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An Institutional Framework for Policy Analysis and Design

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This chapter applies the Institutional Analysis and Development (IAD) framework to policy analysis and design. The IAD framework is the collective product of the many and diverse social scientists who have participated in the Workshop in Political Theory and Policy Analysis over the past twenty-five years. The interdisciplinary nature of these collaborations, the training and interests of Workshop scholars cross every discipline in the social sciences and a number of disciplines in the physical sciences, has produced a tool that can be used to analyze and design policy interventions in a broad variety of political-economic situations. Whereas past descriptions of the IAD framework have focused on its use as a research method, in this chapter, we develop it as a tool for policy analysts who are evaluating policy effectiveness, initiating policy reform, or designing new policy interventions.[1] The chapter proceeds as follows. The first section defines and motivates the subject of institutional analysis and policy design. The second section provides a brief overview of the IAD framework. We then develop a systematic process for policy analysis and design in the third section. Finally, we provide some examples of policy applications.

Institutional Analysis and Policy Design

Institutions are everywhere, governing our lives in fundamental ways. Yet, until fairly recently, policy analysis has often ignored the role of institutions in political economic behavior. Public choice scholars are among the first analysts in the twentieth century to grapple systematically with

the role of institutions in policy design.[2] Their analyses have been further invigorated by efforts over the past fifteen years to reintegrate the study of politics and economics as the interdisciplinary specialty of political economy. Variously known as public choice theory, social choice theory, and institutional economics, this work has led to a paradigmatic shift in policy analysis and design from supply-driven approaches, to institutionally driven approaches.[3] Mounting evidence from this work, applied to myriad public policy matters, suggests that policy work can be substantially improved if we include institutions in our analysis.[4]

Past oversight of the importance of institutions is due, in part, to the inherent difficulty of analyzing them. Conceptually, institutions are highly abstract and frequently invisible elements of the policy environment. Ostrom (1996b) identifies a number of challenges in this regard. First, the term "institution" is used in many ways. We define an institution as a widely understood rule, norm, or strategy that creates incentives for behavior in repetitive situations (Crawford and Ostrom 1995). Institutions may be formally described in the form of a law, policy, or procedure, or they may emerge informally as norms, standard operating practices, or habits. Alone or in a set of related arrangements, they are mechanisms for adjusting behavior in a situation that requires coordination among two or more individuals or groups of individuals (Hurwicz 1994). Because institutions are fundamentally invisible, shared concepts that exist in the minds and routines of participants in policy situations, we believe policy analysis must include a careful survey of how participants actually do things and why they do them one way rather than another.

Sometimes the terms "institution" and "organization" are used interchangeably. It is useful to draw a distinction between these two concepts. An organization can be thought of as a set of institutional arrangements and participants who have a common set of goals and purposes, and who must interact across multiple action situations at different levels of activity. Like institutions, organizations may be formally or informally constructed. Thus defined, the term organization includes, for example, legislatures, government agencies, multilateral organizations like the United Nations or the World Bank, nongovernmental organizations, colleges and universities, business enterprises, cooperatives, religious groups, clubs, social networks, clans, tribes, and families. Organizations are the product of human effort to order relations by removing uncertainty in repetitive interactions. All organizations (and many institutions) are formed subject to existing, higher-level institutions. For example, the organizational form of the US public corporation is prescribed by corpo-

rate and tax law. Corporate and tax law have been developed subject to the constraints of US constitutional law.

Another challenge for institutionally oriented policy analysis is complexity. Few policy situations are simple. Most involve knowledge from many different perspectives, activities are organized at multiple levels, and any given policy situation overlaps with other policy situations so that activities in one situation affect activities in another. No single discipline addresses all the issues that humans address when they interact in complex social situations. In order to understand what is actually going on in a policy area, as well as how things might proceed differently, it is important to incorporate input from multiple disciplines, multiple levels of activity, and multiple policy situations. One of the reasons for developing the IAD framework was to provide a common basis for integrating diverse policy elements and the work of diverse policy analysts.

A final challenge for policy analysts and designers is to avoid taking a "blueprint approach" (Korten 1980). When facing real policy imperatives, it is tempting to take a successful policy model as a kind of blueprint, and apply it broadly, designing new policies according to this blueprint. The problem with this approach is that the model or blueprint may not work in a different political-economic setting. In order to intelligently apply successful models, we must understand (1) the information and incentive structures inherent to the model, (2) the existing information and incentive structures in the policy situation in question, and (3) the fit between the model and policy setting. All policy situations are governed, for better or for ill, by institutional arrangements that are specific to the demands of a particular time, place, and people. These arrangements are deliberately crafted (or circumvented) by individuals and groups in order to make interaction more predictable by removing uncertainty and reducing risk. Policy reform that ignores an existing institutional context is doomed to failure.

In sum, institutions delimit capacity for social change. They are important precisely because they are intentional constructions that structure information and create incentives to act or not to act in a particular situation, thereby imposing constraints on the range of possible behavior and feasible reforms. Interacting with physical and cultural conditions, institutions create incentives for social behavior. This behavior generates observable patterns of interaction, which in turn produce policy outcomes. Hence, if we wish to evaluate, design, or reform policy, we must have a systematic way to analyze existing arrangements and to generate and compare alternatives. This brings us handily to a discussion of the IAD framework.

An Overview of the IAD Framework

The IAD framework is best viewed as a systematic method for organizing policy analysis activities that is compatible with a wide variety of more specialized analytic techniques used in the physical and social sciences. It does not replace other techniques, but provides a means to synthesize the work of multiple participants, including those who are directly involved in the policy situation and have an interest in policy outcomes. The IAD framework helps analysts comprehend complex social situations and break them down into manageable sets of practical activities. When applied rigorously to policy analysis and design, analysts and other interested participants have a better chance of avoiding the oversights and simplifications that lead to policy failures.

Figure 2.1 provides a schematic representation of the framework. After defining a policy question or problem, the focus of the analysis is on behavior in the action arena, which includes the action situation, and individuals and groups who are routinely involved in the situation (actors). One objective of the analysis is to identify factors in each of three areas that influence the behavior of individuals and groups in the policy situation: physical and material conditions, community attributes (culture), and rules-in-use. Two other objectives are to identify and evaluate patterns of interaction that are logically associated with behavior in the action arena, and outcomes from these interactions. This can be a very demanding task, even for very simple policy situations. However, more than twenty years of use by Workshop colleagues in all parts of the world investigating many different social questions, suggests that it is well worth the effort (see Applications section below).

