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COMMENTARY

Conserving What and for Whom? Why Conservation Should Help Meet Basic Human Needs in the Tropics

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ABSTRACT

For hundreds of millions of people, biodiversity is about eating, staying healthy, and finding shelter. Meeting these people's basic needs should receive greater priority in the conservation agenda. Wild and semi-wild plants and animals contribute significantly to nutrition, health care, income, and culture in developing countries, and the poorest and most vulnerable people often rely on those resources most. Depleting those resources or making them inaccessible can impoverish these people even further. 'Pro-poor conservation'—that is, conservation that aims to support poor people—explicitly seeks to address basic human needs. Such an emphasis has many potential synergies with more conventional conservation goals. Nonetheless, pro-poor conservation requires a distinct attitude to gauging conservation outcomes and a different approach to conservation science. Biologists can make a vital contribution.

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Key words: community management; democratic-conservation; development; hunting; modified habitat; multiple use; poverty; protected areas; subsistence; utilization.

CONSERVATION POSES TOUGH CHOICES. We cannot prevent every species from going extinct or from losing genetic diversity, so we must prioritize what to save. Those priorities should also take into account human health, wellbeing, and culture. We argue that conservation activities designed to meet people's basic needs deserve more attention. This, to some extent, implies a different *kind* of conservation and conservation science: one that has subsistence needs at its core.

CURRENT CONSERVATION PRIORITIES

Conservation NGOs have played a major role in setting the priorities that drive the global conservation agenda (Redford *et al.* 2003, Brooks *et al.* 2006). These priorities emphasize protecting species and ecosystems—not the needs of local people—in part because saving charismatic animals and plants from extinction appeals to those on whom conservation agencies traditionally rely for financial support. It is true that conservation agencies have devoted some attention to generating income for poor people through ecotourism and the sale of natural products. For example, thanks in part to their efforts, the Serengeti tourism industry now employs about 50,000 Tanzanians and benefits at least another 50,000 people in the park buffer zone (Wolanski 2004); various similar efforts are underway elsewhere. The emphasis and motivation however remains the conservation of charismatic species.

In contrast, much less is being done to maintain wild and semi-wild species and habitats specifically to fulfill human needs. Despite persuasive technical arguments, NGOs and governments make relatively little effort to protect the wild relatives of crops, potential sources of new pharmaceuticals, genetic diversity in commercially important plants other than crops, or organisms that recycle nutrients or pollinate crops (International Plant Genetic Resources Institute 2004, Meilleur & Hodgkin 2004). Even fewer resources go into ensuring that disadvantaged people retain access to species on which they have traditionally relied on for food, livelihoods, shelter, and medicines.

POOR PEOPLE'S BIODIVERSITY

For several billion people, wild plants and animals are not just objects of admiration, but the essential elements of daily life. While most of these people grow crops and raise animals, they still depend to a surprising degree on wild resources obtained through hunting, gathering, and fishing.

Ethnographic studies typically find these people use hundreds of species for a wide range of purposes. Wild meat, fish, and insects provide much of their protein, while forest fruits and vegetables are a source of vitamins (Scoones *et al.* 1992). In fact, in 62 developing countries, wild meat and fish provide more than 20 percent of all protein (Bennett & Robinson 2000). Studies show it is also common for 'wild' plants and animals to provide 20–30 percent of rural peoples' income in developing countries (Vedeld *et al.* 2004).

Many of the estimated two billion people that lack adequate access to Western medicine rely largely on wild and semi-wild plants and animals for much of their treatment (Farnsworth & Soejarto 1991, WHO 2002). Moreover, families facing individual or social hardships, such as poverty, sickness, droughts, wars, and economic crisis, are most dependent on 'wild resources' (World Resources Institute 2005). If these species become scarcer or disappear, these people's already difficult lives will be made even harder.

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That is precisely what is happening in many places: plants and animals on which poor people depend upon are disappearing. An estimated 4160 to 10,000 medicinal plants are endangered by habitat loss or overexploitation (Hamilton 2004), and many more have become hard to find in places where rural families traditionally collected them. In many regions, overexploitation of fish and game along with forest destruction and water pollution have depleted the supply of fish and wild meat, and local people have lost a valuable source of nutrition. In many places, fuel-wood has become scarcer (Arnold *et al.* 2006). Species of cultural and symbolic significance have also been lost.

