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Ching-Ping Tang
National Chengchi University, Taiwan
Shui-Yan Tang
University of Southern California

Managing Incentive Dynamics for Collaborative Governance in Land and Ecological Conservation

Ching-Ping Tang is Distinguished Professor of Political Science, director of the master's degree program in Asia-Pacific studies, and associate dean of the College of Social Science at National Chengchi University (Taiwan). He is also editor in chief of *Taiwanese Political Science Review*. He has published in several different fields, including sociology (*Human Ecology*), environmental studies (*Environment and Planning A*), area studies (*China Quarterly*), developmental studies (*Journal of Developmental Studies*), and political science (*Comparative Politics*). He holds a doctorate from the University of Southern California.
E-mail: cptang@nccu.edu.tw

Shui-Yan Tang is Frances R. and John J. Duggan Professor in Public Administration in the Sol Price School of Public Policy at the University of Southern California. His research focuses on institutional analysis and design, common-pool resource governance, and collaborative governance. He is author of *Ten Principles for a Rule-Ordered Society: Enhancing China's Governing Capacity* (China Economic Publishing House, 2012) and *Institutions, Regulatory Styles, Society, and Environmental Governance in China* (with Carlos Lo; Routledge, 2014).
E-mail: stang@usc.edu

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Public governance often involves policy tools and stakeholders from multiple sectors. How different policy tools are used may affect the chances that the values and interests of diverse stakeholders can be aligned in mutually supportive ways. Drawing on insights from behavioral and cognitive economics, this article uses the case of land and ecological conservation in Twin Lake, Taiwan, to illustrate how various interactive dynamics—hierarchical exclusion and preemptive effects—may affect efforts in land and ecological conservation involving stakeholders from multiple sectors. Such illustrations may inform the choice and sequencing of policy tools for facilitating collaborative governance.

Collaborative governance has been a major focus of research in public administration in the past decade. The special issue of *Public Administrative Review* on "Collaborative Public Management" in 2006 featured major research topics in negotiation, conflict resolution, dispute system design, and consensus building (O'Leary, Gerard, and Bingham 2006, 8). An important topic mostly left out of that special issue concerns stakeholders' incentives for collaborative partnership. Creating the right incentives for stakeholders to work with each other is crucial for the success of collaborative governance. Developments in psychology and behavioral and cognitive economics in past decades have also highlighted the complex interactive dynamics among different forms of incentives. Yet knowledge about these complex dynamics has seldom been applied explicitly to study collaborative governance issues. This article is an attempt along this direction, focusing on a specific type of governance task: land and ecological conservation.

Ecological conservation is inevitably intertwined with land-use issues, as species habitation and migration patterns seldom coincide with jurisdictional and landownership boundaries. In the United States, given the cross-jurisdictional nature of biodiversity issues and the legal threats associated with the Endangered Species Act, agencies from different levels of government increasingly have been motivated to work together to develop and implement programs for supporting biodiversity (Thomas 2003). The matter becomes more complicated when landownership is taken into consideration, as more than half of the species on the endangered species list have at least 80 percent of their habitats on private lands (Innes, Polasky, and Tschirhart 1998, 35; U.S. Fish and Wildlife Service 1997).[1]

Ecological conservation is inevitably intertwined with land-use issues, as species habitation and migration patterns seldom coincide with jurisdictional and landownership boundaries.

This fact creates many potential conflicts between nature conservation and land-use rights. Similar problems appear in many other countries; solutions to these problems often require coordinated efforts from multiple stakeholders across different sectors.[2] Land and ecological conservation can thus serve as a valuable window for examining crucial issues in collaborative governance (Ansell and Gash 2008; Emerson, Nabatchi, and Balogh 2012; Thomson and Perry 2006). There has been a steady stream of studies in public administration using this policy arena as the context for understanding collaborative governance (Imperial 2005; Jung, Mazmanian, and Tang 2009; Thomas 2003; Thomas and Koontz 2011; Weber 2009). This article adds on to this stream of research by highlighting the need for managing incentive dynamics in promoting collaboration in land and ecological conservation.

There are many possible ways to coordinate efforts in land and ecological conservation. The regulatory approach usually involves statutes or zoning regulations limiting the types of activities allowed in specific areas. It may also involve the use of eminent domain, such that private landowners are required by law to sell their lands at fair market

prices to a government or a publicly endorsed entity, which can manage the purchased lands according to specific public interest purposes. Another approach involves voluntary transactions of property titles or easement contracts between landowners and other stakeholders.

A third and increasingly popular approach combines both regulatory and voluntary elements by involving stakeholders from multiple sectors using a wide array of incentives. This approach has been characterized in different ways—from "collaborative public management" to "collaborative governance" and "place-based collaboration" (Agranoff and McGuire 2004; Ansell and Gash 2008; Delfin and Tang 2006; Fairfax et al. 2005; O'Leary, Gerard and Bingham 2006). Underlying these "collaborative" approaches is the understanding that conservation values cannot be pursued without considering how they can be coordinated with various production and land-use values (Norton 2000). To reconcile potential conflicts between the two sets of values, collaboration is needed among government agencies, nonprofit organizations, and private actors such as landowners, residents, and individual donors.

Much has been written on the potential of collaboration for solving complex public problems (Ostrom 1996; Smith 2009; Weber 2009; Weber and Khademian 2008). Although much has been written on the potential of cross-sectoral collaboration for public problem solving (Bryson, Crosby, and Stone 2006), not enough attention has been paid to the fact that actors from different sectors are driven by different values and incentives (Bresnen and Marshall 2000; Fleishman 2009). Calls for collaboration can bear fruit only when different values and incentives are aligned in mutually supportive ways. In this article, we use the case of Twin Lake in Taiwan to illustrate the difficulties of fostering such alignments and how these difficulties can be overcome. The case involved conflicts among multiple stakeholders—governments, conservationists, landowners, and farmers. Different approaches to resolving the conflicts were attempted, with each creating different mixes of incentives for key stakeholders and different prospects for conflict resolution. In the rest of this article, we first explore the incentive features of different approaches to land and ecological conservation. Next, we present the Twin Lake case, and then we conclude by discussing several scenarios of incentive dynamics as illustrated in the case.

