

Natural Resources as Power: Participatory Decision Making in Development

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The Internalization of Natural Resources: Perspectives and Discourse

Considerable progress has been made in the past few years in understanding the structure of opinions, of which the three main ingredients are: (1) attitudes toward some object, consisting of pro-con evaluations, (2) beliefs about the connections between objects, consisting of information perceived to be true, and (3) values, consisting of pro-con evaluations of goals (Rose:179).

As is iterated in the above quote, there are many variables that go into the opinion and perspectives of people. It is the perceptions of an individual, community, or nation-state that is often based upon past experiences and built-upon knowledge that greatly dictates the actions taken. This holds true when looking at human interactions with and policy concerning environmental resources. The differences in these perceptions and how they are developed are directly related the resultant interactions with and use of natural resources, and greatly integrated with local power structures, which so affect environmental policy and decision-making procedures. As is true with any multi-party decision-making body, the incentives, experience-base and knowledge-base that each party brings to the table plays a key role in their perception of the greater problems at hand. Needless to say, these elemental attributes are often in conflict with those of the other members of the decision-making body. It is within the linkages and overlap between multiple discourses and perspectives on natural resources that lies the ultimate social and political potential for change.

Much of the discussion coming from conservationists and biologists are focusing on methods for integrating natural and human systems and increasing the position of the 'environmental discourse' within the often politically and economically focused decision-making systems. Within this, there is a real effort to better understand the ways in which people and communities are able to "*modify the environment to enhance natural values, not degrade them, while making their living*)." ¹ In many ways, although the ultimate goals of this type of approach are to enhance ecologically sustainable human development, there

¹ Sanderson et al., 2002, p902

methodology is overlooking the most basic understandings of human 'opinion' and perspective: What is the relationship between natural and social? Are they integrated? Is there a divide, or are they one in the same? Where are the boundaries? Where are the synchronicities in these systems? What else feeds into them? Harvey reiterates this in his discussion concerning the nature/society divide within geography and sense of space:

Where in this room does the natural environment begin and the social environment stop? Where in a field of wheat does nature begin and sociality stop? We have these extraordinary conventions that there is something called 'nature' and something called 'society.' There are two boxes, can we put those two boxes together? (Harvey Interview)

As is seen in Harvey's example, different discourses about the environment, in a way, are creators of their own reality. If one maintains a perspective that 'nature' is a pristine mountain lake and the water coming from the tap in your apartment is 'society', there is an inherent disconnect and lack of causality between the two: If I use water from my tap, it's provided by the City of New York and they are responsible for me having enough of it for my needs. This perspective, will then transform into the reality of my water use and efficiency of use (or lack thereof) within my everyday life. Likewise, another example of discourse affecting action could result in: If I think that water resources are a 'gift from the gods', then my use of and relationship to this water would be altered accordingly; Such as refusing to pay for resource access or use, and/or believing that there is a continual supply and conservation of the resource is not necessary. In many ways, the study and integration of multiple discourses in to policy concerning the management of natural resources allows for a greater connection to the actual ecological processes, rather than a focus on production and consumption.

Harvey emphasizes in the following quote that there is an inherently circular nature to the discourse-action loop, one in which the historical use and practice does, in turn, have great potential for altering local discourses:

Practices, for instance, incorporate technological understandings, which would be achieved through science and through the formation of certain kinds of discourses. So production internalizes much of what we have learned through discursive analyses and, at the time of course, discourses are not immune to being transformed and translated by material practices (Harvey).

Alternatively, it is the very discourses that color the role of the natural resources within society. Discourses are positioned as power initiatives within society. The scientist will be regarded as an “expert” in his or her field and, therefore, will be given legitimacy when speaking about and integrating technical reports into management strategies; This would be seen as a direct internalization of scientific discourse into policy. However, there are many inequities within a society as to the ‘weight’ or ‘pull’ of one discourse or perspective over another. In some regions, political discourse may have total reign; in others, scientific discourse will be highly revered; yet others may look towards cultural norms and practices in the form of religion or other practices as leadership. In this sense, the positionality of either a community or ‘player’, coupled with the legitimacy and weight of the associated discourse has a major impact on the level of environmental discourses in decision-making concerning the allocation, use and conservation of natural resources.

In this paper, I will further explore some of the key connections between natural resources, perspectives, and positioning within decision-making structures. In the following section *Development: A Focus on Consumption and Production* I will analyze the links between underlying concepts of development, including increases in consumption and production, and the incongruities between this thinking and the sustainable use of natural resources, coupled with the potential for increased quality of life. In *Poverty, Power, and Natural Resources*, I continue the discussion to include connections between poverty and empowerment through natural resource management and access. Furthermore, in this section, I try to better understand some of the correlations between poverty and resource use. In *Participatory Resource Management: Efficiency and Equity*, I look at the positive and negative aspects of the participatory

approach in terms of increased equity of allocation, particularly to marginalized groups. Following this discussion, I look specifically at water resource and participatory systems, including key examples of the variables applicable to and need for more exploration into the structure of these systems in *The Struggle of Water: Water Resources and Participatory Systems*. In the final section, *Conclusions: Where are we? And Where are we Going?* I summarize many of the key points throughout the paper and conclude with the synthesis of concepts of natural resources and participation within development.

