2, 15) goes further to define a property right as 'a claim to a benefit stream [...] and the capacity to call upon the collective to stand behind one's claim to a benefit stream'. In effect, a right can therefore not exist without recognition and acquiescence by others in the form of relationships with regard to the individual rights-holder. Thus, property rights regimes are complex institutional structures and rules (formal and informal) that include both rights to access as well as rights to exclude from access (Schlager and Ostrom 1992).

Property to which a community of people may rightfully claim access and use constitutes a common property. Because there are usually rules governing how members of the community access and use the common property or resource (examples in Berkes et al. 2003), property rights 'encompass a diverse set of tenure rules and other aspects of access to and use of resources' (Meinzen-Dick et al. 1997, pp. 1303). Security of tenure is central to the notion of property rights (Gibbs and Bromley 1989) and thus if we understand property rights to refer to an individual's capacity to call upon the collective to stand behind his

or her claim to a benefit stream (Bromley 1991), then property rights essentially describe relationships between people. Conceptualizing property rights from the perspective of relationships supports the contention of Ostrom (1990) that social homogeneity is important in management of use and access to common property. Not surprisingly, Singleton and Taylor (1992) consider that the term ‘community’ has been central to the evolution of viable commons institutions.

A wide variety of research on common-pool resources has demonstrated that common property theory provides a useful perspective for examining social exchanges among collaborative actors and interest groups. Over two decades ago, Elinor Ostrom (1990) challenged conventional understanding that common property is poorly managed and should be completely privatized or regulated by central authorities. It is now generally acknowledged that conditions do exist under which local governance and cooperation are feasible. According to Ostrom (1999), it has also been shown when users of benefits of nature are given more voice in the design of institutions for governing ecosystem services, it is feasible to manage sustainably common-pool resources. Institutions, which are commonly referred to as the sets of rules that govern human interaction, play a crucial role to that effect. The main purpose of institutions is to facilitate exchanges. These insights are important not only to the study of common property, but also to the study of benefit sharing processes in general. In this way, we suggest that the need to understand the dynamics underlying common property systems has great implications for the efforts aimed at understanding and improving benefit sharing processes in developing countries.

Progress in common property research has assisted our understanding of the structural and behavioral aspects of natural resource governance. The manner in which humans regulate and facilitate access to benefits is of fundamental significance to the governance of natural resources. We believe that successful benefit sharing renders the governance of natural resources to effectively cope with timely and appropriate responses to societal demands, provides for the experimentation needed for effective operations in dynamic contexts, and encourages the assessment, reflection and learning underlying such activities. Viewing benefit sharing as a collective, iterative and adaptive process of creating and facilitating opportunities for dialogue leads to building understanding of how user groups transform common interests into on-the-ground actions. A common property perspective thus offers better heuristics for understanding the effects of collective action on sharing processes. Of fundamental significance to this article, a common property perspective facilitates understanding of how to better manage human behavior in benefit sharing schemes. Not only can such a perspective facilitate the integration of common property theory into benefit sharing research, but also it can help us better understand the human processes required for successful benefit sharing. What is demanded of scholars, policy-makers and managers is to take common property theory seriously.

5. Gaps in policy research on benefit sharing

It is envisaged that sharing issues will continue to form part of the core research agenda on the governance of access to and use of ecosystem services in developing countries. This is especially the case given that most natural resources in developing countries are regarded as common property (Wallace 2007). As demands for access to and use of ecosystem services become more diverse and grow, relative scarcity will increase fostering competitive rather than cooperative behaviors necessary for sustainable allocation of benefits, particularly from common property resources. In such complex contexts, governing access and use is not simply a matter of setting a utility function and selecting the alternative leading to the preferred set of consequences. On the contrary, it requires a systemic framing of key determinant variables which define the effectiveness, efficiency, equity and sustainability of benefit sharing arrangements. Knowledge about benefit sharing arrangements must be scientifically reliable and evolve to remain contextually relevant. Based on the foregoing, we were able to identify three related thematic areas as being representative of the major gaps in policy research on benefit sharing insofar as common property theory is concerned. These are cooperation, institutions and collective identity.

5.1. Cooperation

One of the central questions underlying policy research insofar as the two typologies are concerned has been the need to understand the nature of cooperation between the producers and users of the benefits arising out of the utilization of natural resources. Most benefit sharing policies have been frequently analyzed under the lens of cooperative approaches to benefit sharing. These approaches have received increasing attention from policy researchers who want to understand how cooperative arrangements work and how they can be supported, improved and reoriented to advance benefit sharing (Phillips et al. 2006, Winickoff 2008, Jägerskog and Zeitoun 2009). As such, an important component of benefit sharing policy research has involved improving understanding about how benefit producers and users work together across community, national and regional scales to create more benefits than could be produced in unilateral settings.