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Incentive Bases for Land Conservation

As mentioned earlier, three basic approaches to land and ecological conservation can be identified: regulatory, voluntary, and collaborative. Each of these approaches has its own incentive problems and dynamics.

The Regulatory Approach

The regulatory approach involves the use of government authority to address externality problems associated with land-use issues. This approach may involve the use of regulations that limit land use. In most suburban communities in the United States, for example, most lands are zoned for noncommercial and nonresidential use (Altshuler, Gómez-Ibáñez, and Howitt 1993). To convert a piece of land to commercial or residential use often requires specific approval by a zoning board. While zoning regulations can be used for achieving conservation purposes, they are blunt instruments because they can prevent landowners from using a piece of land in certain ways but cannot create incentives for landowners to take proactive measures for specific conservation purposes.

The regulatory approach may also involve mandatory takings of private lands, with "just compensation," through the application of eminent domain. Mandatory takings through eminent domain are more commonly used for developmental rather than pure conservation purposes, as the former can generate extra tax revenues to help compensate landowners. Regardless of costs, a major drawback of regulatory takings is that their extensive use may diminish the institutional credibility and long-term efficiency of a market system based on secure property rights (Epstein 1985; Goeschl and Igliori 2006). Fairness is also a concern. Compulsory takings in a democratic regime may involve majoritarian exploitation of minority property owners—that is, the will of the majority or of the winning coalition is imposed on a small number of property owners without due consideration of their circumstances and interests (Fischel 1995). A concern for justice thus calls for measures such as stringent legal limits on eminent domain to counteract such power imbalance (Thompson 1990).

Another drawback of regulatory takings is that they may involve various financial, legal, and political obstacles. Financially, with escalating land values in many places, it often becomes prohibitively expensive for governments or other stakeholders to raise sufficient funds to compensate landowners with fair prices for their lands. Prohibitive costs often dissuade elected officials and the voting public from supporting such takings. Legally, it may cost large amounts of resources and time to convince the court to support an eminent domain application. Politically, even after the court has approved a compulsory taking motion, unwilling property owners may still resist by staging individual resistance or collective protests.

As noted by Bengston, Fletcher, and Nelson (2004), regulatory approaches can take many forms. In most cases, in order for them to be effective as a tool for land conservation, regulatory approaches have to be coordinated with other policy instruments and involve relevant stakeholders in their formulation and implementation.

The Voluntary Approach

The voluntary approach involves market transactions between landowners and other stakeholders. These types of transactions are often facilitated and motivated by government-provided incentives (Gustanski 2000). In California, for example, the Land Conservation Act of 1965—commonly referred to as the Williamson Act—provides property tax reduction incentives for private landowners to enter into easement contracts with local governments to restrict their lands for agricultural or open-space use (McLaughlin 2002; Merenlender et al. 2004). The local government can also receive an annual subvention from the state for the forgone property tax revenues. In other cases, local nonprofit land trusts may obtain funds from multiple sources—individual donors, foundations, and funds from government conservation programs—and

negotiate directly with landowners to purchase title or easement rights from them (Delfin and Tang 2006). In some cases, landowners may be willing to sell their lands or enter into easement contracts for what they believe to be under-market prices if they share the buyers' conservation goals (Brewer 2003).

A major problem with voluntary transactions, however, is that the sellers' priorities are often the controlling factor (Fairfax et al. 2005, 10). Although one landowner is willing to sell his or her land or put it under easement, conservation goals may not be attainable if the owners of adjacent lands are not willing to sell. Voluntary transactions are also subject to the holdout problem—when many individual transactions are needed to complete a project, any one landowner may hold up the entire project by refusing to sell. That same individual is also the one who can ask for the highest price from the developer (Fischel 1995). Furthermore, widespread use of easement purchases also creates an expectation among landowners that they are entitled to compensation for not developing their land, even though they might not have any plan to do so in the first place (Fairfax et al. 2005; Freyfogle 1996). Another common complaint against easement purchases is that even though they often involve public funds, they are considered private transactions, and the public is often kept from the details of the terms of transactions (Morris 2008).

The Collaborative Approach and Dynamics of Incentives

If used alone, both the voluntary and regulatory approaches have their strengths and limitations in relation to biodiversity conservation on private lands. A corollary is to develop a policy regime that combines tools from different approaches to take advantage of their relative strengths while avoiding possible drawbacks (Bengston, Fletcher, and Nelson 2004; Knoke 1988, 316). What is yet to be fully explored is how different tools may work together. The collaborative approach involves multiple stakeholders from different sectors and a mix of incentives embedded in different policy instruments (Delfin and Tang 2006; Gunningham and Young 1997; Norton 2000; Press 2002; Smith 2009); to be effective, different incentives must complement each other. The recent literature on behavioral and cognitive economics challenges the assumption that different incentives simply add up to motivate desirable behaviors.

Incentives can be sorted broadly into two categories: material and nonmaterial. Material incentives refer to such tangible rewards as money and goods and services that can be easily measured in monetary terms (Fehr and Fischbacher 2002; Wilson 1995, 33). Nonmaterial incentives include solidary drivers such as relatedness (Hill 1987), status (Frank 1985), and identity (Akerlof and Kranton 2000), and purposive drivers such as pride (Bénabou and Tirole 2002), competence (Arnold 1985), self-determination (Ryan and Deci 2000), image (Meier 2007), and ideology (Wilson 1995). Different kinds of incentives can work independently to motivate behaviors. When multiple types of incentives are invoked, their interactions may lead to quite surprising results.