Applying the IAD framework to policy analysis and design prompts us to think carefully about a wide assortment of issues that are important aspects of a particular policy problem. The more comprehensive and precise our analysis, the better hope we have of designing successful policy solutions. Many of these issues would be overlooked by technical analyses that consider a relatively narrow range of closely related factors. It also provides a means to incorporate diverse participants in policy analysis and design. Because the framework demands multiple disciplinary perspectives, it holds the potential to produce a very rich understanding of social situations. And in addition to providing the basis for more effective policy, this understanding can provide a firm foundation for building consensus for coordinated action. Now let us look at the process of institutional analysis using the IAD framework.
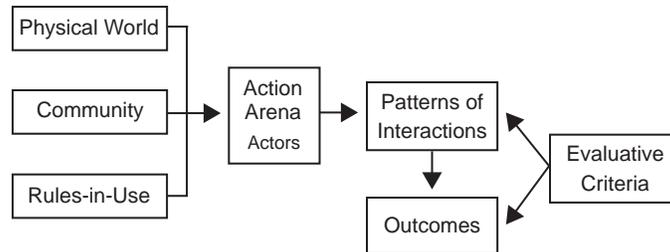
Figure 2.1. Institutional Analysis and Development framework.

Source: Adapted from Ostrom, Gardner, and Walker (1994, 37).

Using the IAD Framework for Policy Analysis and Design

Before we begin our analysis, we must first define a policy issue or objective as specifically as possible and decide how we will apply the IAD framework.

Step 1: Define the Policy Analysis Objective and the Analytic Approach

There are two ways to approach this task. The first approach involves using the framework as a diagnostic tool and working backwards through the flow diagram to reaffirm or revise policy objectives, evaluate policy outcomes, understand the information and incentive structure of a policy, or develop reform initiatives. This approach is best suited to analyzing well-established policy situations. We begin by isolating a specific policy issue or program, and specifying its objectives. We then observe some facts about outcomes of activity in the policy arena. The kinds of questions we ask include:

- What is happening in the policy arena?
- How do observed outcomes compare to policy objectives?
- Which outcomes are satisfactory? Which are not?
- Which outcomes are most important?

Focusing on a particular class of outcomes, we then identify relevant patterns of interaction. For example, key patterns of interaction in political-economic analyses typically include market structure, information flows, and the structure of political participation. Some questions we ask include:

- When are these outcomes occurring?
- Where are they occurring?
- Who is involved?

At this point, our backward-flowing diagnostic analysis leads us to specify the action arena, physical and material conditions, community attributes, and rules-in-use. We approach these analyses, which are described in more detail later in this section, by asking:

- How are policy outcomes occurring?

For example, imagine that we observe the following outcome of a publicly financed health care policy: costs have been increasing dramatically over the past five years and these costs are unsustainable given realistic assumptions about future public budgets. We would like to reform existing policy or create a complementary new policy that will balance the health care budget and still achieve other health care policy objectives. Focusing on the very general problem of rising costs, we narrow the analysis by making some further observations about patterns of interaction, asking which costs are rising most rapidly, when they are rising, and where they are rising. Data from this analysis leads to description of the policy action situation. We then deepen the analysis of the action situation by asking who is involved in generating rising costs; for example, who receives care, who makes decisions about giving care, who oversees health care service providers, and so on. Next, we ask detailed questions about how these costs are generated by investigating physical and material conditions, community conditions, and rules-in-use.

A second approach to defining a policy issue or objective and applying the IAD framework involves specifying a political-economic activity and then working forward rather than backward through the framework. So, for example, we might investigate infant health care. We would begin by describing the physical and material attributes of infant care, and proceed through community attributes, rules-in-use, a detailed analysis of the action arena, patterns of interaction, and outcomes. This approach is best suited to policy tasks that involve developing new policy initiatives, or comparing alternative policy designs. The same general questions used in a backward-flowing diagnostic analysis are useful in a prospective analysis.

In either approach, the analysis can be based on empirical observation of past and present events, hypothetical forecasts and simulations, or

a combination of both. Naturally, we recommend that policy analysts take care to maximize the validity and reliability of their analyses by using generally accepted investigation procedures. Although we have organized this chapter following the approach of working forward through the framework, we do not favor one approach over the other. In fact, we have both sometimes analyzed the components of the framework in idiosyncratic order, depending upon the particular analytic circumstances we were facing. Our advice is to analyze each component in the order that makes the most sense for a particular policy analysis project.

Step 2: Analyze Physical and Material Conditions

Physical and material conditions often influence policy action situations and constrain institutional arrangements in important ways. When we refer to physical and material conditions, we mean the physical and human resources and capabilities related to providing and producing goods and services. These conditions include production inputs like capital, labor, and technology, as well as sources of finance, storage, and distribution channels. It is important to specify these conditions because they have significant implications for policy design, politics, and collective action, which are all critical aspects of the policy-making process. The kinds of questions we ask to determine the physical and material conditions associated with a particular policy activity include:

- Focusing on the good or service produced in the policy situation, what is the economic nature of the activity?
- How is this good or service provided?
- How is this good or service produced?
- What physical and human resources are required to provide and produce this good or service? What technologies and processes are required? What are storage requirements, and distribution channels?
- What is the scale and scope of provision and production activity?

Following standard economic theory, the economic nature of a good or service can be determined by two attributes: (1) the extent to which access to consumption can be controlled (excludability) and (2) the extent to which one person's consumption reduces the supply available to others (subtractability). High subtractability implies individual consumption; low subtractability implies that more than one person will consume the

Table 2.1. Determining the economic nature of a good or service

	High excludability	Low excludability
High subtractability	*Private*	*Common Pool*
Low subtractability	*Toll*	*Public*

good or service at the same time. High excludability implies that consumers will have difficulty consuming the good or service without contributing to its cost; low excludability implies that consumers may be able to "free-ride," consuming the good or service without contributing to the cost of provision or production (Olson 1965). This classification scheme is summarized in the matrix in Table 2.1, which shows four broad categories of goods and services: private, toll, common pool, and public.