Development: A Focus on Consumption and Production

It is absolutely clear that by his activity, man changes the forms of the materials of nature in such a way as to make them useful to him. The form of wood, for instance, is altered if a table is made out of it. Nevertheless the table continues to be wood, an ordinary, sensuous thing. But as soon as it emerges as a commodity, it changes into a thing, which transcends sensuousness (Marx, 163).

Natural resources and a populations' access to these resources are often central to the development of the population and is indicative of the economic status of the population.² Simultaneously, economic development is often associated with increased production and consumptive power, which is assumed to lead to economic growth. As is emphasized by Marx in the above quote, man has become adept at 'transforming nature' to suite human-driven consumption. However, this transformative capacity, has also led to the objectification of and increased ideological distance of man from natural systems and their interdependence.

Few argue the extremes of human population growth in the past centuries, but it is the impact of this growth and its' subsequent effects on social, environmental and economic systems is highly debated. Although the overall average material wealth of the globe has increased, however, the disparity in wealth between nations continues to grow; with the rich getting richer and the poor getting

² Markandya: 2004.

poorer.³ The question then remains, how does wealth correspond with natural resource use and what are some of the aspects of development that are affecting natural resources and these other systems? In this section, I would like to take a closer look at the concepts of consumption and production and how they're role in development are pushing for the unsustainable use of natural resources.

Ideas of “comparative consumption”, which imply that as some members of communities’ consumption change, others’ concept of “well-being” is altered accordingly, bring up many interesting links between perception and consumption.⁴ In other words, if your neighbor builds a new addition on their house and buys a Hummer and a new wardrobe, you are more likely to think that your current well being, or quality of life, does not seem quite as acceptable as before. The sense of lacking will, therefore, drive your consumption higher in an effort to live up to the standards set by your neighbors. The question is: How influential is this comparative consumption in relation to resource extraction? And, how can this behavioral phenomenon be used to drive down natural resource consumption, instead of driving it up? On the other there are concepts of “communal responsibility” prevalent in many cultures, which emphasize the protection of “local commons from overexploitation by relying on social norms, by imposing fines for deviant behavior, and by other means (Dasgupta: 15)”. Although this form of conformism is a key indicator in social change, particularly in regards to population growth, the question that follows is how can both concepts of “social communal responsibility” and “conformism” be harnessed to influence a communities’ relationship with local natural resources?

Another important aspect of population and consumption growth is to actually look at *where* increased consumption has been focused and the quality of the goods being produced. (i.e. Products today are often made to be replaced to continue the consumption-driven cycle.) Furthermore, much technology has led

³ Williamson (2002)

⁴ Arrow et al. (2003)

to an increase in “efficiency”, but, again, has this really improved overall quality of life? DeLong argues that increased wealth leads to taking things for granted, which is an interesting concept to push: As technology comes, we shift our priorities and lose track of the actual changes in lifestyle that have occurred over time. Another extension of this would be to question the association of both efficiency and consumption with the very subjective term of “quality of life”. Do money and increased consumption have a direct influence on one’s enjoyment of life or does it create an increased dependency on variables that are very much out of the individual’s control? (i.e. dependency on the company that provides the goods deemed “necessary” vs. former situations of self-sustenance). Furthermore, as Ritzer points out in his analysis below of the growing private credit sector in the United States, although increased levels of consumption are often associated with increased “development” and, therefore, global positioning, there is a definite, often-overlooked constraints and long-term negative social and economic effects for the individual or community:

While new means of consumption enable people to do things they could not do before [empowerment], they also constrain them to buy more than they need; to spend more than they should ...In fact, important status symbols in modern society are the number of credit cards one has in one’s wallet as well as the collective limit of credit available on those cards. Rather than the amount of savings one has, the modern status symbol is often how much debt one has and, better yet, how much more debt one can incur (Ritzer: 101).

Ritzer directly points out the underlying problem with consumption as a driving force in development: Consumption as ‘growth’ and ‘progress’ and ‘power’ leads to the overextension of debt and overexploitation of resources. Although Ritzer is referring specifically to economic resources, the same theory can be directly translated to natural resources use and consumption. Some argue that the creation of an optimum level of consumption is nearly impossible, however, that is possible to formulate a “consumption path” within an economy.⁵ Although I would argue that there are processes that can contribute to the derivation of sustainable consumption patterns, there are distinctive concerns with the

⁵ Arrow et al (2003)

creation of an empirical value for “acceptable consumption patterns”. It seems that this type of data could easily be misconstrued as a true baseline for activity, where behavior must mimic levels in order to be sustainable. Empirically, this makes sense, however, within the tremendous flux of ecological systems, how can an empirical formula apply to the sustainability of the system as a whole? And how can we allow for the gap in human capacity for modeling the ecosystems and interrelationships and the simplicity of said models created?

There are so many assumptions within the models and formulas concerning human behavior and ecosystem function that it seems that the sheer volume of assumptions being made (no matter how accurate each individual assumption may be relative to the whole system) invalidates the process as a real tool for analysis. Do human patterns of decision-making really follow a reliable model? Isn't this assuming a certain level and predetermined set of rationales? Accordingly, what are all of the variables that contribute to human levels of consumption? Can this really be simplified enough to create a viable, applicable model to be used for “sustainable consumption patterns”? What is the rate of return on human quality of life and happiness? Is it ecologically sustainable to determine consumption merely on human quality of life, without taking into account other species? How does focusing on human-driven needs vs. ecosystem-needs or biodiversity-driven needs change the overall model for sustainable consumption models?