Although a synergetic effect is possible under some conditions (Amabile 1997), there may be conflicts between relevant incentives. A prominent example is the crowding-out effect that arises when concrete, instant rewards or punishments overwhelm the effects of intangible, long-term incentives. A famous example is Titmuss's (1970) study on blood donation, which showed that altruism may be undermined by monetary rewards.[3] Frey and his colleagues (e.g., Frey 1997; Frey and Jegen 2001; Frey and Oberholzer-Gee 1997; Frey and Meier 2004) followed the same line of arguments and garnered considerable empirical evidence demonstrating the crowding-out effect in many circumstances.

This literature may inform strategies related to the simultaneous use of multiple incentives for promoting ecological conservation. The voluntary approach involves two usual policy tools—land-title transactions and easement contracts. For either tool, both material and purposive incentives may be involved. The buyers—representatives of a government agency or a nonprofit land trust—are motivated by broader conservation purposes, but they are also concerned about cost management. The potential sellers may want to maximize returns on their investments and are strongly influenced by business calculations. In this case, material, "exchange" incentives dominate. Alternatively, the potential sellers may want to support conservation causes; thus, two types of incentives, material and purposive, might work together to create a synergetic effect. Nonetheless, if potential sellers have developed an initial expectation of a lucrative price at the beginning, the resulting anchoring effect (Kahneman 2011; Switzer and Sniezek 1991) would make it difficult for them to reverse the initial expectation; in this case, an appeal to conservation values may have little effect on the sellers, creating a situation of material incentives crowding out nonmaterial incentives.

The regulatory approach usually involves mandatory takings and land-use restrictions. In both cases, landowners are subject to instant and often substantial financial losses. When landowners are preoccupied with countering the threat, they are less likely to consider nonmaterial motivations, thus crowding out the potential incentive effects of broader societal and conservation purposes. In addition, regulatory takings can easily create a perception of unfairness among the landowners. Such negative perceptions may be long-lasting and generate distrust toward subsequent government policies.

When elements of both voluntary transactions and regulatory takings (or the threat of them) are used together in a collaborative approach to conservation, the potential for the aforementioned crowding-out problem must be recognized. In this regard, two kinds of issues must be managed. First, once the regulatory approach is adopted, hostilities may ensue, thus undermining the viability of nonmaterial incentives. The chances of achieving the synergetic effect of combining multiple incentives are diminished. A reasonable proposition is that the sequencing of policy tools matters; in particular, the regulatory approach is better used as the last resort. Second, if different incentive-based policies are to be applied at the same time but to different stakeholders, the caveat is to prevent hostile responses against regulatory takings to spillover from one group of stakeholders to another, making it difficult for collaborative solutions to emerge.

In this article, we illustrate these and related arguments using the case of Twin Lake in Taiwan. The case involved multiple stakeholders—governments, nonprofits, and private landowners—that were involved in resolving conflicts between private landowners and efforts to preserve a wetland ecosystem. Between 2007 and 2012, one of the authors and his graduate assistants made multiple trips to

the site to conduct interviews. Extensive efforts were made to interview all of the major groups of actors in the case. We conducted a thorough search of government documents[4] and media reports.[5]

After an initial reading of the key documentary sources, we identified several critical actors related to the case. Initial interviews with these actors helped us develop a list of all of the key groups of actors whose views we needed to understand for developing an objective understanding of the case. Because the case involved substantial conflicts among different actors and some legal issues, not all of the actors we identified were initially willing to talk to us. After some persuasion and personal referrals, we were subsequently able to interview all those we initially planned to interview, except for the lake owner. Our interviewees included the county magistrate, three government officials, a central government legislator advocating for conservation initiatives, a homestay owner, several small farm owners (with and without restaurant businesses), environmentalists (organizational cadres and nonmember nature lovers), and a scholar familiar with the ecological issues related to the case. A major stakeholder, the lake owner, declined to be interviewed; we consulted his memoir (Wen 2003), which includes documents that he collected in his legal battles with the government, descriptions of his attitude toward nature conservation, and his overall opinions about the case. See appendix A for a detailed list of interviewees.

For each formal interview, we mailed the interviewee a list of questions ahead of time. In the actual interview, we asked additional questions when necessary in order to follow up on issues raised by the interviewee and to cross-check what we learned from others. With the interviewees' consent, we tape-recorded most of the interviews, and the recording was later transcribed. The transcribed texts helped us check for possible inconsistencies across interviewees. In addition to formal interviews, we also had casual chats with villagers and environmentalists during our field trips. These casual chats helped us double-check and put into perspective what we learned from the formal interviews. One of the several graduate assistants was a volunteer for the major conservation association in the case, the Society of Wilderness; she was familiar with details of the association's conservation activities.[6]

After detailing the case in the next section, we will examine in the Discussion section lessons from the case in regard to how incentive dynamics and the sequencing of conservation approaches may affect the likelihood of successful collaborative conservation.

The Case

Located in the mountainous area of northeastern Taiwan, Twin Lake has long been famous for its distinctive ecological environment. As a small source lake surrounded by mountains,[7] it serves as a relay station for migrating birds. The surrounding area received seeds of many kinds of exotic plant species carried there by migrating birds. Many of these exotic plants adapted to the indigenous environment, creating a unique ecosystem. With more than 70 kinds of aquatic plants (about one-third of the total number of species found in Taiwan), including many rare species,[8] this place is a valuable site for botanists. Being home to the medaka species (Japanese rice fish), once thought to be extinct, and several endangered animals,[9] the place is also valued by zoologists. Yet the most distinguished ecological feature of the place is the floating island on the lake. The island was formed when many aquatic plants clustered together to absorb humus materials in the water, and ferns interweaved them into vegetal mats that floated on the lake once the water level rose. The mats further served as nourishing bases for a wide variety of creatures, forming a unique ecosystem. All of these ecological features made the lake a shining gem in the eyes of scholars and conservationists.

