Section II: Interactions of Knowledge Forms in Conservation Discussion and Comments

DISCUSSANTS

Serge Bahuchet
LACITO/CNRS

Diane Doran
SUNY, Stonybrook

Edmond Dounias
IRD Montpellier

Sarah Elkan
University of Minnesota

Eric Worby
Yale University (Moderator)

Serge Bahuchet, LACITO/CNRS: These papers show brilliantly the biodiversity that composes this region, where all the areas within the region are different, one from another. This diversity evokes another important reality for the understanding of this immense region: a large number of communities, ethnic groups, and languages, correspond equally to the representation of different environments, different economies, and different histories of interrelations.

The notion of scholarly knowledge versus indigenous knowledge remains open to debate. What is indigenous knowledge? What I appreciated in Zéphirin Mogba's and Mark Freudenberger's paper is the demonstration that these forms of indigenous knowledge are not fixed, or static, but have evolved. One can see how communities integrate modern technology according to their needs, how they integrate economic knowledge with their different systems of traditional economics to make economics that is not traditional, but is functional in the formal sector, in systems of credit and exchange.

More specifically, these different knowledge systems interact with, and give rise to, distinct management systems, as Joiris notes in this section. This interaction means that very distinct regimes emerge for the circulation of goods and different relationships of territoriality, many of which have a logic different from those in the western world. Joiris also shows the relationship between cultivated areas and the use of space for hunting, gathering or other activities. The thing to remember here is the relationship between soil types, crop types, and the overall appearance of food production systems

may be complex and spatially scattered, connecting roadside villages to camps in the forest where farming and other activities are mixed in complex ways. One point not made in Joiris's paper, but made in her work on the Dja reserve concerns communities' claims to territories that they have used in the past as forest camps or burial grounds. Such sites, not obvious from the side of a major road (where large village bases do exist), are connected to other sites of cultural importance within the forest, such as burial sites or former village sites that escape detection by remote sensing due to re-growth, but which have enormous importance in the territorial relations of the region's residents.

More specifically, with regard to the interaction between such systems and policy in protected areas, I would like to provide an example. The question of limiting agricultural activity in protected areas to a radius of five kilometers from the edges of major roads seems to me somewhat arbitrary, and based on a single-minded consideration of farming, but not of forest product use patterns. Even purely in terms of agricultural production, does such a measurement account for the particularly long fallow periods known in these agricultural systems, and their spatial characteristics? Often, for an accurate assessment of a particular family's needs, one must consider not the land cleared in a single year, but 20 times that to allow for fallow periods that often, in this zone, can be longer than 17 years.

Recent research in Cameroon shows that agricultural practices are closely connected to forest regeneration patterns; in particular, the patterns of tree felling may influence animal movements in such a way as to effect the seed dispersal of plants such that they don't colonize land used for agriculture.

One last thought: recent research in Cameroon shows that agricultural practices are closely connected to forest regeneration patterns. In particular, the patterns of tree felling may influence animals' movements in such a way as to affect the seed dispersal of plants, so that they don't colonize land used for agriculture. In short, in these societies there is a very close relationship between agriculture and trapping. If we want to push that point, we could even say that fields are the giant bait at the center of a huge network of traps that surround it; it reminds me of the findings from Latin American systems of "garden-hunting" where there were limitations on the use of traps in proximity to fields. In terms of conservation goals, it might be better to permit such activity, and to limit hunting carried out deeper in the forest.

Diane Doran, SUNY, Stonybrook: We have heard very little about biological monitoring and how it is incorporated into the management plans for this area. Some of that is for the very obvious reason that people working in these different fields publish in different journals, work in different departments, and rarely get the chance that we have to be together talking about these trade-offs that often make us seem like combatants on two opposite sides of the prob-

lems. Roger Fotso's paper really stressed that monitoring across political boundaries is an important goal toward which we need to make more effort. Each of us works in a particular country, and even when we're working in areas close to one another, there's very little communication between people. The idea of trade-offs is mentioned, but we always talk about one issue or another. There is very little attempt to try to integrate these issues.