Within a country's economic structure, it is very rare to see the inclusion of either natural resources or social cost for goods in the overall plan for consumption and market-driven actions. A multifaceted reason for this exclusion is that these services are not inherently accompanied with a price tag. The question remains, however, as to how is it possible to allocate monetary value to these resources and (often viewed as) subjective variables? And who will do this? What factors will be considered? Furthermore, natural resources are often transitory in nature and transgress property boundaries, governments, and other cultural barriers,

making the establishment of property rights very difficult.⁶ The main problem associated with the allocation of monetary value to these said resources is that “value” is a greatly subjective concept and, additionally, doing so allows for an objectification of said resources.

Measuring changes in quantities of capital stocks is very difficult. This is especially hard in the case of stocks of natural resources such as minerals, fossil fuels, fish or insects. In evaluating the social losses from reductions in natural resources – and thus the alternative investments necessary to offset such losses – in principle one needs to consider all of the contributions of natural resources to present and future utility. Such contributions may be direct, as, say, objects of natural beauty; or they may be indirect, as in the contributions of ecosystem services such as water purification, flood control, climate stabilization, pollination of crops, control of agricultural pests, and the generation and maintenance of soil fertility (Daily, 1997); or they may be both (a wetland) (Arrow et al: 25).

According to some, it is possible to reflect the worth of natural resources through shadow prices, which both measure the “social worth” of goods and services.⁷ However, this argument does not really answer the question of how to allocate a price tag to these resources. How is one to determine the “social worth” of natural resources? In her analysis of resource pricing and prioritization, Partha Dasgupta argues that through field research it is possible to “determine the connectedness of natural capital from a study of the ecological processes at work (Dasgupta: 9).” However, how does one simplify and segment natural resources and ecological processes (i.e. in determining the value of the forests, one cannot ignore the value of clean air, lower soil erosion, increased water quality, biodiversity, etc)?

By separating anthropogenic factors from the ecosystems they are impacting, it is being assumed that humans are not indeed intrinsic members of the ecosystems (rather than external, unassociated actors). In order to truly analyze the impact of human-driven change and consumption on the earth’s ecosystems,

⁶ This will be discussed further in *Participatory Resource Management: Efficiency and Equity*.

⁷ Dasgupta et al.

it is crucial to take an integrative, systems approach. Accordingly, there are limits to human resourcefulness and to the potential substitutions for limiting resources. In economics, it is possible to transfer one type of capital for another, however, in ecosystems each attribute is interlinked in a very specific, if not fluid, relationship. Therefore, the change in one segment of the system automatically leads to changes in other segments of the system and components are not necessarily easily substituted, if at all (i.e. if water quality is decreased greatly in an area, one cannot simply substitute greater attention to air quality to help the fish, no matter how linked these two components are. However, attention to air quality may help encourage an increase in water quality.

As population increases, environmental pressure, although detrimental, is also leading to an increase in technological advancement and more efficient use of resources in some cases.⁸ It is often argued that a household's ability to invest in more sustainable natural resource management depends on both enough gross assets and the desire to apply those assets to natural resource management. However, this argument is also coupled with the assumption that "technological advancement" is necessarily an expensive tool and/or positive to ecological health and wellbeing. As has been seen time and time again, many "advancements" such as the use of pesticides and large-scale monocrop agriculture often leads to disastrous effects on water quality, soil quality, long-term productivity, etc. Additionally, this argument does not take into account the importance of local knowledge in natural resource management; It is a narrow-minded assumption that there cannot be a collaboration of human influence and "natural systems"—assuming that areas of high human influence cannot have as much conservation effects. It is key for conservationists to be able to determine how to integrate the two systems, particularly in the face of increasing consumption and human population growth.

⁸ Swinton, Escobar, & Reardon, 2002.

There is an obvious relationship between population and consumption. However, I would argue that it is the concepts of continual growth associated with what is deemed a “successful and growing economy” have great potential for being increasingly detrimental to the amount of resource degradation throughout the globe today. However, the combination of a shift in economic theory to include both social and environmental cost with an increased understanding of the role of environmental systems in societies could prove very beneficial to many. Within these systems, there is a wealth of information and interrelated cycles that have the potential to encourage “growth”, increase sustainability and improve quality of life.

In this section, I have looked at how consumptive patterns associated with growth and development are contradictory to the very sustainability of human systems and the natural resources on which they depend. In the following section, I will examine further some of the connections between poverty and empowerment through natural resource access and management.

Poverty, Power and Natural Resources

I believe that the concept of power is an intrinsic desire for the human animal. We feel vulnerable, one way or another, in our natural state (both man and woman). In this sense, we find that the easiest way to gain power is through physical domination of others, whether it be land or woman. At its simplest, consumption is the key to physical domination. I have argued that in order to consume, we find it necessary to objectify. Accordingly, I believe that it is the underlying perceived right to ownership and private property that has led to a rationalized objectification of both women and the environment. We have, therefore, created a cycle of domination leading to ownership, leading to extraction, leading to waste (DePorte, 2000, pg.20).