For example, a key study area around the provisions of the CBD regime focuses on the mechanisms for promoting cooperation between producers and users in development of biotechnological products (Suneetha and Pisupati 2009). This in a way implies that the collective use of genetic resources is recognized as being susceptible to externalities that make difficult their governance in a sustainable, efficient and equitable manner (Ostrom 1999). Similarly, in the water sector, while a number of researchers such as Phillips et al. (2006) have responded to the need for improved understanding of cooperative approaches to benefit sharing, it is still largely unclear whether this research is assisting us advance knowledge about

how to create the necessary conditions for cooperative behaviors in the sharing of benefits.

In most developing countries, the benefits derived from the use of natural resources such as forests and rivers are viewed as common-pool resources. The biophysical attributes of common-pool resources are known to have determinant effects on some of the performance variables of cooperation (Ostrom 1999). It is always important to acknowledge that similar cooperative approaches may produce entirely different outcomes depending on the nature of the biophysical attributes of common-pool resources (Ostrom 2005). For example, some of these attributes may be favorable to the use of hierarchical forms of benefit sharing, others may be favorable to market-oriented arrangements and still others may be favorable to a combination of these typologies – or even favorable to unknown forms of benefit sharing arrangements. It is for this reason that we view the CBD approach to benefit sharing as been limited. By confining benefit sharing to a single level of biodiversity (genes) which has its own unique biophysical attributes, the CBD approach overlooks the biophysical attributes of other levels of diversity and leaves the way open for non-systemic analyses of benefit sharing policies.

Although improved governance of benefit sharing systems may result from enhanced cooperation, there are often greater incentives for participants not to cooperate in the sharing of benefits derived from use of natural resources. This is because individual users of a resource usually have strong private incentives to act in ways that are detrimental to the group as a whole. This is compounded by the unwillingness of actors operating at multiple political and spatial scales to learn how to learn together in addressing problems associated with the sharing of benefits from common-pool water resources. Examples of non-cooperation in benefit sharing schemes are well-documented (Brockhaus and Botoni 2009, Kosmus and Cordero 2009, Suneetha and Pisupati 2009, Nkhata and Breen 2010). In many respects, these problems can be defined as classic collective action problems, which are a purview of common property theory. Notwithstanding a growing appreciation of the importance of common property theory in analyzing collective action problems, research on cooperative approaches to benefit sharing has not given explicit attention to this expanding body of knowledge. If knowledge about cooperative approaches to benefit sharing is to remain contextually relevant and scientifically reliable, there is need to embed common property theory in related principles and practices.

5.2. Institutions

Policy research on benefit sharing needs to take lessons from common property studies. An important lesson from common property studies is that institutions matter in the sharing of benefits, burdens and risks. As indicated earlier, institutions refer to the prescriptions that people use to organize all forms of repetitive and structured human interactions (Ostrom 2005). These prescriptions may include different sets of shared norms, rules, and organizational mechanisms for regulating

access to and use of ecosystem services. While some of these prescriptions are formal, others can be perceived to be informal by participants in particular benefit sharing arrangements. These prescriptions can also exist at local, national, regional and global levels. As such, particular prescriptions, as Agrawal (2002) observes, have to be examined within their context. This perspective lies in distinct contrast to the two typologies of benefit sharing discussed above. This is partly because the technically biased approach behind the two typologies is inconsistent with the understanding that different prescriptions can have different impacts in different contexts. Depending on context, some prescriptions can lead to highly inefficient, inequitable and dysfunctional benefit sharing systems. Still others may enhance the fairness, efficiency and sustainability of benefit sharing mechanisms. Thus, if policy researchers concentrate on studying two typologies of benefit sharing they would not be able to expose other effective sharing mechanisms which in the past enabled indigenous local users to sustain natural resources.

Policy research on benefit sharing needs to address the dynamics of institutions in the context of temporal and spatial changes. Particularly, it needs to investigate how enduring benefit sharing institutions are determined by the nature of rules as well as the processes of rule making and enforcement. Enduring in this context does not simply imply that there is some idealized or steady state of a system but rather that the institutions for benefit sharing are resilient. For example, security of tenure is central to the resilience of benefit sharing institutions as it denotes the capacity of a participant to call upon the collective to stand behind his or her claim to a benefit stream (Bromley 1991). Resilient institutions for benefit sharing are able to adapt to continually changing circumstances, thereby sustaining the structure and function of a socially acceptable sharing system. In other words, resilience confers an ability to maintain desirable institutions despite fluctuations in structure and function (Anderies et al. 2004).

We argue that a broad-based approach to policy research that considers institutional design and performance is required in order to formulate reliable models of successful benefit sharing in developing countries. While complimenting the two typologies, such an approach needs to take into account the enduring regularities of collective action defined by rules, norms and strategies which are constituted through common property systems. We note here that in many instances collective action in benefit sharing schemes is affected by the nature and design of the institutions in society that engender and shape these regularities. For example, it has been shown that most institutions involved in benefit sharing schemes that employ the CBNRM model are imbued with boundary problems that defy collective and coordinated actions. The institutional boundaries around community-based groupings usually channel communication in ways that encourage fragmentation in the distribution of knowledge. In such instances, the multi-scale nature of benefit sharing hinders the ability of participants to contextualize knowledge at scales required for equitable and empathetic benefit sharing. Since institutional boundaries also hinder the way in which governments

communicate with these communities, this makes it difficult for society to frame sharing problems and solutions in integrated ways. Ultimately, successful benefit sharing requires an understanding of the behavioral responses by individuals and groups to the institutional boundaries that mediate interactions among actors.