Phase One: Regulation and Eminent Domain

This precious ecosystem has long been under private ownership. Immigrants began to settle in this area about a century ago during the Japanese colonial period and gradually created arable lands by draining part of the lake.[10] Although the lake had shrunk substantially in the past century, the ecosystem was left mostly intact because the lake continued to serve as a major source of water for nearby agricultural activities.

The threats of human settlement loomed large in the late 1980s, when this place became famous after serving as the filming site of several movies and being highlighted in several travel programs on television. Adopting a green development strategy at that time, the local government of Yilan County planned to develop this place into a recreational resort serving both conservational and educational purposes. Ironically, once revealed, this plan attracted outside investors who tried to acquire the lands in anticipation that subsequent rezoning and developments would bring them heavy windfall profits.

Several urban investors eventually gained ownership of large parcels of land in the area. Among the new owners was an engineer who had once been amazed by the scene when performing fieldwork in the area. He purchased 17 hectares of land that included the lake itself and the surrounding lakeshore wetland. After letting his property idle for several years, the new owner retired from his work as an engineer in the early 1990s and initiated economic activities there, which conservationists considered a threat to the local ecological system.

His first step was to try to turn the lake into a fish farm. To extend the lake's capacity for raising fish, he hired an excavator to remove silt from the lake and did some reinforcement work on the lake bank. As this lake and its surrounding area had been specified as a catchment zone and were under the protection of several laws and ordinances,[11] the local government tried to stop his action by imposing a heavy fine on him for not obtaining an official permission in advance. To counter this intervention, the owner filed an administrative petition claiming that the government's fine was an illegal infringement on his property rights. He subsequently won the petition in court, and the government was forced to recant the sanction.

The owner's legal victory gave him confidence to resist government interference and initiate further actions in subsequent years. In an attempt to drastically increase the value of his property, the owner applied for a rezoning of the area to be eligible for construction. After several futile applications, he began to drain water from the lake in 1993, presumably as a credible threat to aid his negotiation with the regulating agencies, as well as a test on the limit to which he could exercise his rights on his property. His action upset the county magistrate, who later accused him of violating the Water

Act. Nevertheless, the public prosecutor later dropped the case and endorsed the owner's argument that he had the right to drain water from his property when irrigation water for nearby farms could be accessed from alternative sources.

The owner's repeated legal successes were apparently aided by a judicial system that was less than enthusiastic in supporting conservation values.[12] The ruling would have been quite different if the same legal cases had been tried in, say, the California court system, which is known to be highly supportive of conservation (Fischel 1995). In any event, these legal successes encouraged the owner to take additional actions to enhance his rights to further develop his property, including filing suits against specific in-charge officers who tried to block his development projects on the site.

Throughout the period, the owner was not alone in his fight with the government. Farmers in the surrounding area were also concerned about the government's original plan to turn the area into a recreational resort. From the farmers' perspective, the plan implied that the government might take away their lands through eminent domain but with minimal compensation, thus undermining their very livelihood. Support from these farmers partly explains why the owner was successful in many of his early legal fights with the government.

Phase Two: Voluntary Transactions

Starting in 2001, the owner built a floating dock on which an excavator could operate to eradicate the vegetal mats and aquatic plants on the lake. He also used herbicide to clean the "weeds" on the wetland around the lakeshore. Alarmed by these actions, a botanist who had been a longtime researcher on local wetlands partnered with some local environmentalists and launched a "rescue mission" by collecting and sorting plants from the area and sending them to several shelters for restoration.

The rescue mission attracted further public attention, and conservationists, led by the Society of Wilderness headquartered in Taipei, quickly launched a fund-raising campaign called "One Dollar for an Aquatic Plant." Modeled after Western-style local land trusts, they tried to solicit small donations from students and the public so that they could either purchase the property or reach an easement deal with the lake owner. The campaign failed, however, for several reasons. First, the owner did not share the conservation values of the environmentalists. He never acknowledged that his property had any ecological value, and he condemned the conspiracy of the conservationists and local politicians who used public authority to take his land. In his own words,

> The lake has been developed for the past century; hence it is no longer nature. It became wasteland just because of the Yilan County government's oppression. (Wen 2003, 202)
>
> "Raising funds to purchase wastelands and to preserve natural species" is just nonsense to the extreme. Taiwan has a whole lot of state-owned wastelands to serve this purpose. (203)

Second, given that the owner viewed his land investment from a pure "exchange mode," the environmentalists faced the dilemma that a hugely successful fund-raising campaign would simply raise the expectation of the owner and lead him to demand a higher price for his property. Indeed, before the campaign, no one was sure about the property's "fair" price. Once the unique ecological value of the habitat was publicized, it made sense for the owner to adopt a holdout strategy to maximize the price for his property. In other words, the more successful the fund-raising campaign became, the greater the amount of funds would be available, and the greater the profit the owner could make from his land.

Nonetheless, the campaign turned out not to be very successful after all, as the Society of Wilderness was based in Taipei and did not have strong enough local connections. In addition, potential contributors were afraid that the more money they gave, the more expensive the deal would become. Without sizable amounts of money available, the Society of Wilderness was unable to close any deal with the owner. From the owner's perspective, there was no need to hurry into any deal because there was another potential buyer—the government—that was under public pressure to reach a deal with him.