As was discussed in previous sections, the ‘boxing off’ of natural resources and the separation of related discourse from decision-making and policy concerning human consumptive patterns, has led to increasing exploitation of natural resources. Humans are consuming large percentages of the net primary productivity of the earth, over half of the freshwater supplies, and much of the productivity of the oceanic shelf. The 20th century has seen a dramatic increase

in both human population and average consumption. The “human footprint” is defined as the sum total of “ecological footprints” (estimate of the amount of resources needed to support one human). According to “Human Footprint theory”, through the mapping of the causal relationships between humans and the earth’s ecosystems, the divide between environmental degradation and their acknowledgment in both policy and economic decision-making will be alleviated.⁹ However, at the same time, in many regions of the world, it is very difficult to directly quantify the impact of humans on local and global ecosystems. Furthermore, there are many conflicting arguments between the relationship between income and/or “wealth” and consumptive patterns:

Apart from the difficulties in installing meters and monitoring water use, the problem with this method is that consumption is not that strongly related to income (Markandya: 10)

Although Markandya points out that there are many disparities between income and consumption levels, at the same time, poverty is often directly linked with low levels environmental quality and access to natural resources.¹⁰ In many ways, the collaboration of the environmental and social justice movements is tapping into a very powerful argument. They are highlighting the connections between natural resource extraction, use and exploitation and the cost/benefit resulting social inequities that ensue. As is pointed out in the following quote, there is often a direct causality between poverty and environmental degradation:

The implication of the focus of the vicious circle of poverty and degradation is that poverty alleviation will necessarily reduce degradation of the environment, and its’ inverse, that arresting and reversing environmental decline will help the poor (Reardon and Vosti, 1995, p2).

Accordingly, environmental degradation is often connected with the disempowerment and disadvantage of underprivileged, marginalized societies. More often than naught, poverty is felt the most in areas of environmental degradation or lack of accessibility to natural resources; thereby creating a

⁹ Sanderson et al.: 2002

¹⁰ Reardon and Vosti: 1995

positive feedback loop of poverty and environmental degradation (in that often populations are forced to resort to ecologically-harmful practices to survive)- which leads to total environmental degradation and the death of populations. Some argue that populations living in poverty exploit their natural resources in order to escape poverty and, furthermore, suggest that one of the more effective measures for alleviating this cause and affect relationship is through more stringent land use regulations.¹¹ Others enforce that the increased participation of marginalized populations in the decision-making process will lead to more equality and sustainable use of resources. For instance, globally, the inclusion of women in the water sector is seen as a means of empowerment and helps to increase levels of efficiency as well. There is an inherent sense of ownership of resources associated with the inclusion of such traditionally excluded members of society, which is presumed to lead to increased efficiency of use and social responsibility:

The inclusion of women in management roles on water committees and associations is seen to represent a form of female emancipation, representing women's assertion and control over their lives as well as conveniently ensuring the sustainability of facilities. Poor women paying for water services are supposedly 'empowered' as consumers, whilst the financial efficiency of the project is furthered. (Cleaver: 598)

Although participation is certainly a form of empowerment for the women mentioned in the above quote, it is important to note that this participation is merely a stepping stone in the struggle for representation and becoming involved in the transformative capacity for development.¹² However, this alternative to the actual decrease of access to natural resources through stringent regulations and top-down approaches, a more effective means of ending this cycle is to help to integrate local systems with technical and political institutions, incorporating multilevel perspectives of resources-use and conservation with sustainable local living, the growth of local markets, and the improved quality of life, human and ecological; At the least, it is crucial to synthesize the two approaches. The key

¹¹ Swinton, Escobar, & Reardon: 2002.

¹² This will be further explored in the following section.

argument here is that there are varying types of human poverty and environmental degradation, creating a complex system of relationships and by connecting conservation to local systems of religion, land-tenure, and long-standing cultural understandings, the need for external motivational incentives is greatly diminished. Furthermore, there is a development discourse that has, in many ways, numbed the potency of empowerment by using global regulations and frameworks that are limited in their scope and levels of inclusion and often do not specify the scale and methodology behind their recommended programs, or are reversely too limited in scope and specificity to be applicable to more general mechanisms of sustainable development and equity. These criticisms are not meant to negate the 'good' that comes out of increased community and individual participation, but instead to emphasize that there needs to be a more complex analysis of the connections between participation, empowerment, and sustainable development.

In this section, I have attempted to relate issues of poverty with natural resources use and management. In the following section, I will further explore different aspects of the participatory management approach and the twofold goals of increasing the efficiency and equity of distribution of natural resources, while allowing for the sustainable use of these resources.

Participatory Resource Management: Efficiency and Equity?