Edmond Dounias, IRD Montpellier: What emerges from case studies such as Daou Joiris's is that the populations in the forest are not traditionally people who have a specialized mode of subsistence. All of the studies show that a farmer in the forest is not strictly a farmer — he is a farmer and other things. A fisher in the forest is not always strictly a fisher. Therefore the principal characteristic of systems of production of populations in the forest is their diversity. That may not be obvious, but few actions in the domains of development and conservation have taken full account of this diversity. The "synchro-ecological" approach to the study of multiple populations operating differently within the same ecosystem does tend to emphasize the predominant activity at the base of their respective systems, that is to say, we characterize them as being either "fishers," "hunter-gatherers," "trappers," or "farmers." But if we look closely, in an "auto-ecological" approach to the study of one population operating within several different ecological environments, we see that those we had characterized as being "fishers" can seem to be "farmers" a few tens or hundreds of kilometers away. So there is a real combination of cultural characteristics, ethnic environments, and physical-environmental constraints that determines the predominance of one complex of activities or another, among one group or another. Globally speaking, again, what all have in common is diversity of the subsistence systems overall.

One also notes in the papers presented here that the arrival of new populations in the zone can really alter that diverse base, creating specialization, such as in the case of immigrants to the Dzanga Sangha region for diamond production. This can mean sudden specialization in corn crops for alcohol production near diamond camps, for instance. Many arrivals from north or west Africa are highly specialized in commercial activities. This rearranges the balance of diverse systems that already existed in the region. These dynamics merit further, explicit study.

Forest populations have a system and a diversification of that system that does depend on particular customary territorial relations. Joiris describes it as a series of concentric circles around a settlement, with the forest beyond. But these layers interpenetrate,

largely through mixed plantation practices and the mixture of hunting and agricultural spaces. Often we find old cocoa and/or coffee plantations where other species are planted—often selected species that produce products to attract mammals. The fact of agriculture layered on other resource exploitation systems must be born in mind.

One other important fact about the trinational region is the appearance of *Chromolema odorata.* This grass species is characteristic of conflicts about conservation that arise from varied perspectives—that of the ecologist versus that of the agronomist or of those populations who actively exploit the environment. It is a composite plant of American origin, introduced in Asia and Africa as a cover crop for plantation economies to improve soil qualities. But this species is extremely invasive, and its presence can provoke a dramatic decrease in species richness. So it is advantageous from an agronomy perspective, but quite villainous from an ecology perspective. Many populations who traditionally practice swidden agriculture conceive of it as a pest (and often call it by the name of African dictators, in fact. It is known as "Bokassa grass" in CAR, and as "Sekou Toure grass" in Ivory Coast. Examples of this are abundant. In the peripheral zones of Yaounde it is known by the name of Yaounde's central prison, to indicate that once one enters these grassy stands one cannot get out of them!). Yet, a study from the Tikar plains of Cameroon proves that among a savanna population with more perennial agricultural systems, this "weed" can be a positive player, improving soil quality and hence overall agricultural production on the same plots, reducing rotational fallow periods and allowing productivity on the same plot for seven or eight years running. So the same factor can have dramatically different effects depending upon the systems in which it acts. In the Sangha region people's integration of this into their systems will be important to understand.

There are, of course less ecological, more political factors at play. The mechanisms for evaluating regional agricultural productivity are based upon estimations of relatively limited arable surface per agricultural producer — indeed, projections exist for allocations of land per farmer. (I know that in Cameroon the commonly cited figure is somewhere around 1/3 hectare per person per year so there are projections through 2020.) But we know that these projections will only be met if itinerant farming systems are stabilized, and rooted spatially. In many senses such estimates are not based upon the realities of forest farming, but rather aspire to transform and harness forest farm production. A plant species such as *Chromolema odorate*, then, may realistically be contemplated as a potential political arm in such struggles.

Sarah Elkan, University of Minnesota: I want to discuss transnational monitoring and our need to address how monitoring is integral to conservation and development. I see it on different levels temporally. Monitoring is extremely important, especially in this region where we have infrastructure, and projects working to look at long-term monitoring, such as monitoring climatic change. But one needs to look more at the medium-term, to look at population distribution of larger mammals and migration patterns. One needs to look at the immediate-term to address similarities such as diamond mining and the changes of pressures that occur. To do such research would mean working with the same kinds of methodologies. While we're here together it's important to discuss and to think about what kinds of methodologies we use, and not try to reinvent the wheel when it comes to monitoring.

In Congo we are now feeling a lot of pressure from diamond mining, especially in the northeast. When we think about it, we haven't really approached the issue, it's a new thing to us. But hearing the people from CAR talk here and getting an idea of how you all are going about addressing the issue and how to monitor it, we can go ahead and use similar methodologies and see how it applies to our area.

The trinational region has, in all cases, a focus on what we call "mbais" or forest openings, and these areas are something that we have been focusing on monitoring. These openings seem to be something quite unique to our region.