Sometimes people find substitutes. They may cultivate or purchase alternatives, or come to depend on charitable assistance. But substitutes are not always available and people suffer. It is well established that environmental degradation impacts heavily on the poor causing greater poverty (Millennium Ecosystem Assessment 2005). This often leads to migration from rural to urban areas, forest frontiers, or marginal lands. Desperation forces people to adopt unsustainable short-term survival tactics—leading to further environmental damage and a cycle of decline (Millennium Ecosystem Assessment 2005, World Resources Institute 2005).

A PRO-POOR APPROACH TO CONSERVING BIODIVERSITY

So, what specifically might pro-poor conservation actually require? In our view, the basic principles are finding, developing, maintaining, and safeguarding managed landscapes that include adequate areas to serve as sources of fauna and flora for local people, especially those who are vulnerable and marginalized.

Conservation programs that address basic human needs will often invest in different places and ways than those focused on saving species from extinction. The emphasis needs to be on places where many people rely on declining wild resources with few substitutes. These areas may often be drier, more heavily disturbed, and more densely populated than the species-centric hotspots identified by the large conservation agencies (Brooks *et al.* 2006). For instance, they are likely to be in Sub-Saharan Africa and the upland areas of Asia and the Pacific.

A pro-poor approach also implies investing resources outside large, strictly protected areas. Biodiversity must be accessible and people must have some rights to use it. For example, instead of buffer zones serving primarily to protect core areas in parks, protected areas can be established and justified by their ability to help sustain tangible local benefits, such as breeding grounds for animals and sources of pollinators, seeds, clean water, or valued products, within a larger landscape. Smaller strategically located reserves might incur lower opportunity costs for the poor, and might meet their conservation needs better than fewer large areas (Zuidema *et al.* 1996). Greater emphasis would be placed on conservation in multiple-use 'protected areas' including IUCN categories IV ('Habitat/Species Management Area: Protected Area managed mainly for conservation through management intervention') and VI ('Managed Resource Protected Areas: Protected Area managed mainly for the sustainable use of natural ecosystems'). These now account for nearly half the land in officially designated and categorized protected areas globally (Chape *et al.* 2003).

Some of the best examples of the effectiveness of such conservation approaches come from the Pacific Islands, where traditional no-fishing zones helped to maintain fish stocks and other marine resources (Johannes 1978, Cinner *et al.* 2005). These approaches are increasingly being replicated in marine areas elsewhere (Johannes 2002, United Nations Food and Agriculture Organization 2002, Gell & Roberts 2003). Though initially built on folk ecology, the approaches are becoming more science-led (Lubchenco *et al.* 2003, Pikitch *et al.* 2004), with researchers now claiming to satisfy both fishermen and conservationists (Meester *et al.* 2004).

Changing the practices of both local people and external actors in ways that help maintain the plants and animals that local people use will often be essential. This implies working with communities to design and enforce rules about hunting, fishing, and gathering plant material, limiting outsiders' access to local resources and giving poor people greater control over them, and protecting the places where animals breed, and obtain food, and salt. It means promoting corridors, agroforestry, fire management, and reduced-impact logging (Schroth *et al.* 2004). It may also require domestication or more intensive management of traditionally wild plants and animals.

Needless to say, a pro-poor approach to conservation inevitably implies working closely with communities rather than fencing them out. It goes beyond most (though by no means all) previous 'community,' 'participatory,' or 'development' efforts intended primarily to win local acceptance of other people's conservation agendas. It involves focusing on the weak and vulnerable, not only the politically perceptive and influential.

While conservation actions developed wholly without local engagement might occasionally benefit the poor, pro-poor conservation will generally require local engagement to help to determine an agenda that meets their concerns.

Biodiversity assessments that privilege the viewpoints of those directly dependent on wild resources will differ from global perspectives (Table 1). Differences reflect distinct perceptions and motivations; they need not imply discordant judgments of desirable versus undesirable conservation outcomes. One fundamental advantage of working with local, in contrast to external, viewpoints, is that local priorities directly engage local understandings and interests. An apparent disadvantage is that these local goals do not attract the same external support as many international perspectives can muster.