Consumption of goods and services is more or less subtractable or excludable depending upon the physical characteristics of a good or service, available production technology, the scale and scope of activity, and other aspects of the production system including storage and distribution. Private goods and services do not have a public character: consumption is perfectly excludable and subtractable. However, many other goods and services do have a public character. Consider, for example, various forms of physical infrastructure. Metered energy, water, telecom, sanitation, and arterial roads are often classified as toll goods. This is because while many people can use these goods or services at once, there are production processes, control systems, and distribution systems that make it possible to physically control consumption access so that consumers contribute to the cost of provision and production.[5] Conversely, isolated roads are an example of a public good; they can be used by many people at once and one person's use does not subtract from another's. However, use is not easily observable, so it is costly to exclude those who benefit from using these roads but do not contribute to their cost. When this is the case, there is little incentive for users to contribute to building and maintaining these roads, and hence it can be difficult to develop and sustain them. Consumption of common pool goods, like grazing lands, fisheries, and irrigation systems, poses yet another dilemma—one person's use reduces the supply available to others and it is difficult to physically control access. This combination of consumption and production characteristics means that these resources are easily destroyed, often to everyone's disadvantage.

Having identified the economic nature of the policy activity, we next differentiate production activities from provision activities. Production refers to all those activities that involve transforming inputs into outputs. Provision refers to activities associated with financing and distribution activities. For example, consider a policy to build and maintain a footpath between two villages through a remote grassland. The footpath is an example of a public good. It is costly to monitor and exclude others from using the path because it is in a remote area, so we say it has low excludability. It also has low subtractability: one person's use of the footpath does not diminish another person's use. In fact, the more people who use the path, the easier it is to maintain it. However, a public good presents a classic coordination dilemma. Every inhabitant of the area who has a reason to travel back and forth between the two villages benefits from a well-maintained path, yet it is difficult to act collectively to develop and sustain it. This problem can be exacerbated by the scale and scope of the activity: coordinating to provide and produce one relatively short path is easier than coordinating to provide and produce a very long path or multiple paths. So, absent some form of coordination to overcome the free-rider problem, it is unlikely that a footpath will be built and sustained without some form of intervention. This is where community attributes and rules come in to play, but we will defer these matters to subsequent sections.

Producing a footpath through a grassy area requires a scythe or some other piece of equipment to cut the grass, and competent labor to use the cutting equipment on the particular terrain. Providing a footpath involves noticing when it is time to cut the grass in order to properly maintain the path, making arrangements to cut the grass, and financing the cost. Production costs include the cost of purchasing and maintaining the cutting equipment, training and wages for the operator, and compensation for the opportunity cost of capital. Those who produce the footpath could also provide the footpath. For example, those who live in one village could form a cooperative association to provide and produce a footpath to the other village. Alternatively, the members of the village could provide the footpath, but hire someone in the neighboring village who has a sharp scythe to produce and maintain it. Or members of the two villages together could provide the footpath, hiring a private contractor who provides footpath services to a number of villages in the region to produce and maintain it.

As the foregoing example demonstrates, analyzing the economic nature of a policy activity and distinguishing between provision and production activities tells us quite a lot about which resources, capabilities,

and coordination mechanisms are required to effectively implement a policy. This example also suggests that there is not just one way but many different ways to organize these activities. Which way is the "best" way will depend upon a number of circumstances that are specific to a particular time, place, and people. The IAD framework thus compels us to consider community attributes.

Step 3: Analyze Community Attributes

The attributes of a community that affect a policy action situation include the demographic features of the community, generally accepted norms about policy activities, the degree of common understanding potential participants share about activities in the policy area, and the extent to which potential participants' values, beliefs, and preferences about policy-oriented strategies and outcomes are homogeneous. The kinds of questions we ask to determine the community attributes relevant to a policy action situation include:

- What knowledge and information do participants have about the relationship among policy-oriented strategies, actions, and outcomes?
- What are participants' values and preferences with respect to strategies for achieving outcomes, as well as outcomes themselves?
- What are participants' beliefs about the relationship among policy-oriented strategies, actions, and outcomes?
- What are participants' beliefs about other participants' strategy preferences and outcomes?

Investigating community and cultural attributes is notoriously difficult.[6] The validity and reliability of our conclusions are frequently controversial. Nevertheless, we believe it is imperative that policy analysts make an effort to understand the cultural context of policy activity as participants themselves understand it. The policy and development literatures are replete with examples of well-intended policy failures that were inconsistent with cultural norms and routines. If these kinds of inconsistencies can be discovered after the fact, it seems to us that they are potentially discoverable before policies are initiated if we carefully integrate sociological, anthropological, or social-psychological studies in the policy analysis process. Consider, for example, the complex set of community attributes that affect US business policy. Business educators aim to create a consistent

business ethos to enhance business performance. They promote a shared understanding (norms, values, beliefs, preferences) among business professionals that management's first obligation is to maximize the market value of the company, subject to constraints imposed by its rather diverse constituency.[7] The performance measures used by the financial community to evaluate and compare business performance reflect and reinforce this ethos. These standards include revenue and earnings growth (overall, and within strategic business segments), control of operating expense, debt to equity ratios, return on investment, and whether current stock price overstates or understates fundamental business value.

While the norm of maximizing business market value appears to be widely shared by business academics, the business press, and professionally trained business people, a 1996 Yankelovich Partners poll shows that 51 percent of Americans think a business firm's first obligation is to its employees, and only 17 percent think shareholders deserve highest priority (Rosewicz 1996). Considering that most Americans are employed by business and better than 50 percent of all Americans currently own stock in business corporations, this contradiction has very interesting implications for policy that affects business incentives to balance competing demands by employees and stockholders. A policy analysis that fails to consider these different community attributes will be considerably weaker than one that is more complete.

Step 4: Analyze Rules-in-Use

The types of rules the IAD framework asks us to consider in an institutional analysis are closely linked to the elements of an action situation. They are the minimal but necessary set of rules that are needed to explain policy-related actions, interactions, and outcomes. As we will see in a subsequent section, the types of rules we consider correspond with the clusters of elements we analyze in the policy action situation (Figure 2.2). This makes sense when we recall that the focus of institutional analysis is on understanding the formal and informal rules that affect behavior in the action arena.