As was discussed in previous sections, the positioning of a resource within a society is highly dependent on the perspectives and base-experiences of the community. Likewise, the management of the resources is interlinked with these ideals; however, the level of efficiency and ultimate structure of management and allocation is dependent on many competing factors. The efficient use and allocation of a natural resource is not necessarily in agreement with social, cultural, political or economic structures; Environmental systems, although directly impacted by these manmade systems, exist and are driven by external factors. Whether the provision of a resource is most efficiently coordinated

through markets, collective action, or political structures depends on the nature of the resources and its economic, technical and social positioning within the community. As Cleaver emphasizes below, there are often conflicting goals within the structure and theory behind participatory approaches:

The theorizing of participatory approaches is often dichotomized into means/ends classifications. These distinguish between the efficiency arguments (participation as a tool for achieving better project outcomes) and equity and empowerment arguments (participation as a process which enhances the capacity of individuals to improve their own lives and facilitates social change to the advantage of the disadvantaged or marginalized groups). (Cleaver: 598)

Currently, there is a global push for both participatory natural resource management and privatization of natural resource management throughout the world. Much of this pressure is coming from international funding agencies such as the World Bank and IMF, which are responsible for the financing of much resource management. Undoubtedly, increased citizenry participation in decision-making is beneficial to the overall understanding and say of peoples in resource allocation, management, and conservation, however, at the same time, there are many potential falsehoods within the specifics of the participatory structures that are often overlooked. In this section, I will examine further some of the benefits and areas of attention in the structure of participatory resource management structures, with the particular objective of structural checks and balances that allow for the increased levels of representation to the most marginalized groups in a society. As was discussed in the section concerning environmental discourse and perspectives, there is a great need for the incorporation of factors contributing to local decision-making processes and societal structure simultaneous to their inclusion in other systems:

Social structure is variously perceived as opportunity and constraint but little analyzed; the linkages between the individual and the structures and institutions of the social world they inhabit are ill modeled...To strengthen work with institutions in participatory development, a much better understanding is needed of local norms of decision-making and representation, of how these change and are negotiated, of how people may indirectly affect outcomes without direct

participation. How far do the participatory forums that are promoted through development accommodate such complexities? (Cleaver: 602)

Although it is often assumed that in the face of participatory decision-making there is an implied existence of greater efficiency, effectiveness, democratization and empowerment, however, it is often the case that, despite of increased participation, there is little direct evidence of the improving the position and life conditions of the most marginalized populations of society.¹³ It is important to note that participatory decision-making is not the same as equality of representation and decision-making power. Participation is a means of initial empowerment, but does not equate to equality by any means. For example, a group may be represented in a water allocation committee, however, their power within the group is dependent upon, and easily manipulated by, many factors including: voting rules, transparency of decision-making, access to information, voting environment, knowledge base, cultural bias, percentage of representation, alliances within the groups, etc. Furthermore, as is shown in the following quote, there are certain parameters under which participatory approaches to management are more plausible and/or effective than others:

According to theory, collective action is likely to succeed when the group size is small and when group members interact frequently, communicate easily, and share common values and beliefs. The larger the group of beneficiaries, the less likely the service will be provided optimally through collective action. In general, collective action for nonrival and nonexcludable goods will yield suboptimal provisions (Isham et al: 100).

Thusly, there is a subsequent inherent falsehood equating benefits and equality with participation. As heretofore mentioned, there are many factors that are involved in participatory decision-making and the power struggles, alliances, advantages/disadvantages, and difficulties within. This is particularly true when the focus of the decision-making group is natural resources. Standing alone, natural resources bring with them many complicated variables, including their inherent systems and, as was discussed in previous sections, the variety of

¹³ Cleaver (1999) p.597

perspective and discourses surrounding the resources themselves (let alone their use) within and across cultures. To further complicate matters, natural resource management often not only includes complex national issues, but the resources themselves often cross international boundaries, bringing into the discussion many more players with increasing diversity of perspective, interests, and positions. Furthermore, it is questionable as to whether equal participation of all sectors would be considered 'positive' in regards to the long-term sustainability of natural resources. Overall, the trend in decentralization of water resources and the growth of the participatory approach needs to be carefully monitored and questioned in order to ensure the most equitable allocation and efficient use of resources, particularly in regions where the resources are sources of contention and are limiting.

There is also an inherent conflict of interests often associated with the two primary goals of participatory approaches: efficiency and empowerment. In many ways, this conflict serves as an example of the issues regarding the synthesis of varying systems: cultural, ecological, political, and economic. Furthermore, the inclusion of more sectors of society will also bring with it varying social inequities and biases. Although this is certainly true that democracy better approaches concepts of equity, however, with the inclusion of social capital and individuality, there comes increasing complexity of interests and goals. Does increased representation actually lead to increased levels of development on the local level? Regional? National? International? As is discussed in Cleaver, there are distinct differences between the concept of the individual behavior acting in self-interest and acting as a member of a particular society and culture. There are such differing patterns, however, of the interactions between individuals and social structure and one format for community or individual participation in one system or culture would not necessarily be either efficient or equitable in another system/culture. Furthermore an increase in participatory decision-making involves increased levels of cooperation and/or non-cooperation between members and associated groups.