SYNERGY WITH CONVENTIONAL CONSERVATION

A pro-poor approach offers prospects of finding new opportunities for conservation, to attract new supporters and to access new resources. A pro-poor approach alone cannot conserve everything. Some species require large areas of intact habitat and may not survive in fragmented or modified ecosystems, and some do not co-exist readily with people (Redford & Richter 1999). In some cases it may be necessary to compensate poor people for strict protection, so they can meet their needs from other sources. All the same, protected

TABLE 1. *Contrasting global and local perspectives on biodiversity. Based on ideas presented in Vermeulen and Koziell (2002) and Wiersum (2003).*

	Dominant global perspectives adopted by most conservation authorities	**Dominant perspectives of local communities**
Major biodiversity value	Rare and endemic species and species belonging to charismatic taxa	Species used for livelihood and cultural purposes. Some species may be considered undesirable (pests or dangerous species)
Main rationale for conservation	Maintain ecological integrity on basis of scientific criteria	Maintain products and cultural values based on local criteria
Major objective for maintaining biodiversity	Preserving option and bequest values for future generations	Maintaining present use and guaranteeing future supplies
Species considered	All taxonomically reasonably known species	Species locally recognized to provide valuable products and services, including cultural uses, and the species those species depend on.
Main conservation approach	*In situ* preservation by prohibiting/or limiting	Controlled sustainable use and gradual domestication
Clients/user groups	A continuum from unclear to 'global' or 'future generations'	Clearly defined
Wild and domesticated species	Treated differently	Form a continuum

areas will never make up more than a fraction of the planet's surface. The future of many, if not most, species depends on what happens outside strictly protected areas and wilderness areas.

Despite common prejudices, human impacts in the tropics are not always wholly detrimental, and many land-use alternatives have biodiversity benefits as well as costs. Conservationists have often viewed modified habitats as a 'glass part empty' rather than a 'glass part full.' This bias reduces the recognition of opportunities. Many species can and do flourish in nonpristine environments (Robbins *et al.* 2006). Bwindi Forest in Uganda (now a National Park) contains half the world's mountain gorillas (*Gorilla beringei beringei*) despite once being a productive timber forest (McNeilage *et al.* 2001). These gorillas like to feed where thick herbaceous growth follows disturbance and so they may have benefited from logging. Logged-over forests in Borneo maintain significant wildlife conservation values that can be further improved by appropriate management (Meijaard & Sheil in press). While no one is arguing that oil palm (*Elaeis guineensis*) estates are 'good for conservation,' those in Sumatra have some value as habitat for tigers (*Panthera tigris sumatrae*) and other endangered species (Maddox *et al.* 2005). From the community forests in Mexico (Johnson & Nelson 2004) to the tree-dominated agroforestry systems in Sumatra (Thiollay 1995, Garcia-Fernandez *et al.* 2003, Beukema & van Noordwijk 2004), studies continue to highlight the diverse biodiversity present in multifunctional landscapes that poor people also depend upon.

Multiple-use landscapes have various conservation values. These values will often be affected by management choices. Trade-offs are inevitable, but land-use mosaics with a mix of different use and conservation intensities could be central to effective conservation strategies, whether to protect globally endangered charismatic species or species relied upon by rural people.

Some opportunities for synergy may not be immediately apparent, but they are important nonetheless. Thus, for example, in East Kalimantan, Indonesia, current regulations require loggers to clear away the undergrowth after timber has been removed. This has a negative impact on both plant species that local people often use, such as medicinals, rattan, and wild vegetables, as well as various types of wildlife, and it has little silvicultural value. Moreover, the rules prescribe clearing in a blanket fashion, and it is practiced even in areas left unlogged due to rugged terrain. Local people helped researchers understand how this treatment harms both local needs and the forest. Research suggests that any silvicultural benefits are indeed outweighed by the costs; and the practice should be halted (Sheil *et al.* 2006). Such examples show that incorporating local concerns into management and planning while good for people can also benefit conservation.

In traditional conservation projects, conflicts with local people are often due to the manner in which conservation projects are implemented. Hasty interventions that fail to build local trust are perceived by local people as just one more attempt to gain control over valued land and resources. On the other hand, working with local people to identify local needs can build trust. By building a basis for mutual understanding, oversights and misunderstandings can be avoided. Nearly everyone accepts the need for some form of conservation and most cultures have their own conservation ethic. In many cases, local and external goals have much in common (*e.g.*, Sheil & Boissiere 2006).