When we analyze rules-in-use in the action arena, we concentrate on the operating rules that are commonly used by most participants and on the sources of these rules, rather than on rules that can be articulated but are not widely observed. Taking a representative sample of the population engaged in the policy activity in question, we want to know what these

PHYSICAL WORLD

COMMUNITY ⟶ **ACTION ARENA**

RULES-IN-USE

	Action Situation	Actors
1. Position ⟶	Positions ⟶	Resources
2. Boundary ⟶	Participants ⟶	Valuations
3. Authority ⟶	Actions & Linkages	Information Processing
4. Aggregation ⟶	Control	Selection Processes
5. Scope ⟶	Outcomes	
6. Information ⟶	Information	
7. Payoff ⟶	Costs & Benefits	
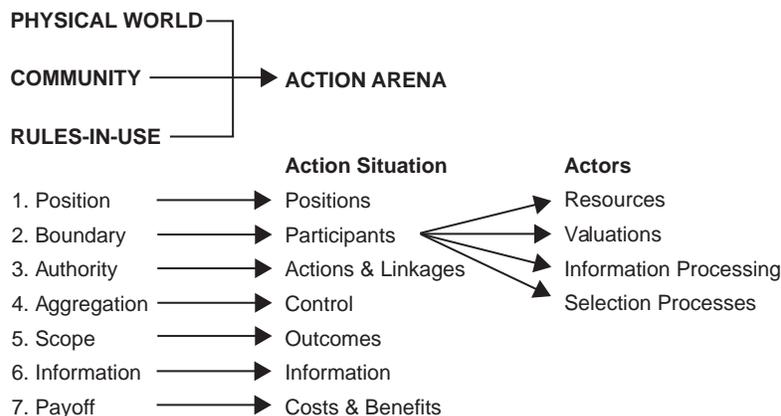
Figure 2.2. Relationship between rules-in-use and elements of the policy action arena.

rules are, the source of each of the rules, who observes them and why, and who does not observe them and why.[8] The seven types of rules we consider are: (1) position, (2) boundary, (3) authority, (4) aggregation, (5) scope, (6) information, and (7) payoff.

We have previously observed that rules are abstract phenomena. Let us look at a cursory example of an IAD analysis to illustrate how we analyze rules-in-use. Table 2.2 presents a contrived (and quite exaggerated) analysis of traffic policy in two types of metropolitan intersections, based on one of the author's subjective experience.

Position rules specify the set of positions or roles that participants assume in an action situation, and the number and type of participants who hold each position. In our example, we have drivers, pedestrians, a voluntary association (American Automobile Association), and traffic control officials. *Boundary rules* can be thought of as exit and entry rules: they specify which participants enter or leave positions and how they do so, for example, rules related to licensing drivers or becoming employed as a traffic control official. *Authority rules* specify the actions participants in given positions may take, such as the set of rules that governs what a traffic control officer may do when s/he stops a driver, or when one driver collides with another. *Aggregation rules* determine how decisions are made in an action situation. For example, a driver entering an intersection controlled by a traffic signal decides whether or not to proceed into the intersection based upon the color of the traffic light. *Scope rules* specify the jurisdic-

Table 2.2. IAD analysis of traffic policy in two types of metropolitan intersections

IAD domain	Minneapolis	Boston
Physical world	Four-way square intersection. Severe winter weather. Well-marked streets. Few potholes. Heavy traffic.	Four-way traffic circle. Moderate snow, ice, and rain. Poorly marked streets. Many potholes. Congested traffic.
Community	Homogeneous Communitarian	Heterogeneous Individualistic
Rules-in-use	Pedestrian has right-of-way. Otherwise, driver in intersection has right-of-way. No traffic signal. Drivers enter intersection when there is no one waiting in an opposing lane. Traffic control is a low priority for metro police. AAA campaign to encourage polite driving habits.	No pedestrians. Driver in outer lane of traffic circle has right-of-way. No traffic signal. Drivers simultaneously and continuously enter and exit traffic circle using all available lanes possible. Traffic control is a low priority for metro police. No AAA campaign.
Action arena	—	—
Patterns of interaction	Sequential queuing.	Chaotic queuing.
Outcomes	Average time through intersection, collisions, property damage, and so forth	

tion of outcomes that can be affected and whether these outcomes are or are not final. Traffic policy can cover all traffic intersections in a state, or it can apply to a more limited class of intersections. Similarly, a traffic control officer's citation can be made subject to appeal in traffic court. *Information rules* affect the amount and type of information available to participants in an action arena. For example, a rule that makes information about enforcement of traffic laws in an intersection available to drivers
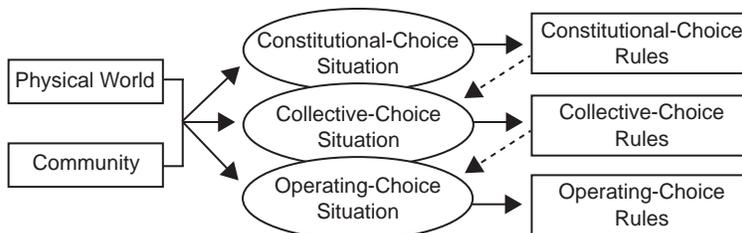
Figure 2.3. Rules and policy systems.

who routinely use the intersection could affect the way drivers behave. And last, but not least, *payoff rules* determine how costs and benefits are meted-out in the action arena. In our example, insurance rules, licensing rules, and traffic codes determine who bears the cost of driving violations in a traffic intersection and hence, the benefits of complying with different types of rules in the action situation.

We have briefly described and illustrated how we would use the IAD framework to analyze rules-in-use in a relatively simple policy action situation. But many policy questions involve complex systems of interaction. In these cases, we court policy failure if we limit analysis to single action arenas. While we cannot hope to fully develop a systemic institutional analysis in such a short exposition, we can briefly consider how the IAD guides us to approach it.

Analyzing Policy Systems

In addition to delving deeply into the factors that affect single action arenas, the IAD framework helps an analyst to organize and explain behavior in policy systems. Most policy situations are composed of multiple distinct but overlapping action arenas that are linked sequentially or simultaneously, and several levels of rules. Figure 2.3 depicts this complexity. For example, the system of banking regulation that has evolved over two centuries in the United States uses ten competing federal agencies, fifty state banking commissions, and fifty state insurance commissions to regulate ten different types of financial service enterprises operating in twenty regulation-defined markets related to borrowing, transactions management, and savings. Banks, consumers, and regulators use myriad competitive and cooperative strategies in policy action situations, including participating in financial services markets, organizing to take collective action, lobbying for private action, lobbying for legislative action, lobbying for executive action, lobbying for regulatory action, monitoring and enforcing regula-

tion, legislating, and taking legal action. In order to understand banking policy, an analyst must link activity in many different action arenas, and consider rules at operating, collective choice, and constitutional levels.