One example of structural and cultural complexities of participatory decision-making is the Water Allocation Committees in the Northeastern State of Brazil, Ceará. The State and Federal governments have instituted these boards due many factors including external pressure from international funding institutions such as the World Bank. Within these Committees there are a diverse array of interested parties including representatives from Civil Society, Water Companies, Municipal Government, and State and Federal Agencies. Within each of these groups there are communities and individuals with very differing priorities and needs for water use. Furthermore, it is often the case that groups do not vote within their representative groups, but are often likely to vote based on geographical distribution within the watershed and in relation to the reservoirs. Furthermore, although there is a means for consensus voting in the participatory decision making approach, which would be presumably the most 'democratic' and 'equitable', civil society would get a greater amount of voting power in many ways with pure majority vote rules.¹⁴ However, in a simple majority rules system, the state and federal government agencies would lose their voting power. This participatory system is a primary example of one that *appears* to be shaped in order to promote increased equity, but is not structured in a way that gives an equal amount of representation and voting power to the participants who are the most vulnerable, civil society. In many ways participatory management aims to further decentralize decision-making, however, as was seen in the Ceará example, the systems are often structured in a way that not only ensures the relative power of the state or federal governments, but also mimics these very bureaucratic structures.¹⁵

¹⁴ I go into the analysis and methodology behind this assumption in "An Empirical Analysis of the Power Structure and Optimization of Water Allocation in the State of Ceará, Brazil", where Shapley Value Game Theory Analysis is used to analyze the structure of the Water Allocation Committees.

¹⁵ Cleaver: 601

There are also arguments as to how international aid agencies should approach participatory programs. Unfortunately, as is outlined in the example of irrigation farmers, the structure and stipulations of aid packages are often detrimental to already-existing social patterns and relationships:

The construction of permanent headworks has frequently been funded by external sources, with farmers not required to repay the cost of this investment. This type of external "aid" substantially reduces the need for mobilizing labor (or other resources) to maintain the system each year, a reduction that has normally been interpreted in project plans entirely as a benefit. However, this claim of undiluted benefit is made too quickly; the construction of extensive infrastructure facilities without requiring that capital investment be paid back by beneficiaries has two adverse consequences. First without a realistic requirement to pay back capital investments, farmers and host government officials are motivated to invest in rent-seeking activities and may overestimate previous annual costs to obtain external aid. Second, this form of aid can change the pattern of relationships among farmers within a system, reducing the recognition of mutual dependencies and patterns of reciprocity between headenders and tailenders that have long sustained the system (Ostrom et al: 104)

The following example is reflective of how international aid organization are often not attentive to working within local structures, understandings, and systems, thereby decreasing the legitimacy and efficacy of their programs. This is reminiscent of personal research experiences in the rural mountainous region of Fondwa, Haiti. The year before doing my field research there, there had been a USAID anti-soil erosion, terrace-building initiative in the region. Workers from USAID came to the region, hired local workers (the local population is among the poorest in the world) and had them build stone terracing structures, which has been designed by USAID engineers, throughout the region to help combat dramatic deforestation and subsequent soil erosion. However, because local members of the community were both paid for their involvement in the project and neither included in the development of the initiatives, nor was the project sensitive to traditional farming and land-use patterns in the region, by the time I arrived in the area (approximately one year later), the terraces were destroyed. The approach that USAID took to giving "development project assistance" was lacking in both local collaboration, but also in understanding of the necessity of

the participation of local communities and farmers in the project in order to maintain and implement the potential benefits. This example shows how a “top down” approach to natural resource management, when not adequately integrated with local custom, understanding and existing structures, is detrimental to both the empowerment of these communities and efficiency of resource use and allocation.

In this section, I have looked at how participatory approaches to resource management can both successfully and unsuccessfully pursue the goals of more equitable and efficient use and allocation of natural resources. In the following section, I will look specifically at the nature of water resources and the role participatory systems can play in the use of these resources.

The Struggle of Water: Water Resources and Participatory Systems

Water development in our time is driven by population growth and technological advances such as hydroelectric generation and modernized year-round agriculture...rapid population and economic growth in many parts of the world are severely stressing natural resources, so much so that water is beginning to have a scarcity value and an emotional intensity resembling that of petroleum. (Rogers: 117)

In 2000, the global population without access to safe drinking water was approximately 1.2 billion, or 19 percent of the total population.¹⁶ According to World Bank reports, the definition of “safe water” is not necessarily defined by the actual quality of the water, but is more correlated with access and convenience of access, however, the two are often intermixed (i.e. greater access to water supply, greater quality). Furthermore, more than 200 river basins not only account for over 50% of the land area of the Earth, but simultaneously cross international boundaries.¹⁷

¹⁶ World Bank, 2003.

¹⁷ Rogers: 117.

The decentralized approach to water allocation and related services, as discussed in previous sections, has led to an increasing need to explore the potential roles of governments, institutions, participatory agencies, communities and individuals, and the role social capital can play in the water sector. Within this, lies the importance of incentives, both for the involvement of each of these sectors, as well as the background underlying these incentives.¹⁸ As was discussed in the first section, there are countless discourses surrounding water resources: perspectives on resource use, source, conservation, etc. In Cleaver's analysis of water management in Zimbabwe, he notes that the exclusion of these discourses in decision-making structures is frequent:

Researching community based water resource management in Zimbabwe it became clear that the idea of an administratively defined community little reflected the wealth and complexity of local networks of resource use, decision-making and social interaction. (Cleaver: 603).

The understanding of local discourses and interactions with water resources is one of the keys to better initiating 'successful' local participation. Furthermore, as Cleaver suggests, it is important to incorporate local structures, resource use and other attributes into institutional systems. There are many questions that need to be addressed in order to do this, including outlining the positioning of water resources within a society: is the resource free to all? Free to some? Is there a charge for use? Are there water markets or water-related markets in the region? How is access determined? What portion/which sectors of society have access to water resources? What is the quality of the resources?