Third, the government's original plan for developing the area into a recreational resort was aborted because officials subsequently believed that it would undermine valuable ecological features of the area. But this original plan had lingering effects on the negotiation process. Unlike local small farmers, who would be worried about their means of livelihood being disrupted by such a plan, the urban investor saw it differently. If the plan for a recreational resort were to be implemented, it would be to the lake owner's advantage for his property to be taken by eminent domain, as it would be highly likely that he could trade the lake and wetland he owned for a piece of dry land with less development restrictions. He would likely be able to use the dry land to run a homestay or restaurant business.[13]

With these strategic considerations in the background, the owner continued to initiate different types of projects on his property, including the introduction of herbivorous fish into the lake, which, according to the conservationists, would feed on the aquatic plants and destroy the vegetal mats. But apparently, regardless of what projects he initiated, the owners stopped short of entirely destroying the original ecological setting. By doing so, he would have killed the hostage—or, in other words, undermined the fundamental value of his property as an ecological preserve.

Phase Three: Toward Collaboration

After the effort to raise funds to buy the property or easement from the owner failed, the environmentalists turned their focus to lobbying the government to establish a wildlife refuge in the area. They believed that once a wildlife refuge was established, any development projects would be banned, and the ecosystem would be safe. The problem, however, was that this area had long been settled by farmers, and most of the lands were privately owned. Acquiring those lands would inevitably involve huge budgets, strong resistance, and intense political confrontation, potentially creating a headache for the newly democratized regime.

The idea of establishing a wildlife refuge gradually gained widespread public support as the tug-of-war between the lake owner and the environmentalists became widely known. Recognizing the

financial and political obstacles to establishing a wildlife refuge, the county government eventually worked out a seemingly more feasible alternative under the title of "protection area." Rather than rezoning and procuring large chunks of land and turning them into a wildlife refuge, the proposed protection area would divide the habitat into a core and a buffer zone with mixed property rights arrangements. Only the core area—the lake together with the surrounding wetlands—would be acquired from the private owner by eminent domain. A huge area adjacent to the core, including both publicly owned forests and privately owned farmlands, would be the buffer zone without public acquisition, but activities harmful to wildlife and native ecology would be listed and prohibited. From the farm owners' perspective, the plan amounted to an uncompensated easement, as it would severely attenuate the use rights to their lands but without compensation.

As mentioned earlier, local farmers originally sided with the lake owner in opposing government conservation plans because they feared that the government might take their lands through eminent domain with minimal compensation. By dividing the habitat into core and periphery, the new plan for a protection area was supposed to isolate the lake owner from the farmers. Because the lake area was the only target for acquisition, the government stopped negotiating with the lake owner and sought to acquire his property by eminent domain. In addition to launching business activities and undertaking remedial works on the lake embankment as a way to assert his property rights, the owner filed suits against the government, but he failed. As to the farmers, the government assured them that no acquisition would be made. While some restrictions would be imposed on farming activities, farmers were expected to accept the inconvenience because the threat of losing their property had been lifted. Landlords in the current property rights regime were used to all kinds of restrictions associated with zoning and other regulations; restrictions on the use of pesticide and herbicide or on killing wildlife were only minor issues that would not hurt property values at all. In return, the government would help the farmers develop ecofarms so that they could grow organic produce and earn higher incomes.

Although the lake owner was isolated, as expected, to the government officials' surprise, the local farm owners were still dissatisfied and organized protests on their own. A key reason was that the small farm owners were ultimately unsure about how much the designation of a protection area might undermine their property values. They also opposed the idea that they had no right to expel the birds and other animals that devoured their harvest. A grassroots self-salvation organization was organized by the local farmers, and vehement protests were orchestrated in the following years. During this period, rumors about the government's intention to acquire private lands kept circulating, which fomented misgivings and anticonservation sentiments among the local farmers.[14]

Phase Four: Collaboration

To save the rapidly deteriorating ecological system in the area, the government took another policy turn in 2004 by excluding private lands from the protection area. In other words, the core would be surrounded by a nonprotected zone consisting of private farms, about 115 hectares. This nonprotected zone would, in turn, be surrounded by publicly owned forests as the periphery, about 617 hectares. Some environmentalists considered this a disastrous policy because the nonprotected zone would be a major loophole for conservation purposes. Some others, however, were not so pessimistic and believed that remedies could be made by engaging the farmers in collaborative efforts.

One such effort was to help farmers grow environmentally friendly yet high-priced agricultural products. In previous experiences of rescuing aquatic plants from the lake, one conservationist from the local chapter of the Society of Wilderness learned how to nourish one special species, *Brasenia,* that has high economic value. A delicacy in Japanese restaurants, the plant had been growing well in this area.[15] It occurred to the conservationists that if local farmers could make a living by growing this plant, they would have a strong incentive to maintain an environment suitable for it and other rare species. As *Brasenia* was restored in the backyard of one of the farmers, and his restaurant was making profits by serving special dishes of this plant, the antagonism of local residents toward the environmentalists and conservation ideas was gradually reduced. To protect their cash crops, local farmers began to share the concern of saving the indigenous ecological system. As more community members were able to run businesses to benefit from increasing numbers of tourists, they realized that it was in their best interest to protect the special ecological features of the lake, its floating island, and many rare species of aquatic plants in the area.

In the end, the lake and the surrounding wetlands were turned into government property, and the owner was compensated for a total price of 80 million New Taiwan dollars, which was considered to be a fair market price by many. The owner initially refused and filed suits against the government. This time, however, neither the court ruling nor the local political landscape favored him. The environmental movement in recent years has gradually tilted the court toward supporting ecological causes;[16] the farmers no longer wanted to support the lake owner after feeling betrayed by his earlier efforts in trying to reach a profitable deal with the government.[17] Disappointed by the situation, the lake owner emigrated abroad. Conservationists are now involved in overseeing the local ecological system. A recent project involved efforts to remove alien fish species from the lake. The Wilderness Society tried to reconcile with local farmers by bringing business to them through regular environmental education programs in the area. The area did not become a major tourist destination, as some had feared. The farmers can therefore return to their traditional way of life, with a largely harmonious relationship with indigenous ecological features and the endangered species.