Also in the situation that the Congo is in now, particularly in the Nouabalé-Ndoki area, we obviously see a great need for collaboration, and a great number of you are already collaborating with us. We have had a lot of really important exchanges of information due to the stresses that we've been through in the recent past with political conflict, making us more connected to CAR and Cameroon projects. This increased interaction among project staff has really brought us to a point that it's very nice to be here and to see the people that we've run into in the past couple of months, and to think about ideas for how we can work together.

Our focus in Nouabalé-Ndoki Park has been basically on monitoring in terms of natural science, and one of the things we are realizing about large mammal populations is that there is so much we don't know, and so much that is integral to protecting species. From first hand knowledge about bongo, what we're finding is that populations can be localized. But at the same time we're finding that populations migrate further than we had estimated. This has direct application for safari hunting, which again is something that comes up in the sense of monitoring. How do we look at these populations and their distributions, and how does that vary from country to country in the trinational region?

The trinational region has, in all cases, a focus on what we call "mbais" or forest openings, and these areas are something that we

have been focusing on monitoring. These openings seem to be something quite unique to our region. It would be interesting to look at how each country is training for the management of these small microhabitats, these small forest openings, where you have diverse species and abundant species coming into an area, and these species are attracted to successional growth or elements in the soil or in the water. How can we all look at these areas, monitor them, and come up with a way of protecting those located in the trinational area? Many of us who do research focus on these "mbai" clearings or openings. Because of the ways they attract animals it is integral. If we have tourism that we're setting up, or if we're doing research in terms of protection and looking at migration of populations, how we can come up with policies, how can we can come up with the means to monitor these "mbais" consistently throughout the trinational region?

COMMENTS, QUESTIONS, AND RESPONSES

Eric Worby, Yale University: I'd like to draw attention to one more paradox or contradiction. The language of policy, planning, and management always lends itself to a discussion of solutions that contains terms such as zoning, boundaries, borders. In fact this conference is about bringing together people from across borders because people are recognizing that, for example, large mammal populations, and usually people, don't respect legally-defined borders very much.

What we've heard from people who talk about the way local people themselves understand their economic lives, the constraints that they face, or what the research by social scientists and natural scientists has revealed, is that most of what we're looking at when we look at both non-human and human populations are strategies based on movement, flexible adaptation, and multiple forms of resource use that exist simultaneously, taking opportunities to move into new economic or natural resource zones as they become available or as they become necessary. If policy thinking is to move forward, it has to take this into account in a much more fundamental way. Something has to be abandoned: the idea that you can have specialized zones devoted exclusively to agriculture, to a certain kind of forest use, that is in such stark contradiction to the lived practices of forest peoples.

The powerful presentation of Rapid Rural Appraisal (RRA) by Zéphirin Mogba seems to reveal an enormous amount about a community that is very diverse after a fairly short period of research. At least it has superficially the appearance of a very open and demo-

cratic process in what must be a social situation characterized by secrecy, in a social setting in which knowledge is power. The difficulty of course is that one wonders where you, as researchers, as interveners, fit into that complex network of power. How is it that you were able to insert yourselves into this privileged position of being able to say "Let us open up all possible stories, all kinds of knowledge, to public inspection here"? What are the ethical kinds of conditions that qualify that kind of exercise, that make it difficult, or that make it important? How do you think that through?

Vincente Ferrer, World Bank: Yesterday, after listening to Urbain Ngatoua discuss his work at Dzanga-Sangha, I was actually kind of relieved. Here is something that is actually working very well. Wonderful. But after listening to the presentation that Freudenberger and Mogba made, I am actually very concerned. So that raises the question of what's actually happening? What is the future of conservation? What's happening in reality?

It's not for the government to grant *user rights, it's for the government to* recognize *user rights. The moment the government says "We grant you rights," by implication the government lays claim to control the ability to un-grant you those user rights.*

William Ascher, Duke University: I'd like to represent Owen Lynch who couldn't be here. The question has to do with governments granting user-rights to people who have customary rights. Owen pointed out that it's not for the government to *grant* user rights, it's for the government to *recognize* user rights. The moment the government says "We grant you rights," by implication the government lays claim to control the ability to un-grant you those user rights. So I'm curious if your notion of zoning is to recognize prior rights, or whether it is for the government to say these are the rights that we, as the government, are assigning here, and we reserve the privilege or the right to retract them later.

A related question is how much does zoning permit the complicated layers of user rights in an area? In the little I've read about relations between "pygmies" and Bantus, interactions are very flexible. Sometimes in the same area people will have rights to do different things. So sometimes the zoning is not what we think of in the west as "zoning," with one activity here and one activity there.