It is not always easy to identify relevant action arenas in large, complex policy systems. Continuing with our example of US banking policy, depending upon the policy question, one might need to analyze scores of action arenas involving banking, insurance, and investment brokerage firms, credit unions, the market for financial services, trade associations, public interest organizations, presidential commissions, interstate governmental commissions, several departments of the US Treasury, the Board of Governors of the Federal Reserve, the Department of Justice, the Federal Deposit Insurance Corporation, state banking commissions, state legislatures and legislative committees, federal legislatures and legislative committees, state and federal courts, the Supreme Court, and the Bank for International Settlements. The key is to continually narrow the policy question as much as possible. In systemic analyses, this winnowing process occurs as the analysis progresses. What we generally find is that the most relevant arenas readily emerge from a rigorous application of the IAD framework.

Analyzing Multiple Levels of Rules

Rules are frequently nested in other sets of rules that define how lower-level rules function. Whenever we address questions about policy change, we must distinguish three levels of rules that cumulatively affect the actions taken and outcomes obtained in any policy situation (Kiser and Ostrom 1982). The first level is the operating level. Operating rules affect participants' day-to-day decision making in specific political and economic settings. The second level is the collective-choice level. Collective-choice rules determine who is eligible to participate in activity affecting the operating level, and how operating rules may be changed. Similarly, constitutional rules determine who is eligible to participate in crafting collective-choice rules, and how these rules may be changed. At each level of analysis there can be one or more arenas in which different types of decisions made at that level will occur. The linkages among these rules and action arenas are diagramed in Figure 2.4.

Once again, we will use banking regulation to illustrate. Consider the levels of rules pertaining to the policy action situation in which banks operate branches in any state in the United States. In this example, the operating activity is branching across state lines. Until fairly recently, US banks were not permitted to make this decision. They could collect and analyze infor-
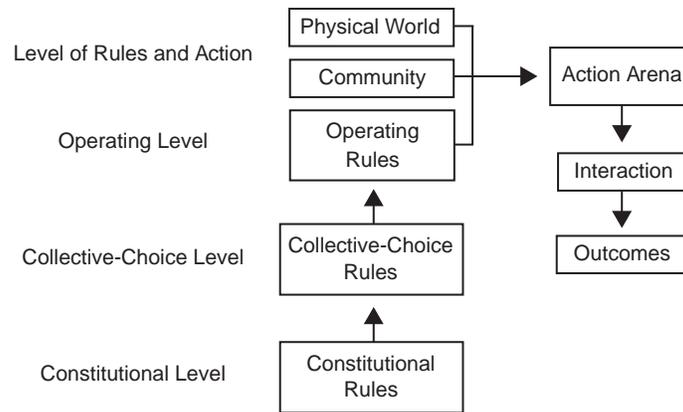
Figure 2.4. The linkages among levels of rules and IAD components.

mation about the possible effects of nationwide banking, formulate a corporate position, meet with other bank officials to strategize about change, and hire legislative lobbyists, but they could not legally branch throughout the United States. This was so because collective-choice rules specified that only state legislatures (who make the rules for state-chartered banks) and federal legislatures (who make the rules for nationally chartered banks) could decide whether banks could branch across state lines. Until passage of the Interstate Banking and Branching Efficiency Act of 1994, federal banking law deferred to the states on interstate branching. Hence, state and nationally chartered banks could only branch across state lines if states adopted permissive legislation. Under US constitutional rules, states cannot make rules on behalf of other states. But the US Congress can impose rules on the states, providing the rules do not violate states' constitutionally guaranteed rights. And so to understand policy change in this action situation, an analyst must consider the effects of rules at all three levels: operational, collective choice, and constitutional.

Step 5: Integrate the Analysis

As we previously indicated, the action arena is the focus of policy analysis and design—it is where the policy action is! The action arena is a conceptual space in which actors inform themselves, consider alternative courses of action, make decisions, take action, and experience the consequences of

these actions. Who is present in this situation, the roles they play, the actions they take, and so on, are all affected by factors in the physical and material world, the community, and rules-in-use. The action arena has two aspects: the action situation, and the actors who interact in the action situation.

Action Situation

We integrate an IAD policy analysis by explaining behavior in terms of the following situational elements:

- What are the *positions* or roles that actors play in this situation?
- Who are the *participants*?
- What *actions* can participants take, and *how are actions linked to outcomes*?
- What is the level of *control* that each participant has over action in this situation?
- What *outcomes* are possible in this situation?
- What *information* about the action situation is available to participants?
- What *costs and benefits* do participants incur when they take action in this situation?

For example, when analyzing overharvesting from a common-pool resource (CPR), we need to know how physical and material conditions, community attributes, and rules encourage or discourage who and how many individuals use the resource system; what roles they play when they use it; what geographic region and which events in that region are affected by users' resource consumption; which types of harvesting processes and technologies are used; whether there are conservation measures such as open and closed seasons; whether users withdraw resources on their own initiative, confer with others, or obtain a permit; how much information users have about the condition of the resource and how their use and other users' use affects the resource; and what costs or benefits users incur if they overharvest. Recall that the economic nature of a CPR creates incentives for users to free-ride on the efforts of others to sustain the resource, which can lead to degradation (see Table 2.1). A growing body of empirical and theoretical research suggests that the likelihood of this occurring depends critically upon the fit among the physical and material conditions associated with providing and producing the resource, community attributes, and institutional arrangements. This work suggests that using the IAD framework to guide CPR policy analysis and design is a very sensible thing to do.[9]

Actors

In the IAD approach, it is very important to rigorously analyze the decision-making capabilities of actors in action arenas. This is accomplished by considering the following:

- Resources
- Valuations
- Information Processing
- Selection Processes

Actors' decision choices are often influenced by access to stocks of capital, labor, knowledge, technology, time, and social influence. These resources endow actors with the capacity to act unilaterally, bilaterally, or multilaterally, over short, medium, and long time horizons. This capacity fundamentally determines the relative strength of one actor or group of actors. The extent to which relative strength may be exercised to circumvent or change existing rules is itself a function of higher order institutional arrangements.

Valuations or preferences refer to what it is that an actor wishes to achieve in a given situation. Human values and preferences are the subject of considerable theoretical work in psychology, economics, and philosophy. An institutional analyst must either estimate from survey measurements or make intelligent assumptions about preferences in order to construct a model of decision behavior in the action arena.

We have already noted that decision making is affected by the quantity and quality of participants' information. Information processing, the processes used to incorporate information to make decisions about actions, is another element of this analysis. Consciously or unconsciously, we often assume that participants in a given policy situation are perfectly informed (or will take the trouble to become so), and that they use rational decision-making processes.[10] Many policy professionals are trained to assume that policy situations can be analyzed as constrained optimization problems. This sort of analysis often assumes that diverse participants have the same information, face no uncertainty, and can costlessly overcome innate individual differences, formulate mutually acceptable valuations, and assign probabilities for all inputs to the decision process. Further, that they can quickly and accurately make these calculations.

