

Ecological and Social Monitoring of Protected Areas in an Era of Globalization

Paper presented at the Biennial Conference of the
International Association for the Study of Common Property
Victoria Falls, Zimbabwe
June 17-21, 2002

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Abstract

Conservation strategies based on the designation of Protected Areas (PAs) are increasing in popularity worldwide, however the concept of PAs is also encountering growing criticism over an apparent lack of consideration for or awareness of local people and their interactions with the natural environment. Criticism of traditional PA establishment and management has led to attempts at more "people centered" conservation approaches, such as Integrated Conservation and Development Programs that incorporate local people into conservation policy and management and link PA conservation programs to local economic and social initiatives.

Recently these people centered approaches have come under an attack of their own by critics who believe that these programs have either not worked (the goal being the preservation of biodiversity) or their reported successes have not been supported by data from ecological monitoring. This paper argues that in order to more effectively and realistically analyze policies and management projects involving local people and PAs, there is a need not only for sound ecological monitoring but also for social monitoring which provides data on the social consequences and changes connected to specific conservation strategies and PAs. Rigorous monitoring programs involving multiple techniques of data collection (from ecological field work to household surveys to in-depth interviews to remote sensing) will provide the type of comprehensive data necessary to analyze trends in and around PAs resulting from human and ecological change at the local, regional, and global level.

Two case studies—the Colorado Plateau's San Rafael Swell in the USA, and the southeastern slope of Tanzania's Mount Kilimanjaro—are utilized to demonstrate both the need for a broader range of data in analyzing the integration of local people into PA conservation and how multiple techniques provide data useful for understanding both ecological and social events and their association with specific outcomes in conservation strategies and PAs. These research strategies improve understanding not only at the local level but also at national and international levels. By using multiple research techniques for ecological and social monitoring, the way in which local-level issues are linked to globalization and other macro forces can be understood within a fuller context and broader conception of the conservation situation.

The Need for Ecological and Social Monitoring of Protected Areas

The establishment of National Parks, Wilderness Areas, Wildlife Reserves and other Protected Area (PA) designations has rapidly become the strategy of choice in the struggle to conserve the globe's diverse ecological heritage. Following the establishment of Yellowstone as the world's first National Park the idea has become so popular that by 1997 over 21,000 of the most restrictive PAs (IUCN category I-III) covering over 11 million square kilometers had been established worldwide (Paine and Green 1997). In recent years this aggressive pattern has come under critique from those concerned about the exclusion of local communities in the designation and management of PAs. Concern stems from impacts on livelihoods and lifestyles (Neumann 1998; Shiva 1989, 1991), customary rights of access and use (Schroeder and Surynata 1996; Carney 1996), and the viability of policies and management lacking input and support from communities surrounding established PAs (Neumann 1998).

This concern has led to a rise in Integrated Conservation and Development Projects (ICPDs) and other initiatives which attempt to link ecological outcomes to socio-economic agendas (Stocking and Perkins 1992, Owen-Smith 1993, Little 1994, Alpert 1996, Ingram and Lewandroski.1999, Abbot and Thomas 2001). These social-ecological efforts have themselves come under scrutiny. Ecologically-based critiques question purported successes in preserving biological diversity in the absence of data collection and call for the establishment of rigorous ecological monitoring in and around protected areas (Newmark and Hough 2000). There is a growing insight that it is the frequency, rate, kind, and degree of change that must matter in the analysis of human environmental change (Botkin in Zimmer and Young 1998: 7).

While ecological monitoring can provide a better understanding of the natural environment

where conservation strategies will take place, these environments are almost inevitably connected with people, communities, and economic and cultural lifestyles. Without taking local people into account, the best ecological understanding of an area cannot guarantee successful conservation. In addition, local populations often have processes in place for environmental protection because their lifestyles, livelihoods, and traditions are closely connected to their surrounding environment (Shiva 1989; Sachs 1992). Without collaboration with local populations, restrictive conservation strategies often alienate the very people who have the most to gain by protecting the environment and foster a feeling of helplessness which leads to resistance and even open opposition to conservation strategies (Neumann 1998; Durrant 2001).

A better understanding of social and economic conditions of local populations is the first step towards avoiding such opposition between groups whose aims can often be mutually compatible (Zimmerer and Young 1998). Social monitoring can help national and international environmental groups avoid stereotyping local populations as ignorant and wasteful. Understanding the social and economic concerns of local populations in connection with protected areas can help identify key points where collaboration and negotiation can take place. However, accompanying ecological data is vital to such negotiations, so that the end goal of ecological conservation is reached.