Vincente Ferrer, World Bank: About the question of conceptualizing borders, and of the concentric circles (village, agriculture, forest) described by Daou Joiris: what is the meaning of "forestry" in this context? In terms of customary rights, 15 kilometers, which is the figure that was mentioned as a possibility, means 25,000 hectares. Even at the level of forestry production in the Congo River basin, 25,000 ha is very low today. That is only five cubic meters/ha, which means 100,000 cubic meters of wood per year, give or take, depending

on whether you exploit everything. One hundred thousand cubic meters of wood per year, at an average of $100 per cubic meter, gives you $10 million. So the question is, are we proposing that each village in the Congo River basin is entitled to this amount of wealth? We should begin to think a little bit in economic terms about whether we mean access to the forest, so they can go there to collect medicinal plants, or are we talking about giving them the right to exploit 25,000 ha, which is about the size of a typical concession in Cameroon?

Catherine Coquery-Vidrovitch, University of Paris VII: And how are we deciding what "should" happen? What is this word "rational"? Rationality comes in multiple forms: ecological (maintenance of ecological systems); economic (production of economic surplus); social assistance (for the socially disadvantaged), cultural (respective culturally rational strategies, such as hunting, for "pygmies"). But the shift in what is economically, ecologically, or otherwise "rational" over time is also a clear indication that "rational" has a multiplicity of meanings. In Africa for hundreds of years westerners distributed firearms as fast as they could, prodding Africans to higher and higher hunting yields. Then, suddenly, between 1930 and 1950 there were interdictions on arms trade and hunting was outlawed altogether. Similar examples exist in French history, with regard to class histories of hunting rights and hunting regulations. We find that the distinctions between small and large rural landowners versus nobility or political élites is important. Also, as Joiris noted, the dissociation of hunting rights from modes of customary territorial management must be considered, perhaps as they have never satisfactorily been in many western histories. These proposed borders and boundaries within and between protected areas must somehow be supple enough to be effective, rather than provoking resistance and disregard for what is "rational" to various actors.

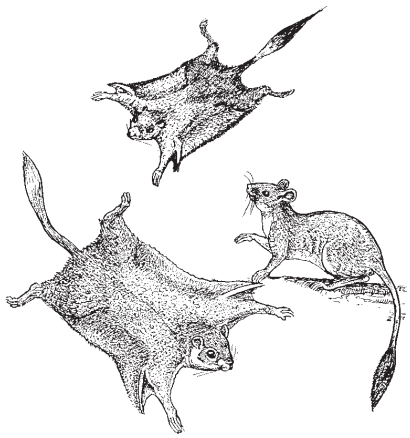
Daou Joiris, Free University of Bruxelles: As far as the term "rational" is concerned, I use the term as would an ecologist: patterns that enable a natural environment to reproduce itself. In response to Mr. Ferrer's comment, I must insist that we are speaking of use rights, and customary arrangements of that nature, not of land tenure. This is an important distinction.

There was also a problem raised about the question of limits: a questioning of the need for fixing limits, and of policy and planning proponents' fixation with limits. This is simply a reality of protected areas for reasons of zoning. And for the most part rural populations are very aware of these limits, for instance in the Dja region. People are quite capable of making the necessary changes, and of understand-

ing a conservation framework (particularly elders who remember times when faunal resources were more abundant).

What they fear, however, is repression, particularly blind repression that punishes certain activities over others. The real question, then, is what are the acceptable limits? The first study of this sort we did in Dja to get an idea of the size of the zone was quite delicate. The villagers had already heard tales of repression elsewhere, and were quite hostile and quite suspicious. It took enormous amounts of extension work and communication in every site we studied, enormous negotiation with the local population, to arrive at limits they could accept. In fact Mr. Mewondo Mengang participated in this experiment in a way, as we had meetings in Yaoundé with village representatives (chiefs and family heads) to try to convey the representation of the zone we had come to, a way of including them in the research findings. We wanted thus to test the relevance of our findings. This particular attempt unfortunately met with opposition, and didn't go on as a discussion across levels with the villages, as we would have liked. Nevertheless, the effort was made, which may have made a difference in the long-term.

The case of the Lopé reserve is even more serious than Dja. Now not a single study can be conducted; repression is too strong and many, particularly pygmies, have fled. Only vestiges now exist of the social systems that once operated in the area ten or fifteen years ago.



Anomalurus sp. (Illustration: Bernardin Nabana)

Allard Blom, WWF-CAR: It's a naïve concept to think that it's only the local population which is going to get "full protection" by changing strategies. You still need policing action as well. In any society there are always people who are against the general benefit of the whole community, so you always need a certain amount of enforcement. It's naïve to think that the villagers will undertake law-enforcement all by themselves, especially in these systems where the most pressure is actually coming from outside the region. And policing should especially be done in forestry concession areas that are usually very involved in poaching. They often don't pay their taxes or pay for the social services that they are supposed to, by the legislation of the country. I think that's where major problems should be addressed.