Most policy analysts recognize that these conditions are rarely met in the naturally occurring world, that strictly rational optimization will not occur, and that policy designs based on these assumptions will fail. In most

policy settings, participants have differing amounts of information, endowments, experience, and processing capabilities. Uncertainty is rampant and preferences are often radically opposed. Search and negotiation impose substantial costs on coordination, problem solving, and decision making. These conditions mean that social behavior will have a strategic character as self-interested individuals square-off with those who have broader social objectives. While we believe that policies can and ought to be designed to encourage reconciliation of individual and group interests, as well as rational decision making, some policy situations are more conducive to this type of information processing than others. Hence, it is critical that policy analysts assess the capacity of participants to overcome those factors that contribute to opportunistic behavior in particular policy situations.

Finally, the selection criteria actors use to order and evaluate one action alternative with respect to another, is a related consideration. Again, one must consider the extent to which individual and group decision making is rational. And rationality is affected by a variety of sociopsychological factors including the availability of information, education levels, personality differences, nutrition, peer pressure, and so on. Selection criteria are particularly sensitive to the vagaries of the physical and material world, community attributes, and existing rules-in-use.

Step 6: Analyze Patterns of Interaction

Once the constraints of the physical and material world, community attributes, and rules-in-use are taken into consideration, patterns of interaction flow logically from the behavior of actors in the action arena. Patterns of interaction refer to the structural characteristics of an action situation and the conduct of participants in the resulting structure. In tightly constrained policy action situations with little or no uncertainty, participants have a limited range of strategies, and a policy analyst can make strong inferences and specific predictions about likely patterns of behavior. For example, when there is no limit on the number of people who use a common-pool resource, or the amount of harvesting activities they can undertake, and users do not have access to arenas in which to negotiate common resource management rules, we can safely predict that users will overharvest the resource and fully dissipate economic surplus (E. Ostrom, Gardner, and Walker 1994). Similarly, if bankers face intense competitive pressure, taxpayers guarantee deposits, and regulators relax supervision, we can expect to find an increase in the riskiness of bank lending (Polski 1996).

Unfortunately, most policy analysis situations do not generate such unambiguous patterns of interaction. Rather than make completely independent decisions, individuals may make their decisions within the context of community norms that dramatically change the structure of the situation. Or, they may meet with other stakeholders in the situation to solve problems. In the process, they may implement production innovations, or design new institutions and organizations. In these situations, participants often have a broader range of strategies. Further, these strategies can change over time as participants learn about the results of past actions. When examining these more open, less constrained situations, a policy analyst is forced to make weaker inferences about patterns of interaction. However, well-informed weak inferences can still provide important policy information. At times, it is possible to predict patterns that will not emerge. Narrowing the range of predictions is very helpful in policy design.

Step 7: Analyze Outcomes

Just as patterns of interaction flow logically from a rigorous IAD analysis, insight about outcomes flows logically from similarly well-founded observations about patterns of interaction. When we analyze outcomes, we are really analyzing the performance of a policy system. Hence, we need some kind of objective standard or principle for comparison. Sometimes, programs or policies provide these baselines. But in many cases, we must specify evaluative criteria as part of the policy analysis process. While there are many potential candidates, we briefly focus on six common concerns in political-economic analysis: economic efficiency, fiscal equivalence, redistributional equity, accountability, conformance to general morality, and adaptability.

Policy design must frequently consider how alternative policies affect participants' incentives to produce efficiently. An outcome is technically efficient if the marginal cost of producing a unit of output is equal to the price. From a social welfare perspective, an outcome is allocatively efficient if the marginal social benefit equals the marginal social cost. In a dynamic analysis, an outcome is efficient if the discounted present value of net benefits is maximized. A less strict but often acceptable efficiency standard is cost effectiveness—producing a good or service at the lowest possible cost. However, many policy issues do not lend themselves to strict economic evaluation because there are no readily observable market

prices for some social goods or services, or because inputs to the production process cannot be precisely valued.

The concept of fiscal equivalence is one means to evaluate the equity of policy outcomes. Fiscal equivalence or proportionality means that those who benefit from a good or service bear the cost of providing it in equal measure to benefits received from it. Following this principle, those who derive greater benefits pay more than those who derive fewer benefits. Because perceptions about fiscal equivalence can affect consumers' willingness to contribute to developing and sustaining a policy initiative, there must be some way to estimate the value of costs and benefits that is acceptable to this group in order to implement fiscal equivalence as an evaluation device.

Another principle for evaluating the equity of policy outcomes is distributional equity. According to this principle, individuals contribute toward the cost of goods and services based upon their ability to pay for them. Depending upon the distribution of income in a society, progressive equity schemes may directly conflict with those based on the principle of fiscal equivalence. As with fiscal equivalence, evaluating outcomes on the basis of the principle of distributional equity requires the ability to convincingly estimate the value of costs and benefits.

Another common policy performance criteria is accountability. The key questions here are (1) the extent to which the policy context facilitates low-cost information sharing or transparency, (2) the relative capacity or skill of participants to evaluate the actions of others in the policy situation, and (3) the extent to which participants have ready access to mechanisms that permit them to monitor and sanction one another. If there are imbalances in any of these areas, accountability will be impaired. And without accountability, there is no check on opportunistic behavior.

In addition to accountability, one might also evaluate the extent to which the policy context fosters conformance to general morality.[11] Can participants harm each other and go undetected? If they do, do they obtain high payoffs? Are those who fail to conform to the rules or honor their commitments penalized? Can people trust each other to play by the rules?

Finally, one might wish to consider the extent to which the policy context encourages sustainability through innovation and adaptation in response to change. Sometimes existing policies impose rigidities. This is of course the basis for arguing against quota systems and other forms of tariffs and subsidies. In a more general sense, institutional systems based on general principles are often thought to permit greater adaptation

than strictly codified institutional systems. Similarly, policy situations subject to greater local control might permit greater adaptation in some sets of circumstances.

Summary

We know this has been a rather quick tour of a complex analytic process. It may even seem a bit overwhelming. However, we can assure you that the IAD framework makes policy analysis and design easier, not more difficult. Followed rigorously, the end product will be comprehensible to a wide audience. Further, it can be used by a policy manager to design an inclusive and participatory policy analysis process. Following is a summary of the steps involved in conducting a policy analysis based on the IAD framework.