This paper addresses two major concerns for ecological and social monitoring: 1) the challenge of linking social and ecological data collected from divergent collection and analysis approaches; and 2) the impacts and implications of social and ecological processes that extend beyond the immediate region to globalization. These concerns will be addressed by promoting geo-referencing of qualitative data as one possible method of linking data together and by examining two research projects where this method is being utilized. Additionally these case studies help to

illuminate the impacts of globalization.

Geo-Referencing Qualitative Data

Definitions

Qualitative Inquiry has been defined as research that produces findings not arrived at by means of statistical procedures or other means of quantification (Strauss and Corbin 1990). It focuses on people's experiences, opinions, feelings, knowledge, behaviors, and interactions (Patton 2002). Qualitative inquiry is very useful for exploring patterns of behavior (Whyte 92), and one of the greatest benefits of qualitative inquiry is that the experiences and perceptions of the subjects are placed at the center of analysis rather than the researcher's formulation of the problem. This form of data gathering is very useful when dealing with populations who may have been misunderstood, whose experience and environment differ greatly from the researcher's, or who may formulate a problem and its solutions in an unusual or undiscovered way.

Geo-Referencing involves attaching locational information (such as latitude/longitude, x-y coordinates) to data to create geographic features and/or surfaces. It can also entail linking data to geographic features and/or surfaces. Geographic features are objects with size and shape such as mountains, rivers, buildings, forest areas. All geographic objects can be represented on maps as either points, lines, or polygons, ie. "Vector data." Geographic surfaces refer to data that has no distinct shape but which possesses instead measurable values for any particular location on the earth's surface such as temperature, precipitation, slope, elevation, etc. Raster data is the most common form and is a matrix of identically-sized, square cells.

Applications

There are two compelling reasons for geo-referencing qualitative data. First, multiple methods of data collection bring added insight to specific research problems, and there are a growing number of research questions and projects that utilize multiple methods of data collection. For example, research on land use and land cover change increasingly attempts to connect remotely sensed data (satellite and air photos) to a wide variety of data ranging from population censuses to land use observations and household surveys. The difficulty with these mixed-method approaches comes in linking the data--particularly linking inherently geo-referenced data (remote sensing) with data that is rarely geo-referenced (National Research Council 1998). But such linkage enhances both social and ecological data.

Second, geo-referencing qualitative data brings increased depth to the data by adding another layer of information that can enhance analysis. There are benefits both from a Geographic and Ethnographic point of view. There are three specific areas where geo-referencing qualitative data allows integration of Geographical traditions and theories.

- 1) It allows the researcher to discover and demonstrate spatial relationships, which in turn allow for spatial analysis. This draws from Geography=s Spatial Tradition.
- 2) Connections to physical and environmental data become possible. Such data is often geo-referenced or allows for geo-referencing. This connects with Geography=s Human-Environment Tradition (also known as the Man-Land Tradition).
- 3) The ties of individuals and populations to a specific place can be mapped out and analyzed. Because these ties involve geographical features and surfaces as well as social, moral, and economic processes, the combination of qualitative data with physical and environmental data will broaden understanding of how, where, and why such ties exist. The discipline of Geography has produced a

substantial body of literature on Place and how it both affects and is affected by human populations.

From an Ethnographic perspective, geo-referencing qualitative data brings another level of understanding to the data. Ecological processes and change can be used to understand and interpret ethnographic data, which is selective by its nature. Geo-referencing also allows the inclusion of data that is more easily measured, verified, and quantified in the analysis of qualitative data. A common criticism of qualitative data is that it is too abstract and lacks the rigor of standard quantitative measures. By linking qualitative data to specific environmental features and changes which can be spatially represented and measured, the qualitative data becomes more compelling. What some regard as *the light, fluffy stuff* may become more acceptable in certain sectors when linked with *scientifically* measured ecological data.

Certain inquiries more obviously lend themselves to the task than others. Investigations of land use/designation and other human-environment research are perhaps better suited or at least more obvious than others. Because of the important connections between local populations (who are often misunderstood) and environmental change and perceived degradation, qualitative data on these topics gleaned from interviews and observations can readily be connected to geographical objects represented as points, lines, and polygons (vector data) and perhaps even to geographical surfaces (raster data).

The two case studies below demonstrate how such data has been or will be gathered to strengthen understanding of research problems involving protected areas and local populations.