David Watts, Yale University: About the idea of forming teams to go to communities to discuss with people what their needs are, what their perceptions are, and to try to educate people to work towards long-term conservation goals: I think it's a wonderful idea, and I think that the WWF efforts in that direction are laudable. And Mr. Mogba has given us a revealing account about why a project like that can only go so far, and is not ever going to reach the goals set for it

without a lot of other things happening. People may understand very well what their long-term needs are, yet they're going to say their short-term interests are such that their survival depends on doing things that are contrary to these long-term needs.

How easy is it to generate particular versions of knowledge? Eric Worby made the comment that one important point to emerge from this session is that political boundaries don't necessarily mean anything when it comes to conservation, and that applies to non-humans as well as to people. Well, yes and no. We had another very nice illustrative example from Roger Fotso who talked about hornbills that move long distances and are important in seed dispersal, and about ecological linkages across a broad region that are independent of natural boundaries. But I'm sure that Dr. Fotso could also come up with very many species that don't have that kind of low-cost, long-distance movement, or that aren't ecologically flexible, certainly far less than our own species, and so suffer from forest fragmentation. And it would not be productive in a lot of ways if we started to say "Oh well, boundaries don't matter" because boundaries (or ecological tolerances) do matter.

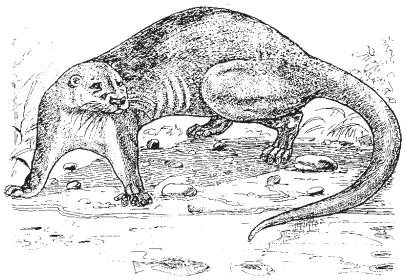
How can we possibly convince a local community to conserve something when they say, "But there's more elephants here than we can shake a stick at. Trees? There are tons of trees. Just look around you, there are trees everywhere!' And yet we're saying, "Oh yes, but that's only 7% of the global landscape." And they say, "Seven percent of the global landscape? What the hell does that mean?"

David Wilkie, Associates for Forest Research and Development: Most of the conflict that occurs between the international conservation community and local communities happens because the international community views these resources as globally scarce, and goes to local communities to say, "These resources are scarce, we've got to protect them." And local communities say, "Wait a minute, these aren't scarce, these are abundant!" There is this amazing paradox, and in that case there's bound to be a conflict between these two different perceptions. How can we possibly convince a local community to conserve something when they say, "But there's more elephants here than we can shake a stick at. Trees? There are tons of trees. Just look around you, there are trees everywhere!" And yet we're saying, "Oh yes, but that's only 7% of the global landscape." And they say, "Seven percent of the global landscape? What the hell does that mean?" So globally scarce resources and locally abundant resources are bound to bring a conflict between the means of a global biological conservation strategy and the subsistence needs of the local community.

Zéphirin Mogba, University of Bangui: About our social science methods and our roles in communities where we studied migration in Dzanga-Sangha: we did have training sessions before entering the communities, to master common approaches. There were various representatives from the layers of the Bayanga community who constituted teams for the AMPR study —"pygmies," logging em-

ployees, and others. The general procedure was to send small teams on reconnaissance into communities to announce our goals and objectives, and to negotiate the terms under which they would allow us to perturb their normal rhythms of daily life, within a broader seasonal calendar. The idea is to accomplish initial triangulation of actors and information to assess opportunities and modes of intervention and information collection. All of this happens before our stay of ten days to two weeks as teams within the communities we studied, eating with them, watching them work (or working with them), identifying target groups (women, older people, even children) who were least vocal so that we could send appropriate emissaries outside of group meetings to solicit information.

It isn't easy. Often people have misconceptions about who we are, and what we are really doing. Some mistook us for a group of refugees in flight! Others for meddling state authorities "under cover." When we ask delicate questions people withdraw their support, refuse us food, treat us with suspicion. If we have the bad luck to overlap in a mining camp with an anti-poaching patrol, the whole thing falls apart! For there are pre-existing tensions between such entrepreneurs and the conservation projects that predate us, and our research teams are caught in between. But often we are able, through honest discussion and our composure, to convince them. Sometimes people say at the beginning "We won't feed you anything but hot pepper sauce because you prevent us from killing animals, therefore you prevent us from eating meat, and we shall deny you meat as well!" But by the end they are open, even grateful to us for having initiated dialogue within their communities about their needs, their histories and their ongoing processes of development.