5.3. Collective identity

Collective action is dependent upon the efforts of the resource users to establish an identity that is held collectively (Cumming and Collier 2005). By collective identity, we refer to the shared meanings, experiences and expectations that direct the behaviors of resource users and differentiate a group of users – in other words the collective – from other similar social units (Araral 2009). Collective identity can be characterized as an outcome of dynamic relational processes that are evinced in collective action situations. Such processes change over time and from situation to situation. The amount of change in collective identity is important in determining how users cope with social-ecological change when it is almost impossible to predict with accuracy the future states of the benefit sharing arrangements. In a way, multiple states of benefit sharing arrangements provide the substance of a dynamic governance system. When collective identity is not effectively managed, misunderstandings and disagreements among producers and users emerge.

Policy research has shown that one of the main implementation weaknesses of most benefit sharing regimes is usually related to their ability to buffer governance arrangements from external forces and shocks (Dietz et al. 2003). We postulate that most benefit sharing arrangements largely fail due to inadequate attention to the resilience of collective identity. This is because collective identity can be considered as an important precursor that facilitates or impedes change in collective action as it relates to the use of common property (Melucci 1996, Polletta and Jasper 2001, Snow 2001). Collective identity shapes benefit sharing arrangements through relational processes that influence governance. Importantly, it affects the users' ways of behaving in a governance system by aligning and fostering their capacity to deal with complex social-ecological change. In that context, a resilience perspective (Nkhata et al. 2008) of benefit sharing would be important in illustrating how benefit providers and users can enable benefit sharing systems to cope with discontinuous change and shocks. Such a perspective is instructive in that it shows how benefit producers and users can make decisions about how to shape the performance of benefit sharing arrangements and how they can either change or maintain forms of benefit sharing arrangements that buttress the common interests of participants. As such, research on the resilience of collective identity would provide improved understanding about the wide range of possible pathways for the future development of benefit sharing arrangements.

Cumming et al. (2005) and Cumming and Collier (2005) have argued for the significance of understanding identity change in the resilience of complex dynamic social ecological systems. These authors suggest that identity change

in dynamic complex systems should be defined in terms of: (1) the components that make up a system; (2) the relationships between components; and (3) the ability of components and linkages to maintain themselves continuously over space and time. Accepting the importance and vulnerability of collective identity in directing behaviors of resource users towards the collective highlights the need to develop understanding of how to foster resilience in collective action. We are of the view that the nature and substance of governance systems affect the resilience of benefit sharing arrangements primarily through the variable of collective identity. The collective identity of producers and users does not exist in a stable state and therefore needs to be nurtured and sustained to correspond with the dynamics of complex adaptive systems. To that end, collective identity studies would enable policy research to categorize forms of benefit sharing arrangements and to identify those behaviors that exert negative influence on collective action processes.

6. Concluding reflections

We have attempted to explain the relevance of common property theory to benefit sharing in the context of natural resource policy research in developing countries. In so doing, we have provided an account of common property theory and its implications for benefit sharing research. Using the lens of common property theory, we have exposed the gaps in policy research on benefit sharing particularly. We acknowledge and emphasize that research on common property has paid less attention to the issues of benefit sharing which are dominant in policy and management domains. Partly, we attribute this situation to the understanding that benefit sharing is strongly viewed as a normative concept. Some researchers usually question the rationale of possibly applying science to the benefit sharing concept which is usually considered by some to be a normative concept. In other words, these researchers challenge the possibility of scientifically interrogating benefit sharing which is something that some sectors of societies tend to desire and others despise. Indeed, some sectors of societies generally consider benefit sharing to be a good thing while others do not. As such, the concept involves questions of values, whose values and how they are measured. Sharing and anti-sharing positions are usually presumed to be irreconcilable (Schuklenk and Kleinsmidt 2006), with no scientific means available for reaching conclusions on questions about what is right or wrong.

We realize that the process of determining the degree of sharing that is necessary to ensure legitimacy is context dependent and relies on specific national policies, legislation, as well as the stakeholders involved. Decisions regarding why benefits should be shared, under what conditions should they or should they not be shared, and who participates in such sharing essentially involve value judges, which are a preserve of political systems. On the other hand, however, we recognize that the process of comprehending, describing and explaining the complexity of benefit sharing arrangements poses considerable changes to both

the policy and management domains. Given that by their nature benefit sharing arrangements cannot be captured in a single model, science can be used to facilitate understanding about the complex realities of particular societal arrangements of benefit sharing. Once society decides on the form and direction that it wants particular benefit sharing arrangements to take, key questions arise about how to build processes to make that happen and how to understand the diversity of values that would bring that together. To that end, gaining an in-depth understanding of the processes that would produce or prevent the socially acceptable outcomes of particular benefit sharing arrangements is all the more important.

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