Appendix B provides an overview of the case; it includes the key events and actions of the four key groups of stakeholders in each of the four phases. The last row of the table highlights the evolution of major incentives for each group of key actors. The last column highlights the interactive dynamics among key actors in each phase.

Discussion

Most scholars, policy makers, and conservation practitioners are now well aware of the needs to employ multiple policy tools and to create synergy among public, private, and nonprofit actors for developing successful land and wildlife conservation programs; yet more research is needed to understand how the use of different policy tools may affect the chances that values and interests of

diverse stakeholders can be aligned in mutually supportive ways. This is true not just for conservation issues but also for many other public policy problems that require collaborative approaches for resolution.

The utilitarian tradition has long assumed that incentives, both positive and negative, are exogenous to a decision situation and shape individual decisions in a straightforward manner.

The utilitarian tradition has long assumed that incentives, both positive and negative, are exogenous to a decision situation and shape individual decisions in a straightforward manner. This assumption implies that diverse incentives for actors from different sectors to pursue cross-sectoral collaboration can be naturally aligned for any given policy goal. Our study sketches a more complicated picture. In the Twin Lake case, the government possessed the financial resources and power for regulatory takings, and the conservationists could mobilize public support and provide professional help to farmers for practicing ecologically sound agriculture. The resources at their disposal appeared to be complementary, and their joint efforts should presumably be synergetic. In reality, however, their collaboration and early policy tools failed to produce positive outcomes mainly because they created inflated expectations—that is, extraordinary material rewards—for a number of private actors. Specifically, the government project for developing a recreation resort attracted speculative investors who wanted to gain from it, and the "One Dollar for an Aquatic Plant" campaign organized by the conservationists further hardened the lake owner's resolve to seek large monetary compensations. In other words, good intentions from different sectors did not translate into successful collaboration.

Some incentives may be mutually supportive of each other initially; after some time, however, one incentive may become dominant and wash out other effects.

As shown in figure 1, at least four scenarios can be identified if one assumes that incentives work interactively. Among them, "synergetic" and "crowding-out" effects have been documented extensively. "Hierarchical exclusion" and "preemptive" effects are well known in psychology; they have largely been neglected by the policy literature but figure prominently in this case.

Synergetic Effects (A Mutually Supportive Scenario)

Incentives may reinforce each other in some circumstances. As shown in psychological studies, a pricing mechanism based on fair distributions may help generate honest, disciplined, and helpful attitudes (Hirschman 1982). This is the most desirable scenario for policy makers. Although some practical suggestions have been offered in the education policy literature (Amabile 2001), how this ideal result can be accomplished requires further exploration.

Patterns of Incentive Interactions				
Interdependent				Independent
Synergetic effects	Crowding-out effects	Hierarchical exclusion effects	Preemptive effects	

Figure 1 Patterns of Incentive Interactions

Crowding-Out Effects (A Mix of Supportive and Conflicting Scenarios)

Some incentives may be mutually supportive of each other initially; after some time, however, one incentive may become dominant and wash out other effects. An undesirable consequence is that the individual is no longer motivated when the dominant incentive disappears. As argued earlier, extrinsic incentives reinforced by a competitive pricing system tend to undermine moral values such as a sense of solidarity or altruism (Hirsch 1976). The policy implications of the crowding-out effect have been explored in a wide variety of arenas, including social welfare (e.g., Titmuss 1970), culture and art (Frey 2000), counterterrorism (Frey 2004), and undesirable facility siting (Gneezy and Rustichini 2000).

Hierarchical Exclusion Effects (A Conflicting Scenario)

Individuals may respond to a specific hierarchical order of incentive types; they are unresponsive to other incentive types unless the most fundamental ones are first satisfied. Hierarchical exclusion effects have been studied quite extensively in the context of organizational management but rarely in policy formulation and implementation. Take Maslow's theory as an example (1943): physiological and safety needs rank as more basic than such higher-level needs as belongingness, esteem, and self-actualization. Similarly, Alderfer (1969) examines a priority sequence ranging from existence to relatedness and growth. In other circumstances, individuals may be preoccupied with certain strong emotions, which may override other concerns, leading them to commit apparently "irrational" acts (Elster 1998).

This hierarchical structure of incentives figured prominently in the Twin Lake case. At the initial regulatory stage, zoning regulation and eminent domain were used as the major policy tools. From the farmers' perspective, these policy tools threatened their basic livelihood. Security concerns became dominant and persisted throughout all subsequent stages, and these concerns trumped all other incentives at all of the stages. The farmers were not receptive to other incentives until their basic security concern was sufficiently addressed. At the beginning, government officials wrongly assumed that farmers would not oppose the recreational resort plan, which included a relatively good compensation scheme. Nor did they expect that the added restrictions of the protection zone plan would be opposed, even though the farmers could benefit from additional economic opportunities made possible by the new techniques promoted by nongovernmental organizations (NGOs) to grow ecologically friendly crops. Yet the farmers were apparently preoccupied with the basic security concern of being deprived of their major means of livelihood. Their resistance did not soften until the final stage, when the government gave up efforts to impose any

restrictions on their lands, thus removing a major threat to their safety nest. Subsequently, when one farmer began to benefit from the NGO's help, others gradually became less hostile to conservation practices.