Aonyx congica (Illustration: Bernardin Nabana)

Eric Worby, Yale University (Moderator): What are the conditions under which people reveal knowledge? What are the politics of how knowledge circulates? There is no such thing as objective knowledge that all of us in international agencies, in governments, at the local level, can arrive at and then share, but rather the sharing of knowledge itself, as the creation of knowledge, is embedded in particular social relationships that themselves have long histories. If over the period of several generations people have been doing a dance with governing powers, where the implications of surviving by hiding what one knows are at least as important as managing what one reveals, the kind of goal in which everybody agrees on what is actually happening is going to have to be compromised.

Richard Estes, Species Survival Commission (SSC) and Wildlife Conservation Union (WCU): Dealing with people at the local level and winning their confidence is very difficult, yet I wonder if this

isn't possible to institutionalize, at least in terms of wildlife management, particularly wildlife management in terms of species like gorillas. Instead of training people to be game wardens, for instance, how about training people to go out and into communities to try to convince them that their long term ability to protect wildlife depends on establishing sanctuaries where wildlife can breed and where it is sustainable, in terms of having the surplus going out to the land. This could be effective if the people own the land and can take responsibility for it. One of the big problems of this whole conservation thing is that people have been told from the outside what they should do. Now there are some new conservation efforts going on in, say, Tanzania, where over a period of time they are letting the Maasai decide, like a workshop, getting together to share ideas: What do you think? What is the logical conclusion? And these people seem perfectly able to understand that if they keep on depleting a resource and more and more people are coming in, that eventually the resource will be gone. So what is in their own interest? My suggestion is that there might be a way of multiplying this kind of exercise by training these people especially to do this kind of thing. The logical place to do this would be with students.

Mark Freudenberger, WWF-US: This approach is exactly the strategy we used in the central African training program. We trained and exposed roughly 68 people coming from the conservation community as well as from local populations in these research and community participatory planning approaches. Many of the people who were on the team were indeed national park and forest authorities and some of them were even directors of the curriculum of these national and regional wildlife schools. So the Director of Studies of École de la Faune in Garoua was indeed a critical member of the team and is taking this approach and trying to institutionalize it in the curriculum of the École de la Faune. The École de la Faune has also been given land to try to set up an experimental pilot community management project where park guards will learn park planning tools to work with local communities as well as with powerful interest groups to try and set up a community management process as part of their curriculum at the École de la Faune.

Alec Leonhardt, Princeton University: About the relativity of knowledge in the research situation: I was visiting a village that Serge Bahuchet had referred to that was an abandoned village, already now isolated in the forest. It's long gone now, and the agricultural inhabitants have mostly left; only a few have remained. But a large variety of the Baka community was there. When my interpreter and

assistant spoke with the head of the Baka community asking him from his development orientation "What do you lack here?", the man gave back here a standard list: logging camp, road, dispensary, market, school. And I followed up on that because I was curious about why, as mobile as the Baka are, they had not also moved to the road as their farming neighbors had. And he replied "Oh, we have no reason to leave here, it's fine here."

William Ascher, Duke University: I'm very curious about what the status of individuals was before coming to work in diamond mines. Why would someone move to such abject conditions? Possibly their conditions before were even more abject? But it puts the whole situation in a different light.

Daou Joiris, Free University of Bruxelles: An example from the Parc National Odzala (and, again, my analysis is situated at the local level), we have villages of local, not immigrant, populations engaged in artisanal mining where there are village exploitation quotas. The sanitary conditions there are deplorable. There is a great deal of polio, for instance, despite high income levels in general. So we have a problem within a cultural context with importance for analysis of any participatory approach that seeks to redistribute revenues. These are prestige-based societies, where rising incomes may well be invested in marriage prices and displays of wealth or generosity that seem ephemeral to us. But our ideas of wise investment and wealth management simply aren't the same as theirs.

These are prestige-based societies, where rising incomes may well be invested in marriage prices and displays of wealth or generosity that seem ephemeral to us. But our ideas of wise investment and wealth management simply aren't the same as theirs.

Richard Estes, SSC and WCU: This reminds me of a situation in Angola I knew of back in the 1970s in Portuguese Africa, where diamond cartels were active in national parks of only a few hundred square kilometers. They were creating pits everywhere. I'm shocked that even when you have organized cartels like DeBeers we can't seem to shame these people into avoiding protected areas. We are dealing with some of the most developed, yet also the most greedy societies in the world, and yet we can't seem to get them to respect some simple limits.

Anna Roosevelt, University of Illinois Field Museum of Natural History: This discussion has focused mainly on people and on political economies, so it is wonderful to hear that solutions lie in both social and biological processes.