National governments in the tropics may be more willing to support interventions tailored to meet local needs (but see Sekhsaria, this issue). Indeed conservation with democratic support is likely to be more acceptable and thus often more effective than conservation that is imposed (Schwartzman *et al.* 2000).

Resting our hopes on finding local and national support is not simply wishful thinking. The growth of environmentally concerned movements throughout the developing world is among the most profound political developments of recent decades. Public opinion polls in poor tropical countries consistently show a concern about the environment that is similar to the levels found in wealthier industrialized countries (Steinberg 2005). Thousands of citizen groups in developing countries are increasingly campaigning in favor of various environmental causes (Steinberg 2005), while discussions with people living in biodiverse tropical regions reveal a widespread desire for effective, but democratically accountable,

conservation (Padmanaba & Sheil in press). Such support will benefit conservation more generally, but it is especially likely to favor, and to arise from, activities that bring local benefits.

LEARNING LESSONS

Conservation by using rather than locking up biodiversity has had a bumpy history. This enticing vision gained widespread credibility with the publication of 'Caring for the Earth' (IUCN *et al.* 1991) and the discussions at the 1992 Earth Summit in Rio de Janeiro, and led to the first generation of official Integrated Conservation and Development Projects (ICDPs). For a time, almost every new conservation project seemed to support development goals: Local people would be allowed to hunt in the Serengeti and the forests of the Amazon basin would become a mosaic of self-supporting extractive reserves. But naïve enthusiasm outstripped abilities, and these early ICDPs often failed to provide the anticipated benefits, both in terms of conservation and development. These disappointments generated a backlash, leading various commentators to suggest such efforts are inherently doomed (reviewed in Wilshusen *et al.* 2002).

ICDPs were not wholly failures (see Schwartzman *et al.* 2000, Hughes & Flintan 2001). Those that fell short did so for reasons that are now understood (Hughes & Flintan 2001, Brown 2002, Wilshusen *et al.* 2002, Wells & McShane 2004, Spiteri & Nepal 2006, Brooks *et al.* 2006). One lesson was that these projects remained essentially protectionist, seeking to sever rather than maintain local access to natural resources. The projects were designed and imposed by outsiders to meet predefined goals, with little local control. The development components compensated local peoples' losses to some degree, but the benefits and degrees of engagement were generally insufficient to counter local resentment and opposition, and often accrued inequitably adding to perceived injustice. Besides, the key threats were often external, and the projects had few tools with which to address these. Many of the forces that undermined ICDPs also pose serious challenges to traditional protectionist (guards and fences) conservation approaches (Wilshusen *et al.* 2002).

So how do we improve projects to benefit the poor? Two requirements that emerge clearly are the need for varied approaches (a 'pro-poor approach' is certainly no panacea to every conservation challenge) (Robinson 1993, Medellin 1999) and the need to better engage people (Brown 2002, Wells & McShane 2004, Brooks *et al.* 2006). Even when conservation is the primary goal, greater efforts are needed to ensure compensation and incentives are better targeted, and address those with few livelihood alternatives (Spiteri & Nepal 2006). Such targeting becomes doubly vital in a pro-poor approach.

Efforts to clarify what works in complex environmental projects repeatedly underline the need to avoid inflexible systems, and instead develop management strategies that learn and respond (Sayer & Campbell 2003). Though scattered, the sum-total of past experience working on poverty, conservation, and environmental management begins to provide a good foundation for what might work (Hughes & Flintan 2001, Brown 2002, Fisher *et al.* 2005).

WHAT DOES PRO-POOR CONSERVATION LOOK LIKE?

Effective pro-poor conservation projects may not look much like conservation projects at all. Sometimes, the main threats that must be addressed are external. For example, in many tropical countries, governments have claimed natural forests as state land, and have allowed these to be exploited and converted with little reference to their inhabitants (Sekhsaria 2007). Innovative approaches to recognize and defend such regions and their values against external threats will often be crucial to a pro-poor conservation approach.

