

INCENTIVE-COMPATIBLE INSTITUTIONAL DESIGN: WHO'S IN CHARGE HERE?¹

Daniel W. Bromley
Anderson-Bascom Professor of Applied Economics
University of Wisconsin-Madison

I. The Problem

Incentive compatible institutional arrangements are those in which all participants in a particular game defined by those institutions know they will maximize their well being if and only if they respond honestly to any information request inherent in—implied by—the game. For the design of programs to reward individuals for the provision of ecosystem services, incentive compatibility requires that the game form be one that each participant will honestly reveal to the creator of the institutional arrangements—think of this as an “auctioneer”—the exact minimum necessary to alter that individual’s behavior so that it (the individual behavior) aligns perfectly with the purposes of the program. The auctioneer obtains exactly what she seeks, she pays the absolute minimum necessary to bring about the desired behavioral change, and she knows that she can trust the individual whose behavior she seeks to modify. If any of you have fallen into the perverse habit of paying your children to bring home better grades you are imprisoned by incentive-compatibility problems. How do you know exactly how much you need to pay to produce A’s rather than B’s or C’s—or D’s? Perhaps your children will produce better grades at a lower price than what is on offer? And notice the unpleasant nature of a process in which you and your child sit down to negotiate, indeed to renegotiate, the exact—the optimal—price.

¹ Keynote address for a conference “Designing Pro-Poor Rewards for Ecosystem Services” sponsored by the Land Tenure Center, University of Wisconsin, Madison, April 7, 2008.

My subtitle asks the equally pertinent question: Who's in charge here? This is pertinent because any program to induce others to alter their behavior is a realm of unequal power—a superior and an inferior. Familiar terms that describe these games include parent-child, boss-worker, and donor-recipient. In economics the first person in these dualities is called the principal and the second person is called the agent. We call these principal-agent games. The challenge in such games is to get the agent to do what the principal wants, and to make sure that the agent is induced to be honest in her revelations about what she is doing—and what she promises to do when you are not there to observe her behavior. And, as above, the challenge is for the principal to pay no more than is absolutely necessary in order to induce the agent to behave as desired.

Notice that programs in which those from outside of a particular community offer financial inducements to alter the habituated behavior of those inside that community represent a game of unequal power and of unequal economic opportunity (which is the same thing). We from the outside are able to take our offer to a large number of potential recipients, but those out on the ground often must accept our offer, or receive nothing at all. And of course the poorer they are, the more eager they will be to accept our offer. As we say, the poor can be induced to sell out cheaply. They are known to have a low reservation price. I also used a term above that warrants brief elaboration. I alluded to their habituated behavior. I used this term to alert you to something that is too often overlooked. The presumption when outsiders look in on a community is to imagine that each day—perhaps each hour—the behavior on display is the result of constant calculation of gains and losses across a wide number of margins. This presumption would be seriously misleading. Human behavior is deeply habituated on the basis of long experience with what seems to work. Only when confronted by startling doubt and surprise do

individuals stop and reassess what they are doing—and why they are doing it. If you doubt this, a moment’s introspection will reveal each of us to be seriously embedded in habituated behavior. This matter of deep habituation becomes relevant in the current context if we suppose that agents out on the ground can be effortlessly dislodged from a lifetime of habituated behavior with respect to their natural surroundings that are suddenly of such abiding interest to us from the outside, and quite taken for granted by those who are seriously embedded therein.

The above comments may seem surprising in a realm that is often characterized as “win-win”—that simplistic property in which both sides get what it is they think they want. Indeed, there is something about “pro-poor rewards for ecosystem services” that brings about a reassuring warm glow—it is rather like a double dividend. Gee, we can get what we want, and they can get what they want? All we want is different behavior on their part, and all they want is a little financial consideration. It is often the case that those who denounce tax breaks for industrial polluters to help them clean up their act are also the ones who can be quite enthusiastic supporters of paying the poor to do approximately the same thing. So the “pro-poor” dimension of many of these programs is central to their abiding logic—and thus to their appeal among the general population.

You may be excused the gathering impression that I have some qualms about such programs. I owe it to you to explain my reservations. And I wish to be very clear that I do so with the hope that it will help you to design better programs. It is probably too late to stop many of these initiatives, but let us make sure that as we persist along this policy trajectory we undertake those actions—those design features—that will help to make sure the programs succeed. I will discuss these design issues under the headings of feasibility and sustainability.