Roger Fotso, WCS, Cameroon: We have been submerged by the social science perspectives. Certainly the two are equally important with regard to biodiversity; I don't see any inconvenience to discussing both together. On the contrary, it is productive.

Joseph Mewondo Mengang, Cameroon Ministry of Environment and Forestry: It was a biologist's survey of the Lobéké area in 1987 that created the first classification of it as a potential priority by the Ministry of Tourism in Cameroon.

Zéphirin Mogba, University of Bangui: For a biologist, perhaps the zoning and border questions would really depend upon the kinds of species that are found in different spatial areas, and in what quantities. But if we are serious about such natural resources becoming economic capital to be collectively managed, then research results must be better disseminated on several basic levels among communities in all three countries. Otherwise there will be no base, and when expatriates are constrained in their activities (as often happens with political instability in our region) the whole framework for new ideas and practices regarding wildlife won't suffer. Bases must be built, even by biologists.

Simeon Tchatoua Numbem, Cornell University: What is the place of agriculture in all this? How is agriculture changing in response to markets? How are "non-timber forest products" and soil quality informing or changing markets? How are we addressing these fundamental questions about agriculture?

Edmond Dounias, IRD / Montpellier: In all of our discussions of forest ecosystems we've been focusing on terrestrial ecosystems, and the use of aquatic regions has been under-addressed. The Sangha River as a river ecosystem has not been as heavily considered. When we see the region on Primetime or CNN we seem more interested in the trumpeting of the elephant or call of the duiker and not so much in the flapping of the fish's gills.

Michelle Kisliuk, University of Virginia: Back to perceptions of wealth, as redefined with regard to natural resources as a kind of capital to be preserved: I wonder if that brings us back to shifting perceptions of what wealth *is* across these different cultural systems. How can we come up with definitions of wealth that take into account these multiple visions?

Serge Bahuchet, LACITO/CNRS, France: Our teams of researchers have struggled with the issue of wealth over the years. One thing that leaps out when you study what people eat in CAR and Cameroon (and here I'm talking about forest residents with relatively little exposure to industrial economies, but who do have monetarized

economies) is that money serves to procure manufactured goods (petrol, soap, beer) but not food. Food economies are still more self-contained.

Michelle Kisliuk, University of Virginia: In some ways the most telling anecdotes of this session have been about cultural relations. But how do we have access to cultural systems that contain meanings about these central categories? Particularly if those meanings are manufactured and negotiated through the acts of song, dance, storytelling and other practices not so easily apprehended by outsiders?

David Watts, Yale University: I'd like to get more to the root of our attribution of value. Why are we talking so much about diamonds and ivory? What are the forces behind those realities of value?

David Wilkie, Associates for Forest Research and Development: We must be very realistic about value. Africa Resources Trust did a survey of African states' expenditures on protected areas per year, and found a real range there. Netherlands spends about US $3,500 per year per hectare, the United States spends about US $1,000, Kenya and Tanzania spend the most of any countries in Africa, which is around US $200, and every other country is around US $10-15.

SERGE BAHUCHET is a researcher at the Laboratoire d'Analyses des Civilisations à Tradition Orale in Paris. He has spent decades studying the culture and ecology of the BaAka pygmies in the Central African Republic. Since 1995 he has served as the scientific director of a 5-year research project of the European Commission called Avenir des Peuples des Forêts Tropicales (APFT). His research interests include: ethnoecological, ethnolinguistic and historical approaches to human integration into the African forest ecosystem; studies of the interrelationship between Pygmy hunter-gatherers and farmers; problems of modernism, conservation and sustainable development in Central African rainforests.

Selected bibliography:

1981- present. *Encyclopédie des Pygmées Aka: techniques, langage et société des chasseurs-cueilleurs de la forêt Centrafricaine*. 17 volumes. Paris: Société d'Études Linguistiques et Anthropologiques de France.

1988. Food supply uncertainty among the Aka Pygmies (Lobaye, C.A.R.). In *Coping with uncertainty in food supply*. de Garine and Harrison, eds. Oxford: Oxford University Press.

1991. Wild yams revisited: is independence from agriculture possible for rainforest hunter-gatherers? *Human Ecology* vol. 19, no. 2: 213-243 (with McKey and de Garine).

1997. Un style de vie en voie de mutation: considérations sur les peuples des forêts denses humides. In V. D. Joiris, ed., *Les peuples des forêts tropicales: systèmes traditionnels et développement rural*. Bruxelles: Civilisations, vol. 64, nos. 1-2: 16-31.