1. Define the policy analysis objective and specify the analytic approach

   What is happening in the policy arena?
   How do observed outcomes compare to policy objectives?
   Which outcomes are satisfactory? Which are not?
   Which outcomes are most important?
   When are these outcomes occurring?
   Where are they occurring?
   Who is involved?
   How are policy outcomes occurring?

2. Analyze physical and material conditions

   What is the economic nature of the policy activity?
   How is this good or service provided?
   How is it produced?
   What physical and human resources are required? What technologies and processes?
   What are storage requirements and distribution channels?
   What is the scale and scope of provision and production activity?

3. Analyze community attributes

   What is the size of the community and who is in it?
   What knowledge and information do members have?

What are members' values and preferences?
What are members' beliefs?
What are members' beliefs about other participants' strategy preferences and outcomes?
How homogeneous is the community?

4. Analyze rules-in-use

Position
Boundary
Authority
Aggregation
Scope
Information
Payoff

5. Integrate the analysis

Action Situation

What are the *positions* or roles that actors play in this situation?
Who are the *participants*?
What *actions* can participants take, and *how are actions linked to outcomes*?
What is the level of *control* that each participant has over action in this situation?
What *outcomes* are possible in this situation?
What *information* about the action situation is available to participants?
What *costs and benefits* do participants incur when they take action in this situation?

Actors

Resources
Valuations
Information Processing
Selection Processes

6. Analyze patterns of interaction

Structure of economic and political participation
Information flows

7. Analyze outcomes

> Efficiency
> Fiscal Equivalence
> Distributional Equity
> Accountability
> Conformance to General Morality
> Sustainability/Adaptability

Applications

In the early 1970s, when the IAD framework was first being developed, Workshop research colleagues were trying to understand how the diverse paradigms in political science affected the way we thought about public administration and metropolitan organization (see V. Ostrom and E. Ostrom 1971; E. Ostrom 1972; E. Ostrom and V. Ostrom 1986). Then, for a decade and a half, the framework was used as a foundation to conduct an extensive number of empirical studies of police service delivery in metropolitan areas (see E. Ostrom and Whitaker 1973; E. Ostrom, Parks, and Whitaker 1973, 1978; Parks and Ostrom 1981; Parks 1984, 1985; E. Ostrom 1975, 1985b; McIver 1978; McDavid 1974). During the past decade, the IAD framework has been used to analyze common-pool resources (see, e.g., E. Ostrom, Gardner, and Walker 1994), among many other policy issues.

In designing empirical studies using the IAD framework, a key question has always been the appropriate units and levels of analysis for any particular type of question (see Gregg 1974). For example, when Ostrom and Parks studied police services, the police department was only one of the units of analysis included in this work. Instead, they tried to understand who the actors were in diverse service situations such as immediate response services, homicide investigation, laboratory analysis, training, and communication services. They found different sets of actors involved in each of the service situations. In some, citizens as well as police officers as street-level bureaucrats were key participants. In others, they found participants from many different urban service agencies. They had to examine interorganizational arrangements to understand patterns of interaction and results. Using this perspective, they found highly structured patterns of relationships where others had found only chaos. The highest levels of police performance existed, for example, in those

metropolitan areas where small-scale, immediate-response units worked along with large-scale investigatory, laboratory, and communication units (Parks 1985). Ongoing research by Parks in the Indianapolis area is providing strong evidence that many of the patterns observed in the 1970s and 1980s are still in evidence in the 1990s. In light of this extensive empirical research, we have a far better understanding of the patterns of metropolitan organization and local government (ACIR 1987, 1988; V. Ostrom, Bish, and E. Ostrom 1988; Oakerson and Parks 1988; Parks and Oakerson 1989; Stein 1990).

The second broad area in which the IAD framework has been extensively applied is the study of common-pool resources. In 1985, the National Academy of Sciences (NAS) organized a research panel on the study of common property (National Research Council 1985). Ronald Oakerson (1992) wrote a framework paper for the panel that was used in the organization of a series of case studies of how diverse peoples had devised institutional arrangements related to common-pool resources (see also Edwards and Steins 1998; Thomson, Feeny, and Oakerson 1992; E. Ostrom 1992a, 1992b). Oakerson's presentation of the framework has influenced an untold number of studies of common-property regimes in many diverse sectors in all regions of the world. A revised publication from this conference (Bromley et al. 1992) contains several case studies based on the framework. The intellectual productivity stimulated by the work of the NAS panel has led to the formation of an International Association for the Study of Common Property (IASCP). More than five hundred scholars attended the 1998 meeting of the association held in Vancouver, British Columbia, in June.

The IAD framework has now been used to develop three major databases related to the study of common-pool resources and diverse property regimes. The first "CPR Database" drew on the cases produced for the NAS panel and on the extremely large number of individual case studies that we discovered had been written by historians, sociologists, engineers, political scientists, anthropologists, and students of environmental science (Hess 1999).[12] We used the IAD framework overtly to create a structured database for appropriation and collective-choice arenas. Schlager (1990, 1994) and Tang (1991) studied approximately fifty inshore fisheries and irrigation systems, respectively, and were able to isolate key rules that were positively associated with higher performance levels. In *Governing the Commons*, Ostrom (1990) was able to draw on the framework and on an analysis of extensive case studies to examine the design principles that characterized robust, self-organized institutions for achieving sustainable resource use over very long periods of time.

A second database focuses entirely on irrigation systems and has been used to code more than 175 irrigation systems in Nepal (Benjamin et al. 1994). That database has enabled Workshop colleagues to test many theoretical propositions that have long influenced policy analysis and design (see Lam 1998; Schweik, Adhikari, and Pandit 1997; Lam, Lee, and Ostrom 1997; E. Ostrom 1994, 1996a; E. Ostrom, Lam, and Lee 1994; E. Ostrom and Gardner 1993). These studies challenged many of the empirical assumptions used by development specialists who have presumed that farmers are unable to self-organize and engage in costly collective action without the imposition of rules from external authorities (see also Thomson 1992). One study found that farmer-managed irrigation systems in Nepal are able to outperform agency-managed systems in regard to agricultural productivity when we have controlled for factors such as size of group, length of canal, and type of terrain (Lam 1998).