¹⁸ Interesting quote to incorporate later?? *The most difficult problem that the program will face is to put in place suitable mechanisms for continued coverage of the costs of provision of improved water supply and sanitation. Typically, water supply and sanitation services in developing countries do not cover the costs-the average level of cost recovery for them is around 25 percent, compared to over 50 percent for power and over 100 percent for telecommunications. This makes private investment in the water sector much less attractive than the other sectors and furthermore, results in a system that deteriorates over time (capital expenditures are deferred due to lack of funds). That, in turn, makes people less willing to pay for the service and the situation gets progressively worse (Markandya: 10).*

There are misappropriation and inequities in resource distribution on all scales in most systems. It is this uneven allocation and exploitation (or destruction) of natural resources, that is the basis for increased incentives, regulations, and/or structural adjustments that encourage equitable use and allocation of these resources. At the same time, there has to be some way to allocate priority to the different end users groups. Who should make these decisions? Who has the power to enforce them? What goes into this type of decision? This is where there are many complexities associated with prioritization of resources, particularly in the participatory system. For example, in the Jaguaribe River Basin of Ceará, there are many different sectors that compete for limited water resources. These include human consumption, agriculture, industry, fishing, livestock, etc. Furthermore, there is a prioritization between the urban and rural allocation, with urban allocation of water to the capital of Fortaleza being of highest importance. To most, it would be evident why human consumption is the priority for the allocation of water. However, the reality of the region is that many people do not have access to water resources, particularly in rural areas. However, the populations in rural areas, even those without access to water resources, are approximately 79% employed in agriculture.¹⁹ Even those farmers who are dependent on rain fed agriculture for their livelihood in the rainy season are often simultaneously dependent upon irrigated farms for off-season employment.²⁰ In this way, although human consumption is directly associated with human life and survival, so too is water allocated to agriculture, particularly for the poorest of the region. This is particularly true in that the poorest of society do not have access to water resources, even for human consumption. There then is a distinctive tension between how priority is allocated, which is controlled by the State and Federal Government, despite increasing decentralization and participatory water allocation management. As Ostrom et al. point out in the following analysis of resource management, it is the complexities of inclusion

¹⁹ Governo do Estado do Ceará (2000), Census Data.

²⁰ Taddei, Renzo et al. (2004).

(and desire for greater control over national resources) that often lead to the monopolization of decision-making by higher, 'external' authorities:

The logical consequence of this view is to recommend that an external authority—"the" government—take over the commons. Further, where technical knowledge and economies of scale are involved, it is presumed that this external force should be a large, central government. Central governments are seen as necessary agents of change to break the control of powerful individuals in rural areas who under-invest in collective actions and obtain a disproportionate share of whatever is generated. Of course, recommending government action can lead to a wide range of policy interventions, from having the government impose a market, to recommending that national governments manage common-pool resources themselves. (Ostrom et al: 95)

This school of thought has led to the historical centralization of water resource management. This is particularly true in developing countries. However, this centralization is coupled with many inherent negatives as well. Particularly when there is a lack of transparency in the government and its' dealings, powerful sectors will still retain priority of resource allocation. Furthermore, many argue that the technical knowledge needed for water resource management, particularly on a state-level, is not available in most local populations and communities. Accompanying this argument is that government control will allow for the most efficient development of infrastructure and the most 'knowledgeable' systems approach to allocation. This argument, however, is biased against local knowledge and experience concerning their local environment and reflective of short-term thinking. If participation were coupled with increased education and outreach of technical bodies and institutions, then the overall efficacy and long-standing potential of water resources management programs would be greatly increased. As is emphasize by Isham et al, it would seem that the incorporation of community and individual preferences in the design, development, and implementation of water management strategies would lead to an increase in the efficiency and equity of the services:

Community-level social capital is likely to help community members to craft and enforce the service rules that govern the design, construction, operation and maintenance. (Isham et al: 102)

Furthermore, this dissemination of technical expertise would, ideally, be coupled with locally driven education and incorporation of local ideals, understandings, and knowledge bases into more formalized institutions. Overall, this would encourage a greater dialogue between differing levels of the populous. There is also a question of legitimacy of sectors: Does the government have international and/or national legitimacy? Do the local communities? Are there formal organizational structures for the poor? How much legitimacy do they have with the population they 'represent'? What are the 'knowledge bases' of these groups/structures?

Coproduction of water and sanitation services may overcome government failure by alleviating fiscal pressures on the government, providing a means of revealing community members' preferences, and increasing transparency and accountability within the government. (Isham et al: 102)

'Coproduction' can be equated with a participatory approach, but as was heretofore mentioned, the very definition of this leaves much room for interpretation. As is emphasized in the above quote, there are many potential benefits for governments and their institutions in pursuing a more participatory approach to water resource management.