Serge Bahuchet, LACITO / CNRS, 44 Rue l'Admiral, Mouchez 75014, Paris, France, Tel: 1.45.89.76.55, Fax: 45.80.59.83, E-mail: bahuchet@mnhn.fr

DIANE DORAN is an assistant professor in the Department of Anthropology at the State University of New York at Stony Brook. Her research interests focus on the behavioral ecology of African apes. She has studied bonobos in the Democratic Republic of Congo (former Zaire), chimpanzees in the Ivory coast, mountain gorillas in Rwanda, and most recently, has established a research center in the Dzangha-Ndoki National Park in the Central African Republic for the study of sympatric western lowland gorillas and chimpanzees.

Selected bibliography:

1993. Sex differences in adult chimpanzee positional behavior: the influence of body size on locomotion and posture. in *American Journal of Physical Anthropology*. vol. 91, no. 1: 99.
1994. with K. D. Hunt. The comparative locomotor behavior of chimpanzees and bonobos: species and habital differences. In *Chimpanzee cultures*, R. W. Wrangam, W. C. McGrew, FBM de Waal, P.G. Heltne, eds. Cambridge: Harvard University Press.
1996. Comparative positional behavior of the African apes. In *Great ape societies*, W. C. McGrew, L. F. Marchant, T. Nishida, eds. Cambridge: Cambridge University Press.
1997. Ontogeny of locomotion in mountain gorillas and chimpanzees *Journal of Human Evolution*. vol. 32, no. 4: 323.

Diane Doran, N553 Social and Behavioral Sciences, SUNY at Stony Brook, Stony Brook NY 11794-4364, Tel: 516.632.9445, Fax: 516.632.9165, E-mail: ddoran@epo.som.sunysb.edu

EDMOND DOUNIAS holds a Ph.D. in agroecology from the Tropical Botanics Laboratory at Montpellier University, France. His academic specialization blends agroecology and anthropology, areas in which he pursues fieldwork in Cameroon, examining agriculture, environmental management and ethnosciences. He is currently the director of research at IRD, a position he has held since 1994.

Selected bibliography:

1993. Food consumption in the forest populations of the southern coastal area of Cameroon. In *Food and nutrition in the tropical forest: biocultural interactions and applications to development*, C. M. Hladik, H. Pagezy, O. F. Linares, A. Hladik, A. Semple, M. Hadley, eds. Paris: Unesco-Parthenon, Man and the Biosphere Series, 12: 295-310.
1996. Recrés forestiérs post-agricoles: perceptions et usages chez les Mvae du sud Cameroun forestiér. *Journal d'Agriculture Traditionnelle et de Botanique Appliquée*. vol. 38, no.1.
1996. Sauvage ou cultivé? La paraculture des ignames sauvages par les Pygmées Baka du Cameroun. In *L'alimentation en forêt tropicale: interactions bioculturelles et applications au développement*, C. M. Hladik, H. Pagezy, O. F. Linares, A. Froment, eds. Paris: Unesco.

Edmond Dounias, IRD-Montpellier. 85 Rue de la Planche 455590, St. Cyr en Val, France. Tel.: 33(0)2.38.63.31.71

SARAH ELKAN is a doctoral student at the University of Minnesota, where she studies geomorphology and soil science. She conducts field work in association with the Nouabalé-Ndoki National Park in Congo.

Sarah Elkan, WCS, Nouabalé-Ndoki National Park, c/o 185th Street and Southern Boulevard, Bronx, NY 10460, Tel.: 718.220.7159. E-mail: 102477.3350@compuserve.com

ERIC WORBY is Assistant Professor of Anthropology at Yale University. His research is concerned with the social implications of rural development and conservation initiatives for local communities in Southern Africa and South Asia. He has studied livestock development policy in Botswana, cotton-based development strategies in northwestern Zimbabwe, and low-input aquaculture projects for the rural poor in Bangladesh.

Selected bibliography:

1988. Livestock policy and development ideology in Botswana in *Power and poverty: development and development projects in the Third World*. D. Attwood, T. Bruneau, and J. Galaty, eds. Colorado: Westview Press.

1993. with Z. Samina. Nagashini Beel: a case study in the transformation of a common property aquatic resource. *Naga: The ICLARM Quarterly*.

1994. Maps, names, and ethnic games: the epistemology and iconography of colonial power in northwestern Zimbabwe, *Journal of Southern African Studies* 23: 371-392.

Eric Worby, Department of Anthropology, Yale University, 51 Hillhouse Avenue, New Haven, CT 06520.
Tel: 203.432.3700, Fax: 203.432.3669, E-mail: eric.worby@yale.edu