II. Feasibility

The Ecological Society of America reports that ecosystems provide “services” that:

- moderate weather extremes and their impacts
- disperse seeds
- mitigate drought and floods
- protect people from the sun’s harmful ultraviolet rays
- cycle and move nutrients
- protect stream and river channels and coastal shores from erosion
- detoxify and decompose wastes
- control agricultural pests
- maintain biodiversity
- generate and preserve soils and renew their fertility
- contribute to climate stability
- purify the air and water
- regulate disease carrying organisms
- pollinate crops and natural vegetation

It should be obvious that in the realm that most of us work, only 3-4 of these services present themselves as plausible—erosion control, biodiversity protection, soil husbandry, and perhaps a little pollution control. As we address the matter of feasibility we must understand that the key issue here is performance on the part of the agent for financial rewards on offer from the principal. It is too easy to assume that these are bargains freely entered into by consensual adults. We may even see reference to the magic of bargains familiar to those who like to cite Ronald Coase [1960]. We must understand that the scope for these happy Coasean bargains is threatened by the very thing that Coase left to one side—transaction costs. The first of these are the costs of gaining information about exactly what it will take in the way of payments to induce the performance we seek. This is the incentive compatibility problem I mentioned at the outset. A second cost is that of negotiating contracts. Finally, there is the problem of enforcing the contracts that have been struck. In a word, what conditions are necessary and sufficient to

trigger a breach of the contract by either party? How much biodiversity preservation is sought? How much has been provided? And by the way, what exactly is more rather than less biodiversity? At the extremes we know it—the dry sweeps of Rajasthan or of Darfur do not put us in mind of Rondonia. But the hard cases lie between those extremes. And I submit that they are very hard indeed.

Feasible programs require that the very greatest attention be paid to incentive design that acknowledges the environmental status quo against which progress is to be measured. Are individuals being rewarded for correcting that which they have previously harmed, or to preclude them doing similar—or different harms—in the future? I have referred to this as the problem of defining the reference level [Bromley, 2000]. What, exactly, is the ecological status quo against which change is to be judged?

Notice something important here. The Global Environment Facility has struggled with the severe conceptual and empirical problem of incremental costs and benefits. That is, the GEF wishes to induce those behaviors that would not be part of “normal” project and program design. But with social learning, and with associated behavioral change, it becomes increasingly difficult to identify truly incremental behavior. As concern for nature becomes more completely embedded in program and project design—we call it mainstreaming—the incremental portion will diminish. And that is good. It means that we will begin to realize better environmental behaviors and outcomes without the need to keep paying for those behaviors and outcomes.

But there is an alternative scenario—that is, our rewards for certain behaviors with respect to nature will surely alter what will become habituated behaviors. However, if the funds dry up for various rewards, we face the possibility that the desired behavior will revert to its former state. From the point of view of the agent, once the principal stops paying for particular

behaviors, those behaviors lose their aura of legitimacy. Perhaps, the agent might presume, we have decided those new behaviors are no longer important. If the new habituated behavior is no longer financially rewarding, do not be surprised if it changes.

III. Program Sustainability

Since all of us are interested in sustainability—in its various forms—I must say a few words about sustainability of the programs under consideration here. Specifically, I want to call attention to a continuum of policy instruments—institutional arrangements—that deserve to be considered. I call these policies: (1) facilitative policies; (2) inducing policies, and (3) injunctive policies. Each instrument choice holds different implications for the sustainability of these programs.

A. Facilitative Policies

Facilitative policies allow individuals to undertake behavioral changes that are consistent with the long-run interests of both the principal and the agent, but not in the short-run interest of the agent. There are a range of behavioral changes out on the ground that the agent might like to pursue, said changes being precisely coincident with changes that the principal wishes for, but particular barriers stand in the way of implementing those changes. Think of these as hurdle problems. I call them hurdle problems because a small amount of financial assistance now, of limited duration, could have lasting benefit to both the principal and the agent. Short-term liquidity problems might be rectified and from then on the agent would be perfectly willing and able to persist on a new behavioral trajectory.

Perhaps a few small check-dams would stabilize stream banks and allow for the harvesting of fresh water fishes to supplement local protein supplies. Other small investments might permit a trajectory of future behaviors that will have desired ecological attributes. The inducements do not always need to be in terms of cash. Perhaps limited opportunities for subsidized credit will do the trick.

Facilitative policies remind us that we must always initiate our analysis on the ground with a careful assessment of the livelihoods of those whose behavior we seek to alter. There are a large number of actions taken by local people that they know are not in their long-run interest, but they are locked into certain patterns of interaction by the inability to deal with the hurdle problem. We will often impute a psychological explanation—they are risk averse. This is a false diagnosis of the situation. If you cannot move you are not choosing to stand still. So do not tell me they are risk averse. Look hard and you will find the real reasons why they are doing what they are doing. Once that is understood, it is possible to think of facilitative policies that have good livelihood implications, and good environmental implications. Here is a double dividend worth pursuing.