Utah=s San Rafael Swell

Background

Although the San Rafael Swell is a region absent of permanent human habitation, it arouses great human interest, and members of several adjacent communities feel personal connections to the region. The variety of sandstone buttes, pinnacles, slot canyons, and other natural wonders along the locale of public land grazing and sporadic mining efforts are increasingly the focus of outdoor enthusiasts and environmental preservation groups. In the early 1980's a United States federal land management agency, the Bureau of Land Management (BLM), designated six Wilderness Study Areas (WSAs) in the area totaling over 250,000 acres, making them future candidates for Wilderness designation by the U.S. Congress. Wilderness designation involves a set of regulations which greatly restrict human activities, including mining, cattle grazing, and motor vehicle access. While waiting for possible formal Wilderness designation by the U.S. Congress, the region=s WSAs are managed with a mandate to preserve the "Wilderness Character."

The establishment of the WSAs has resulted in conflict (Durrant 2001). Pro-Wilderness groups (national and international) are unhappy with both the management and the extent of the WSAs and have created lawsuits and new proposals to push through the vision of their increasingly popular and politically-powerful group. On the other hand, some local individuals and community groups (led by the Emery County government) have fought against the rising tide of designations seen as restricting both potential economic growth and their historic access and use of an area widely ignored until recent years. Ensuing battles over the region have become increasingly political in nature, focusing mainly on the issue of roads, a key defining point of Wilderness in the Wilderness Act of 1964. The issue of roads has almost overwhelmingly overshadowed other ecological concerns, and there is very little attention to ecological and social data in making land management decisions.

While some maps have been produced by the powerful environmental lobby, they have little ecological data to back up their claims of land degradation in the San Rafael Swell. Their arguments rest mostly upon perceived degradation, and may even shift to minimizing the degradation in certain contexts (Durrant 2001). Additionally, their lack of attention to the social context of the area leave little hope that their plans for management can be effectively implemented.

The local community feels increasingly powerless, as several attempts to gain control in management of the San Rafael Swell have been repeatedly defeated by the powerful environmental lobby. They too have produced maps to support their claims, but without ecological data to show that the region will not be further degraded, their initiatives hold little sway with environmentalists. They have also not been successful in overcoming the stereotype of locals as ignorant and wasteful.

Geo-Referenced Data

In the Struggle over the San Rafael Swell a substantial amount of qualitative data (observations, life histories, etc.) is being connected to the various maps being produced. For instance Emery County has been active in documenting numerous backcountry roads by sending out workers who travel the roads with GPS equipment to assist in mapping, and spend time recording interviews with residents involved in the historical development and use of these routes. The purpose of this tremendous effort is documentation for expected legal challenges to the county's assertions of these routes.

Our research has focused on utilizing this information in combination with data gathered from extensive interviews and participatory mapping activities with ranchers who run cattle on BLM allotments in the San Rafael Swell. We first created maps with two key layers showing the overlap between allotment boundaries and WSA boundaries. Each allotment that overlapped at all with a WSA boundary was selected as part of the study site. From the BLM a list of ranchers holding permits on these allotments was obtained. Of the approximately 50 ranchers on this list, 38 were informally interviewed over the phone (the ranchers not interviewed were primarily unavailable due to out-of-town jobs or who were no longer working the specified allotment). Following these interviews 14 ranchers were randomly selected from the list for follow-up in-depth interviews in Emery County. These interviews centered around the broad research question of "How has the establishment of WSAs impacted ranching livelihoods and lifestyles in the San Rafael Swell?" These interviews were then followed up with interviews that focused on the central concept of how vehicle access had been altered. For these ranchers vehicle access centers primarily on managing and developing water sources for their livestock in the extremely arid region. These interviews included the use of topographic maps containing the allotment boundaries. Each rancher drew

access routes on the maps and identified the allotment water sources. Water sources consisted of human-constructed stock-ponds, natural springs, and water tanks.

We are currently processing this data with the goal of connecting attitudes, experiences, and opinions of the various ranchers to the physical and management characteristics of the various allotments. For instance, in one interview a rancher expressed a surprising level of acceptance with the fact that most of his allotment was within an existing WSA. He even went as far as to suggest that if he were banned from all vehicle access he would be fine with that. Later he was drawing access and water sources on a different allotment and when it was mentioned that this area was all proposed wilderness he expressed concern and was very against the notion that he operations could survive without maintaining the existing vehicle access. The difference between the two attitudes was relatively clear when the maps were more closely inspected. His water sources in the first allotment were primarily natural springs in remote canyon, on the other hand the other allotment depended on constructed stock-ponds as water sources—stock ponds that required periodic machinery to maintain.