When the major threats include local actors, the challenge will be more complex. Excessive exploitation often results from a 'free for all' or a 'tragedy of the commons' situation, in which local people may become their own enemies. Restraint is desirable, and may even be acceptable as long as the rules are fair. Communities have often developed sophisticated traditions and practices to safeguard their access to vulnerable resources, and while these systems may not always be robust to the challenges of the 21st century, they can provide a foundation (Ostrom *et al.* 1999). Besides the embodied technical understanding, rules based on traditional approaches are often more likely to be understood and respected locally (Johannes 1978). Acceptance of new rules is not impossible. One example is the crocodile hunters of Mamberamo, Papua (Irian Jaya, Indonesia), who have, despite initial opposition, accepted externally suggested size-based rules on trading in skins, condemn those who breach these rules, and chase away poachers (D. Sheil, pers. obs.). A pro-poor approach will often require the development of such local rules and the means to enforce them.

Elements of pro-poor conservation activities can be drawn from successful community-based resource management projects, where key players agree to develop, implement, and periodically review procedures, assess needs, and gauge effectiveness. Promising examples may be drawn from many regions and biomes from marine fisheries to arid lands (Schwartzman *et al.* 2000, Campbell & Shackleton 2001, Johannes 2002). Community-based forest landscape restoration in Nepal has seen reforested hills boosting wildlife diversity and productivity (Pokharel *et al.* 2006). Success reflects participation by local actors, the development of suitable local institutions, and the technical and financial support to initiate and nurture the process (Pokharel *et al.* 2006). Such projects can also focus on wildlife. For example, effective game ranching projects have been developed by and for communities (Le Bel *et al.* 2004).

In short, for pro-poor conservation, the needs of the poor and the threats to these needs must be better recognized, understood, and addressed. Beyond that, a plurality of alternatives and options seems possible. The best options will depend on local needs and circumstances. We still have a lot to learn, but we know enough to make a start.

SUPPORT: PARTNERSHIPS AND RESEARCH

What role can researchers, conservationists, development professionals, funding agencies, and other external groups play? All

the elements of 'pro-poor conservation' mentioned already might benefit from external support. All conservation initiatives can benefit from long-term defenders and champions. Funds, guidance, awareness raising, and capacity building will also be necessary. Two specific aspects, partnerships and research, could greatly facilitate the process and warrant a special consideration.

In an ideal democratic world, conservation might always be conceived as a partnership of conservation organizations with local people. Partnerships require shared decision making, shared risks, and a balance of rights and responsibilities between external agencies and local groups. In the real world, this can be difficult and time consuming. It is hard to reach the poor and marginalized. Nonetheless, partnerships offer outcomes that are often more ethical and more practicable than most alternatives. Partnering can also help build local institutions and develop people's sense of their own worth and that of their environment (van Rijsoort & Zhang 2005, Vermeulen & Sheil in press).

Pro-poor conservation will benefit from research. Promising initiatives may, as in the case of the traditional Pacific fisheries, be discovered rather than created (Seymour 1994, Johannes 2002). The social and political institutions needed to effectively regulate resources must also be characterized and developed to ensure that adequate numbers of affected people find the benefits of involvement outweigh the costs (Dietz *et al.* 2003). As with any conservation investments experiences should be reviewed, shared, and learnt from (Kleiman *et al.* 2000, Ferraro & Pattanayak 2006).

Working with local people requires effective communication. This is far from trivial (Sheil & Lawrence 2004). To define the scope and goals of an intervention requires a sound basis of understanding of local needs, preferences, and value systems. Assessments to support pro-poor conservation will focus on which species local people use or value, their location, where they can be accessed, their threats, and which management approaches are required to maintain them. It can also seek synergies with more conventional conservation goals. Both communications and assessment can benefit from diagnostic research that sets out to develop the required understanding between locals and outsiders (Sheil *et al.* 2006).

Research to support pro-poor conservation must draw upon a broad range of disciplines. Biological sciences will remain crucial to guide the conservation and sustainable utilization of wild and managed populations. Whether equally successful approaches to those of marine reserves in maintaining fisheries can be developed for terrestrial systems remains uncertain, and urgently needs attention (*e.g.*, Novaro *et al.* 2000). Integration across disciplines is also needed. For example valuable work on the sustainability of subsistence hunting (*e.g.*, Robinson & Bennett 2004, Sirén *et al.* 2004) is especially helpful when biology, incentives, and controls are combined to show which species are vulnerable and where, and which cause no concern (*e.g.*, Cowlishaw *et al.* 2005).