B. Inducing Policies

By inducing policies I mean those institutional changes that will realign incentives for those settings and circumstances in which the long-run interests of the principal and the agent fail to converge. Note that unlike facilitative policies, where the long-run interests of the principal and the agent are coincidental, here one needs policies to address the divergence in the interests of the principal and the agent running into the future. There is no hurdle problem here because of a divergence in the desired long-run behavioral trajectory. Change cannot be

facilitated—it must be induced.

It is here that incentive sustainability becomes a serious challenge. We must be clear that financial inducements are not sufficient to alter long-run behavioral change. This is necessarily so because the economic and ecological circumstances of a group of people are always in the process of becoming. We cannot design incentive-compatible institutions into the future because neither we nor they know precisely what the future will bring. If you need a reminder of this, consider the practical implications for rural livelihoods of the dramatic changes in the price of grains being driven by the recent frenzy over bio-fuels. Land previously set aside in conservation reserves, in wildlife areas, and land devoted to forage crops is being converted into grains. And the erosion potential of land devoted to grains is assuredly higher than if that same land were to remain in its current uses. Inducing policies, if they are to give rise to sustainable ecological benefits, must constantly be updated and modified. Notice that this locks the principal and the agent in a continual game of re-negotiation. Those out on the ground, who are not immediately charmed at being treated as the agent of someone else, will not find this a compelling future. The more dynamic is the co-evolution of the economic and the natural systems in a particular location, the more difficult is the challenge of instrument design—and the more fragile is the on-going relationship between those who seek to alter behavior, and those who will soon come to see themselves as mere puppets in the increasingly vexing challenge of keeping them “on task.”

C. Injunctive Policies

By injunctive policies I mean those that require—mandate—a particular performance target on the part of individual economic agent. You will call these regulatory policies. In

contrast to the volitional component of facilitative and inducing policies, here we encounter compulsion.

While compulsion—restriction—works quite well in a mature and highly articulated nation-state, the history of compulsion in the developing world is problematic. After all, why should we expect regulations to work when so very little elsewhere in these economies works well? I resist the facile explanation that these are failed states. That judgment is inappropriate. They are weak states—and weak states do what they can do with the resources at their disposal. To call them “failed” is to assume that all of the requisite conditions are present but simply mis-applied—or not applied at all. In the condescending words of Mancur Olson, these countries need to “wise up [Olson, 1996].” The only pertinent way to think of this issue is that of weak states—those unable to take the necessary steps that will remedy resource degradation.

IV. A few Closing Observations

Programs such as those under discussion here bring together two distinct epistemic communities—each with its own creation story. On the one hand we have those who see the earth through the lens of a garden that, since the arrival of humans, has been on a downward trajectory. Nature is natural and the intrusion of humans into this marvelous realm is a variant of original sin. The policy challenge is to find ways to make sure that humans stop destroying what they inherited. The other creation story is that people were put here to multiply and take dominion over God’s commons. Along the way certain pieces of the natural world were singled out as quite extra-ordinary and so those who only wish to make a living are constantly confronted by demands to stop what they are doing. The first group finds nature more compelling than people, while the second group finds people more compelling than nature. It

would be wonderful indeed if this effort to link ecosystem services and rural livelihoods could bring these two communities closer together.

Before that can happen however, I feel obliged to point out a serious complicating issue. The complication I have in mind is that for the most part, the more plausible explanation for degraded natural habitats rests not with those who live in those places. To the extent that this is a plausible hypothesis, all of our best efforts at rewarding people for being nice to nature will likely miss the real target.

For approximately four decades a number of us have been engaged in a protracted discussion about the meaning and the performance of common property regimes. Starting with Garrett Hardin's mis-named allegory of the commons, the development community—and a number of academics engaged with that community—have been quite sure that resource degradation was the plausible result of flawed property regimes [Bromley, 1991; Larson and Bromley, 1990]. And of course the immediate answer to this flawed regime of property rights was to impose the only property regime known to western development experts—private property. The “free-market” wing of the economics profession has been quite sure of itself in this regard. We are told that only private property rights will solve deforestation, rectify degraded rangelands, protect wildlife, restore desultory wetlands, protect endangered species, create incentives for investment in agricultural productivity, and rectify much else that ill the world. And now, in the extreme, we see writers such as Hernando De Soto reassure us that one defeats poverty by formalizing title [2000]. It is all rather too much. It is too much because the empirical evidence for such fantastical claims is virtually non-existent [Bromley, 2008a]. But empirical evidence has never interested those with convictions.