Preemptive Effects (A Conflicting Scenario)

In some circumstances, stakeholders may not be attached to a permanent ranking of incentives; yet once certain incentives become prominent at an earlier stage, they may have long-term lingering effects that undermine the potency of other incentives in subsequent stages. For example, resentment over unfair treatment or a drive for revenge may undermine the appeal of material rewards even though the cause of the original resentment has been removed (Fehr and Gächter 1998). Individuals may also be preoccupied with a certain consideration (say, exchange or moral) and become less receptive to other considerations even though the circumstances that triggered the initial consideration no longer exist. Such preemptive effects were evident in the Twin Lake case. From the perspective of the urban investor, the initial attempt at regulatory taking and the creation of a recreation park led him to believe that he was entitled to a windfall profit from his investment. Such an exchange mind-set was later reinforced by the land trust campaign advocated by the conservationists, which created an opportunity to increase his return if the campaign were to succeed. As evidenced by many successful cases of land conservation in the United States, a combination of both material incentives (in the form of direct cash payments and tax benefits) and moral incentives (in the form of conservation values) is needed to motivate landowners to agree to sell their title or easement of their lands, often below market prices (Fairfax et al. 2005; Press 2002). In the Twin Lake case, the preemptive effect, together with his anger over the unfavorable governmental rulings on his petitions, prevented the investor from sharing the ecological values advocated by the government and conservationists.

This simple case does not illustrate all four interdependent scenarios. Nor can it specify precisely the conditions in which different scenarios may occur. Nevertheless, it can help frame a better understanding of many policy phenomena by highlighting some useful lessons. First, given the possibility of incentive conflicts, the sequencing of policy tools matters. Once a policy design is adopted, it engages the stakeholders with a specific form of incentive. Whichever incentive is invoked first, it may have lingering effects on subsequent developments, shaping the subsequent path. In this case, the threat of regulatory taking undermined the effectiveness of subsequent incentives. Although the threat was withdrawn rather quickly, its negative impacts, including the farmers' distrust toward the government, persisted until the onset of another critical juncture: the withdrawal of all government interventions. The preemptive effect demonstrated by the lake owner's responses also points to the importance of proper sequencing of policy tools. Specifically, eminent domain must be used with care. It may trigger emotional responses from socially disadvantageous groups, who are swayed mainly by a hierarchical exclusion effect; it may also engage speculative investors into an exchange mode, creating a preemptive effect. This does not mean that regulatory takings should never be used; instead, they are better used as a backup when other efforts have failed.

The second lesson is how the knowledge of incentive dynamics may help manage the holdout problem in local politics. It is not enough to create the right incentives for multiple stakeholders; incentives themselves may need to be adjusted when policy gridlock arises. Nevertheless, new incentives may not take effect if earlier incentives are still dominant. Although the lake owner was the only target for eminent domain at the later stages, the farmers still allied with him; as a result, he gained disproportional bargaining power in his fight against government policies. Their alliance endured despite the fact that these two parties had totally different interests and were driven by different incentives.

The lake owner was persuasive to the farmers by highlighting their common interests in defending their respective property rights. Emboldened by the cognitive obstacles associated with hierarchical exclusion effects, the farmers failed to figure out that their own interests were actually quite different from those of the lake owner. Being neighbors in the same community also helped build a feeling of solidarity between the farmers and the lake owner in the face of common threats from outside. Only after a major policy shift—a total withdrawal of government intervention—did such local bonds begin to loosen up.

The third lesson is how knowledge of incentive dynamics may inform strategies for fostering cross-sectoral collaboration. The key here is not just to "reconcile individual and collective interests" and "forge mutually beneficial relationships," as noted by Thomson and Perry (2006), but also to create mutually supportive incentives for different stakeholders. In the case, the government allied with conservationists in an attempt to preserve the lake's endangered ecology, yet their collective efforts were perceived as a threat to the farmers. At a later stage, the conservationists were disengaged from collaborative efforts with the government, which suffered from the social unrest triggered by earlier policy decisions. This disengagement actually signified their concern for the farmers and facilitated their subsequent efforts to convince the farmers of the economic benefits of ecologically sound agriculture. The government finally succeeded in purchasing the lake and its immediate surroundings through eminent domain after opposition from the farmers subsided.

Conclusion

Viewed from the lens of behavioral and cognitive economics, this case helps us decipher the motto of "self-interest rightly understood" by Alexis de Tocqueville (1945). Individuals perceive their enlightened self-interests differently depending on the sequence and manner in which potential threats, benefits, and losses are presented to them. A successful policy needs to invoke not just the right incentives but also present them in the right sequence and manner. It is never an easy task to achieve a perfect alignment of incentives among all stakeholders in public governance. Nevertheless, lessons from the case study can provide preliminary guidance.

Individuals perceive their enlightened self-interests differently depending on the sequence and manner in which potential threats, benefits, and losses are presented to them.

Although the "synergetic" and "crowding-out" arguments have been around for a long time, practitioners and scholars of public governance have rarely paid much attention to their implications for making effective policies. Nor have additional types of incentive dynamics been identified. This study contributes to the current literature by pointing out a direction for theoretical development in the field of public policy. Although adding two more types of incentive dynamics—hierarchical exclusion and preemptive effects—can hardly make it a comprehensive typology, this study suggests the need for more systematic efforts in identifying divergent types of incentive dynamics and understanding how these dynamics may contribute to better policy design.