Research can and should allow us to better predict and forestall crises. In a 'pro-poor conservation' guise this implies a stronger recognition of the often vital role of local biodiversity in alleviating human suffering during drought, famine, and other humanitarian crisis.

WILL PRO-POOR CONSERVATION WORK?

What are the chances of success? Since few resources have been devoted to pro-poor conservation, we still know relatively little about the best practices. It also remains to be seen whether investing in pro-poor conservation can lead to better outcomes, for people or conservation, than other programs.

The task seems easiest when global and local conservation agendas overlap or create synergies (Kremen *et al.* 2000). Where that happens, supporting local priorities can greatly strengthen these agendas' effectiveness. Such 'win–win' solutions are also possible if local people are compensated for helping to achieve global conservation objectives (Wunder 2005). However, in other cases divergent objectives may imply incompatible policies and practices. Better recognizing these trade-offs will improve the search for solutions and compromises.

Some conservationists feel that time is too short to negotiate every intervention. While they doubtless regret the hardships local people experience, their main concern is to save species. But even these conservationists may benefit from building closer links with local people. As poor people are frequently identified as part of conservation problems, working with them must often be integral to the solution. Building these links takes time and has no guarantees. There can be various stumbling blocks, both conceptual and practical. Yet building such links is not necessarily as hard as it sounds, though it does require a willingness to try (Sheil & Lawrence 2004).

Skeptics will probably point out the expense involved in ensuring that rural families retain access to wild and semidomesticated plants and animals, and harvest these sustainably—much less achieve the institutional presence required on the ground to work with large numbers of geographically dispersed households. Given the relatively low market value of the products and services, the investment might not be worth it, at least in a narrow financial sense.

One important argument in favor of a pro-poor approach, and one that should interest development agencies committed to addressing poverty, is that the poorest families and indigenous peoples are likely to benefit the most, as they depend most heavily on wild resources. One cannot say the same for many other development activities.

FINAL WORDS

Conventional conservation choices often emphasize Western preferences including perhaps increasing distaste for harvesting wild species. But the world's poor can seldom afford such misgivings and conservationists need to be pragmatic. Protecting nature where it is being exploited maintains future options.

We have come a long way since the 1992 Earth Summit in Rio de Janeiro offered a vision of sustainable development in which conservation benefited the poor and assisting the poor would benefit the environment. Yet, as the authors of both the recent Millennium Ecosystem Assessment and the Millennium Development Goals underline, a disaggregated approach to conservation and development

serves the interests of neither (Sachs & Reid 2006). If conservation organizations cannot offer real benefits to local people or gain popular approval, retaining public funding or political support from governments in the tropics will prove increasingly difficult. Conservationists will focus on strictly protected areas and abandon biodiversity elsewhere. For their part, development agencies will have a hard time helping poor rural families find substitutes for all the lost natural foods, medicines, fuels, housing materials, soil nutrients, fodder, clean water, and other products and services. Simply letting these natural safety nets disappear could condemn many people to even greater poverty, and undermine many of the development agencies' broader agendas.

We are not suggesting that species that do not benefit poor people should be allowed to disappear forever. But we are suggesting that conservation can and should address broader, more diversified, and more democratically defined goals, and should recognize and address the needs and aspirations of local people: especially the poor and vulnerable. Such efforts might allow people to live happier and more productive lives, and could also strengthen local support for conserving species for their own sake.

Some questions remain controversial whichever approach is adopted. What are acceptable changes in ecosystems? Where do we draw the line between human welfare and conservation? Do we let people cultivate in national parks when they run out of other land? Different people will wish to draw the line in different places, and lines are needed. But there are good ethical and practical reasons why conservationists should not assume poverty is someone else's problem. And as long as people depend heavily on wild and semidomesticated species, we should try to ensure that those species remain available.

For hundreds of millions of people, biodiversity is about eating, staying healthy, and finding shelter. Such needs, in addition to those of the tiger and other endangered species, must also be considered a conservation priority. Clearly it is not a question of 'either/or,' but rather of finding a better balance.

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