This is not the place for a detailed rebuttal of the outlandish claims for privatization and formalization. Some of my papers cited in the bibliography will accomplish that. But it is appropriate here, in the few minutes left to me, to draw your attention to a paper that will appear soon in the journal Environment and Development Economics. In that paper I develop a fairly simple model to demonstrate that with only one or two quite plausible assumptions, we can observe a trajectory of resource degradation even under the very best conditions of individual behavior on the part of those embedded in poor habitats. In other words, I can start with well-intended and community-motivated behavior on the part of poor villagers and by introducing an assumption about flawed markets for agricultural inputs and agricultural produce, I can set in motion a trajectory of behaviors out on the ground that will generate resource degradation. Simply put, my model explains degradation as the result of economic processes that have nothing to do with the motives of the poor embedded in a particular ecosystem. Rather, degradation is the result of market failures situated between the rural village and the urban market. This means that efforts focused on the behavior of individuals situated in ecosystems of compelling interest to us are quite likely to have no discernible effect on behaviors with respect to nature [Bromley, 2008b]. If individual motives and desires are not implicated in destructive behavior then rewards for better motives and desires are seriously misplaced.

To put it another way, constructive or destructive behaviors out in the bush are dominated by the economic environment within which villagers are situated. Villagers are, in essence, powerless to modify their behavior even with the promise of particular rewards for doing so. The system is stacked against them. Deforestation has little to do with flawed property rights, with relative prices, with the construction of roads, or indeed with all of the usual suspects. Deforestation happens because national governments have their reasons for making sure that it

happens [Bromley, 2006]. Governments can earn much-needed foreign exchange, and they can relieve landlessness. All of the standard prescriptions for stopping deforestation are the result of flawed diagnoses. If the wrong diagnosis is made, the medicine cannot possibly do good work.

In summary, the essential point here is that those individuals whose behavior we seek to modify are being used by us to accomplish our purposes. That fact alone is sufficient to turn them into instruments of our desires. The fact that we put them on the payroll, as it were, does not change the nature of our relation to them—and their objectification by us. The issue here, as with so many interactions between the rich North and the poor South, concerns human dignity. There is an enormous constituency for altering behaviors in the South so that it leads to the protection of those parts of nature that we have come to value—game parks in Africa from which local people have been evicted, bio-reserves somewhere else, fragile lands in another setting. We may notice a less vibrant and less aggressive constituency advocating for the poor struggling to survive in habitats that we have suddenly valorized. Please do not tell me that the World Bank and the bi-lateral donors represent sufficient advocates for the poorest of the poor. If that were plausible then half-a-century of development assistance would have something to show us in terms of enhanced livelihood prospects for those at the margins of survival. They cannot convince us of their successes in this regard.

And of course this lack of success from traditional development programs would suggest that the sort of efforts that bring us together here today and tomorrow may be just the right avenue for mutual gains in the future. But success, if it is to come, will require thick and durable collaborative arrangements. I hope my comments this morning help you to see why such collaboration is an essential aspect of any promising program.

References

- Bromley, Daniel W. 1991. Environment and Economy: Property Rights and Public Policy, Oxford: Blackwell.
- Bromley, Daniel W. 2000. "Can Agriculture Become an Environmental Asset?" World Economics 1(3):127-139.
- Bromley, Daniel W. 2006. Sufficient Reason: Volitional Pragmatism and the Meaning of Economic Institutions, Princeton: Princeton University Press.
- Bromley, Daniel W. 2008a. "Formalising Property Relations in the Developing World: The Wrong Prescription for the Wrong Malady," Land Use Policy, (forthcoming).
- Bromley, Daniel W. 2008b. "Resource Degradation in the African Commons: Accounting for Institutional Decay," Environment and Development Economics, (forthcoming).
- Coase, Ronald. 1960. "The Problem of Social Cost," Journal of Law and Economics 3:1-44.
- de Soto, Hernando. 2000. The Mystery of Capital, New York, Basic Books.
- Ecological Society of America. 2000. Ecosystem Services: A Primer, <http://www.actionbioscience.org/environment/esa.html>.
- Larson, Bruce A. and Daniel W. Bromley. 1990. "Property Rights, Externalities, and Resource Degradation: Locating the Tragedy," Journal of Development Economics 33(2): 235-62.
- Olson, Mancur. 1996. "Big Bills Left on the Sidewalk: Why Some Nations are Rich, and Others are Poor," Journal of Economic Perspectives, 10(Spring):3-24.