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Notes

1. This pattern was partly a result of early federal government efforts to convert public lands in private ownership (see Clawson and Held 1957).
2. For South Africa, see Bond, Palerm, and Haigh (2004); for Latin America, see Nepstad et al. (2008); for Europe, see Plieninger, Höchtl, and Spek (2006).
3. An experimental study by Lacetera, Macis, and Slonim (2009) confirms that cash reward would trigger a crowding-out effect on blood donation, but other material incentives (e.g., vouchers) may not, indicating a more complicated picture of possible causal relationships.
4. The documents included written verdicts on the litigation between the land owners and the government, minutes of negotiation meetings and public hearings, official announcements of related policies, local histories, statistics for local development, and official Web sites (see, e.g., http://conservation.forest.gov.tw/ct.asp?xItem=3343&ctNode=176&mp=10).
5. In addition to newspaper reports, many blogs on the Internet were also essential sources of information regarding local and public opinions on the policies through different stages (see, e.g., http://www.wretch.cc/blog/ange1910806/21766542).
6. Her membership proved to be very helpful in gaining access to one side of the story. But we were cognizant of the potential bias that might result. Because the authors and several other graduate assistants were not affiliated with the NGO and were disinterested parties to the controversy, we believe that we were able to minimize the impact of the potential bias.
7. The water-covered area is about 7 hectares now. It was several times bigger before human settlement. As a source lake, it collects water from underground sources as well as creeks from nearby mountains.
8. For example, *Trapa bispinosa, Philydrum lanuginosum, Brasenia schreberi Gmel,* and Asian ambulia (see Huang and Lin 1999).
9. For example, the Chinese pangolin and small Indian civet.
10. Twin Lake used to have two conjoined parts, the upper and the lower lakes. As a result of human settlement, the lower lake was reclaimed to become private farms, while the upper lake was controlled by one of the settlers, who used it as a reservoir for irrigation.
11. Examples included the Slopeland Conservation and Utilization Act and the Water Act.
12. During this period, many other environmental disputes ended up with judges ruling against the environmentalists (see Tang and Tang 1999 for a case about golf course development). Being trained during the authoritarian era, most judges tended to regard public interest lawsuits as too radical. They also tended to adopt rigid interpretations of the legal codes to avoid criticism from superior courts.
13. He openly advocated a form of "zone expropriation," by which only a portion of the land and lake would be taken, or the government would grant another piece of land nearby to the owner for which he could use with less restrictions. Although this type of "offsets" measure may work for some infrastructure development projects, it was unlikely to work well for this particular bioecological project. For the legal definition of "zone expropriation" as it is used in Taiwan, see http://english.land.taipei.gov.tw/ct.asp?xItem=143450&ctNode=15333&mp=111002 (accessed August 30, 2013).
14. The distrust was not entirely unfounded because it was indeed the government's original plan to develop the area as a recreational area. The distrust intensified after a fake public announcement regarding land acquisition appeared.
15. Later research indicated that this plant also had skin care and cancer prevention value, making it even more popular.
16. In our interviews with conservationists, they indicated that the courts had become more favorable to environmental causes, for example, by upholding procedural requirements in environmental impact assessment.
17. Interview with a restaurant owner, April 10, 2009.

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Appendix A List of Interviewees

Category	Subcategory	Number	Note
Public officials	Central	1	A locally elected legislator at the legislative Yuan
	Local	4	The county magistrate, two high-ranking officers, and one retiree
Environmentalists	NGO	2	One from the headquarter, the other from a local branch
	Non-NGO	1	A nature lover who traced the ecological change on the scene
Community members	Landowner, investor	1	Lived in urban area but with villa and land in the community
	Landowner, farmer	2	
	Restaurant owner	1	The first restaurant that accepted help from an NGO
	Homestay owner	1	
Academics	Academia Sinica	1	A scholar in biodiversity

Appendix B Overview of the Case

	Lake Owner	Farmers	Local Government	NGOs	Interactive Dynamics
Phase One (regulation and eminent domain) Government announced plans for a recreational resort	Sought large monetary compensation from the government	Concerned about the threat of losing means of livelihood through eminent domain with minimal compensation	Interested in developing the area as a recreational resort serving both conservational and educational purposes	Interested in the ecological conservation value of the area	The government's recreational resort plan triggered (a) the lake owner's hope for large monetary compensation and (b) farmers' concern about eminent domain with minimal compensation. Although driven by different incentives, the lake owner and farmers found common ground in their fight with the government. Local government officials subsequently shelved the recreational resort plan to avoid triggering more farmer protests. NGOs noticed the area's conservational value but had yet to participate in any specific conservation efforts.
Phase Two (voluntary transactions) The Society of Wilderness launched the "One Dollar for an Aquatic Plant" campaign. The lake owner initiated excavation activities.	Sought large monetary compensation from either the government or NGOs	Concerned about use rights being restricted	Sought to put the area under "ecological conservation zone" protection and to echo the land trust campaign	Sought to place the area under land trust protection	The "One Dollar for an Aquatic Plant" campaign heightened the lake owner's hope for large monetary compensation. The government's plan to put the area under "ecological conservation zone" protection triggered farmers' concern about use rights being restricted. The lake owner and farmers still shared common ground in their fight against the government.
Phase Three (toward collaboration) The government established the area as a "protection area."	Sought to exert his property rights and to receive large monetary compensation	Concerned about uncompensated easement	Sought to establish the area as a "protection area"	Sought to turn the area into a wildlife refuge	The lake owner launched business activities as a way to assert his property rights; he also tried to block the government's plan to establish a "protection area." NGOs lobbied the government to turn the area into a wildlife refuge. Local farmers protested against the "protection area" designation.

Appendix B Continued.

	Lake Owner	Farmers	Local Government	NGOs	Interactive Dynamics
Phase Four (collaboration) The government acquired the lake and the surrounding wetlands through eminent domain. The government excluded private lands from the "protection area." Some farmers began to practice ecological agriculture.	Sought to exert his property rights and to receive large monetary compensation	Concerned about uncompensated easement subsided; became more interested in the economic return of ecological farming	Sought to establish the area as a "protection area," but now more sensitive to the farmers' concerns	Tried to promote ecologically sound agriculture among local farmers	The government's decision to exclude private farmlands from the "protection area" helped ease farmers' concerns. NGOs' efforts in promoting ecological agriculture became more effective once farmers' fears subsided. Farmers no longer wanted to work with the lake owner to fight with the government. The lake owner filed suits against the eminent domain acquisition but failed.
Developmental dynamics	Insistent on realizing large monetary returns on his property throughout the entire case (preemptive effect)	Initially preoccupied with maintaining their basic means of livelihood; more willing to consider other economic incentives once the initial fear subsided (hierarchical exclusion effect)	Interested in promoting the educational and conservation value of the area, but also concerned not to trigger unrest among farmers	Interested in preserving the ecological value of the area and gradually learned how to do it in more effective ways	