To further complicate matters, in issues of water allocation and water quality within a river basin, geographical distribution of the population is often key to the incentive-base of participatory decision-making. Often, populations upstream have an advantageous position in terms of water quality and allocation from their downstream counterparts. For example, upstream farmers will be more likely to desire to release less water from reservoirs in order to ensure their water needs, resulting in little or no water resources for downstream populations. Accordingly, pollution from upstream users directly affects those located downstream. In this sense, there is often a power dichotomy between the upstream and downstream sectors: with the upstream population having natural resource access advantage over downstream neighbors. In many cases, it is the poorer populations who are

positioned in the disadvantaged “downstream” locations, which often leads to inaction due to social, political and economic power also associated with upstream populations. In these cases, either highly organized social movements from the poor populations or external intervention is needed to balance the inequities in resource use and allocation due to geographical distribution. However, particularly in the case of poor or marginalized populations being geographically located in upstream waters, there is much potential for incentives and environmental service initiations and structures.

Water used in river basins has the interesting property that both positive and negative externalities usually have their effect in only one direction, that is, downstream. An upstream country affects the volume or quality of downstream country's water by diverting or polluting it, but the downstream country cannot do the reverse, since it has no access to the water until it has left the upstream country... The downstream partners must often balance the asymmetrical water relationships by the use or exchange of resource from outside the water domain, for example, economic or military power, in the upstream direction (Rogers: 118).

As was previously mentioned, this unidirectional nature of water causes inherent inequalities in the populations located within and around the watershed and calls for external forces to create greater equity in the exchange. Although the above quote emphasizes an exchange of military or economic power exchange for resource-related rights, I would argue that there are more direct, resource related services that can serve as the basis for exchange. For example, watershed agreements in the state of New York have used a variety of incentives for participation in and upstate cooperation in improved and safeguarded water quality for the city. In New York City, due to Federal-level government enforcement of the Safe Drinking Water Regulations, there is the need for a watershed Memorandum of Agreement (MOA) or filtration program for the City's drinking water supply. Due to costs, NYC chose the Watershed MOA as a means for filtration avoidance. In addition to this, the voluntary participation in the program is due to historical conflict in the region over issues pertaining to water resources, between downstream populations of the City and upstate, rural

populations. Although the intense amount of institutional and financial resources available through NYC are critical to the success of the program, the example of downstream/upstream partnership and some of the incentives supporting this relationship are broad-reaching in scope and application value. The types of incentives and services rendered in the Watershed MOA are directly influenced by the intense amount of infrastructure development and financial resources within New York City. Furthermore, the historical conflict between involved parties created the need for “alternative” methods of water *quality* enhancement and insurance.

As is exemplified in the NYC example, the geography of the watershed in relation to the demographics of the population is key in the structuring of agreements; In this case, upstream watershed populations are predominantly rural agriculturalists with subsequent lower average income amounts, and the city population is not only “downstream”, but represents an intensely urban, disproportionate amount of the state population and income. Economic incentives and instruments for water quality management in the region have been used to encourage the participation and economic development of the rural, upstate populations.

In this section, I have explored a diversity of issues concerning participatory approaches to water resource management including: Arguments for and against both decentralization and centralization of water management; A need for the focus on the actual structure of participatory systems; and The geography of water resource management. In the following section, I will conclude with final thoughts of the current status of natural resource management and some suggestions as to how we can better incorporate equality, efficiency, *and* sustainability into the management of these resources on local, regional, national, and global scales.

Conclusions: Where are we? and Where are We Going?

In this paper, I have looked at many of the links between natural resource management, the use and allocation of them, and the decision-making structures related to them. As was emphasized in all of the sections, there is an inherent need to understand not only the ecological systems and human systems at hand, but to better understand the overlaps, discourses, and perspectives ensuing from the interconnectedness of these systems. The relationship between resource use and a person's economic position within society is under debate, however, few debate that the world's poor almost exclusively have limited access to natural resources and are often subject to the decisions of more powerful (social, political, economical) sectors of society in these and other matters. Subsequently, there has been an increasing trend in the decentralization of decision-making bodies concerning the allocation and efficiency of use of natural resources. However, as was argued throughout, there are many ways to construct a participatory body: Some ways, which *do* encourage these long-term 'goals' of equity and efficiency; and Some which, although they mimic democratic processes, do not actually place disadvantaged groups, including the poor, in better situations in regards to available natural resources. Furthermore, we have seen briefly how the bi-directional dissemination of knowledge concerning natural resource and related discourses are beneficial to local populations and to applicable governments and institutions. When specifically looking at water resources, we have seen how there are aspects specific to them that further complicate management structures. With increasing stresses on freshwater supplies throughout the world, there is bound to be an increased need to understand the particulars of these systems.

Overall, natural resources and the management and control over these resources are one of the greatest sources of power in political, economic and social systems. However, it is important to note that these systems are not 'controllable' by man, but are part of natural systems, flows and processes, on which our very existence depends. Undoubtedly, development towards the greater understanding of the overlapping nature of both environmental and social

systems will help us to create methods for the sustainable use of these resources. International agencies can serve to help integrate both the interests of sustaining natural resources and improving the status and lives of marginalized sectors of society, by abandoning “blanket” approaches to participatory management and emphasizing the need for the development and monitoring of systems that are socially and ecologically inclusive. Multi-level approaches to resource management are likely to be more equitable and efficient, but as was emphasized in previous sections, the *appearance* of equal participation and ‘fair’ positioning of different sectors is often questionable, even within participatory systems.

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