Tanzania=s Mount Kilimanjaro

Background

Mount Kilimanjaro, a dominant landscape image of East Africa, was discovered long ago by the Chagga people who have been farming the mid-slopes for at least four hundred years. More recently the 19,340' (5895m) mountain was discovered by the European world, and in 1889 Hans Meyer led the first known ascent of the mountain. A colonial era game and forest reserve, the upper slopes (above 2,700 m, 8,910') of Mount Kilimanjaro were designated a National Park in 1973 and

officially opened for tourism in 1977. In 1989 the World Heritage Convention designated the area as a World Heritage site. All the land above 6,000' is now a designated Forest Reserve. While tourism has brought increased revenues for many of the local people, the boundaries of the park have also accelerated overcrowding in the region. The Chagga tradition of a father passing on land to his sons who in turn provide land for their wives is now being challenged as available land is being divided into smaller and smaller plots. With increasing pressures on the land from growing population, increased demand for commercial farming, and the National Park, there is a growing perception of increasing degradation within the National Park (Newmark 1991) as well as increased social pressures within the local communities (Grove 1993). However, there is little ecological or social monitoring to explore the extent or nature of these increases and how the National Park is both affecting and being affected by the local populations.

A survey of local mountain guides and porters conducted in 2001 shows evidence that the lack of available land in Kilimanjaro is driving many Chagga farmers to seek land elsewhere. In addition, the tradition of family farms with diversified crops which are more environmentally friendly is being threatened as land plots become either too small to farm or are taken over by large, monocrop commercial farming systems. The impact of these population and agricultural changes on such factors as water flow, land cover, and social processes and networks have been theorized but not extensively documented (see Newmark 1991; Grove 1993).

Geo-referenced Data

Beginning this summer (2002) a research project is being undertaken which will study land and water use patterns in a specific water basin on the south-eastern slope of Mount Kilimanjaro. This study will combine maps created with GIS and GPS, water flow measures, and social data

collected through interviews, observation, and ethnographies. Social data will be gathered with focus on local attitudes about the national park as well as land and water use. Local perceptions about these topics can be compared and contrasted with ecological data gathered. The qualitative social data can be connected with land and water use data through geo-referencing to allow analysis of how social and ecological forces interact. Such an understanding will contribute to a more accurate depiction of the ecological changes in this region as well as how the local community is connected to and affected by these changes.

This will be a long-term research project in collaboration with local officials from the National Park as well as government employees involved in water monitoring. The resulting data will provide a clearer picture of where there are current problems, where such problems may be likely to develop, and how local communities and individuals can be involved in solving these problems. Because local farmers are affected by ecological changes such as water flow, their understanding and input on these processes will bring valuable insight to the process.

Increased Understanding of Globalization Processes

Although situations involving local communities and PAs are complex and diverse, the effects of globalization are bringing increasing homogeneity of designation and management approaches combined with decreasing local control. This combination cannot lead to effective preservation of either environmental areas or local communities and cultures. However, as Roe (1991) argues, development and conservation strategies are often based more on narratives than facts and research. Because PAs are so closely connected to and impacted by the local context where they are established, it is vital that they are not guided by mere narratives developed by the strong arm of global forces. A better understanding of the social and ecological context of a PA can aid in the development of more effective design and management strategies which will in turn facilitate preservation of important ecological and human processes. In addition, connecting the narratives of the locals with the environmental changes taking place may contribute to the recognition of members of local populations as important players who should be included in the design and management of PAs. This is an important step because human sustainability . . . will depend on more than environmental conservation and less on economic growth. It requires preservation of community in inclusive terms rather than the exclusive or specialized terms of economic globalization (McMichaels 1996: 257).

The two case studies presented in this paper are affected by some of the same global processes. Global economic forces often allow specific groups to wield disproportionate influence. The global acceptance of economic growth without regard to social consequences often drives local and national governments to make decisions which benefit big business or Western interests at the cost of local populations (Polanyi 1944; Logan and Molotch 1987; Robbins 1999). The lure of

tourism often plays on such attitudes. Displacement or loss of power for local populations is justified by the promise of economic benefits. The environmental movement is another global force which holds increasing sway over land use decisions. Western ideals of nature and beauty are embodied in environmental preservation movements (Neuman 1998). This movement removes land from local control and makes it available for the consumption of outsiders in the form of tourism, hunting, and site-seeing. Sachs (1992) puts it bluntly: "Calls for securing the survival of the planet are often, upon closer inspection, nothing else than calls for the survival of the industrial system" (35). Heavy-handed and restrictive management plans continue the global pattern of taking power from local communities and placing it in the centralized hands of government and political bodies.

Although these global forces are powerful and often hegemonic, the use of sound ecological and social monitoring connected through geo-referencing can give some power back to local communities and those who work with them. Global narratives can be combated with rigorous data which takes local context and understanding into account. Local and traditional knowledge can be represented in a form which is understandable and compelling for a global audience. This type of understanding can help put to rest unfounded assumptions supported only by global impetus and economic interests.

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