The third database is an integral part of the International Forestry Resources and Institutions (IFRI) research program, which is a major ongoing research program of the Workshop in Political Theory and Policy Analysis at Indiana University, and of the recently established Center for the Study of Institutions, Population, and Environmental Change (CIPEC). This program is designed to address knowledge and information gaps about how institutions affect the incentives of forest users and result in substantial levels of deforestation in some locations while forest conditions are improving in other locations. Six collaborative research centers have now been established in Bolivia, Ecuador, India, Kenya, Nepal, and Tanzania, Uganda, and several more will be established in future years (E. Ostrom and Wertime 1994; Jerrells and Ostrom 1995). In Uganda, Banana and Gombya-Ssembajjwe (2000) have shown in their initial studies that the only forests where deforestation is not extensive are where local institutional arrangements are viewed by local residents as legitimate and are monitored extensively. In their study of a *comuna* in Ecuador, Gibson and Becker (2000) have documented the importance of distance from a forest as it affects the costs that villagers would have to pay to actively monitor and enforce rules even when they have full authority to make and enforce their own rules. In India, Agrawal (2000) provides an empirical challenge to the presumption of many specialists that collective action becomes progressively more difficult as the size of the group increases from a very small face-to-face group. He shows that moderately sized villages are better able to generate the labor needed to protect local forests than are very small villages. Schweik (2000) has examined the geographic distribution of *Shorea robusta*, a highly valued

species. He found that neither population density of the villages adjacent to the three forests he studied in Nepal nor predictions from optimal foraging theory adequately predict the spatial distribution of the species. The most robust explanation for the distribution of this species relates to the institutional rules that allow higher-caste villagers to access their "own" forests as well as forests located near villages where lower-caste villagers live but not vice versa.

In addition to these research programs, the IAD framework has also influenced a variety of other studies including those developing models of social-choice situations and then subjecting them to empirical tests in experimental laboratories (Herzberg 1986; Wilson and Herzberg 1987; Herzberg and Wilson 1988; Herzberg and Ostrom 1991). Other policy questions include rural infrastructure in developing countries (E. Ostrom, Schroeder, and Wynne 1993; Gerrard and Polski 1998a, 1998b); privatization processes (Walker 1994a, 1994b); development processes more generally (V. Ostrom, Feeny, and Picht 1993; Thomson 1992; Wunsch and Olowu 1995); constitutional dynamics in the American federal system (Jillson and Wilson 1994; V. Ostrom 1994, [1971] 1987) as well as in the Canadian federal system (Sproule-Jones 1993); linking local and global commons (McGinnis and Ostrom 1996; Keohane and Ostrom 1995); the East Asian financial crisis (Polski 1998); and banking runs and panics (Polski 1996). In addition, the IAD framework has influenced the analysis of a wide range of issues related to how institutions are organized for the provision and production of education, microcredit facilities, day care, primary health, fertilizer, and coffee. Empirical work has been carried on in Bangladesh, Bolivia, Brazil, Cameroon, Canada, China, Costa Rica, Ecuador, Ghana, Guatemala, Hong Kong, India, Indonesia, Ivory Coast, Liberia, Madagascar, Mali, Nepal, Nigeria, Norway, Poland, Russia, Sweden, Taiwan, Uganda, and the United States.

In closing, we summarize the general categories of policy analysis that Workshop colleagues have undertaken using the IAD framework:

1. Economic development issues including infrastructure, privatization, fiscal policy, credit allocation, health and human services, and resource management
2. Common-pool resource management including forests, fisheries, irrigation, water resources, and grazing
3. Local and metropolitan public services and governance
4. State/Regional/Provincial public services and governance
5. Federal public services and governance

6. Constitutional design
7. International relations

Further information, bibliographies, and research assistance are available on the Workshop website (https://ostromworkshop.indiana.edu).

Acknowledgments

Notes

This chapter was originally a 1999 unpublished working paper from the Workshop in Political Theory and Policy Analysis at Indiana University. Figure 2.1 reprinted with the permission of the University of Michigan Press.

1. For discussions of the IAD framework as a tool for research and theoretical development, see, for example, Kiser and Ostrom (1982); Oakerson (1992); E. Ostrom (1985a, 1986, 1991, 1996a, 1996b); E. Ostrom, Gardner, and Walker (1994); and V. Ostrom, Feeny, and Picht (1993). Oakerson (1992) and Oakerson and Walker (1997) discuss the IAD framework as a policy analysis tool for common property and development policy issues.

2. For a survey of the early public choice literature on institutions, see E. Ostrom (1986).

3. For example, the 1997 World Annual Development Report (World Bank 1997) provides a comprehensive discussion of this change. An institutional approach has also provided the foundation for two recent international policy workshops sponsored by the World Bank: one on developing sustainable rural infrastructure (May 1997), and another on community participation in natural resource management (May 1998).

4. For summaries of the evidence, see E. Ostrom (1998b).

5. We note that providing and producing metered utilities requires a certain minimum scale, adequate investment capital, and particular sets of institutional arrangements to be politically and economically viable. It is widely believed that these conditions are not met in developing countries. However, a growing body of research and practical experience suggests that participatory institutional arrangements can provide a foundation for coordinating to meet these conditions where they might not otherwise be met. For experience pertaining to rural infrastructure, see Gerrard and Polski (1998a). Also see E. Ostrom (1990) on self-governed

common-pool resources, and E. Ostrom, Schroeder, and Wynne (1993) on infrastructure policies.

6. Thomson and Freudenberger (1997) provide a useful description of key community attributes, which includes historical factors such as population and settlement history and conflict history; social factors such as ethnicity and language, family structure, caste and other social divisions; economic factors such as livelihood strategies and stratification; and cultural beliefs.

7. In addition to stockholders, constituents include customers, suppliers, employees, other firms in the same industry, local, state, and federal government, and other members of the community who are affected by business actions.

8. Analyzing both compliance and noncompliance helps us to better understand the incentive structure in the action arena.

9. For a review of the CPR literature in the context of the IAD framework, see E. Ostrom (1996a).

10. Strict rationality implies perfect and complete information as well as the ability to accurately process this information in a logically consistent way. Weaker assumptions about information and information processing (bounded rationality) relax the restrictions of strict rationality.

11. We freely admit that specifying "general morality" is a slippery slope. Nevertheless, we are encouraged by empirical evidence that suggests that people in many different types of policy settings relentlessly struggle to develop and enforce generally acceptable moral standards.

12. Hess (1999) is a searchable and browsable bibliography on CD-ROM containing more than 22,500 citations on the multidisciplinary study of jointly owned or managed natural and man-made resources, from forests, fisheries, and irrigation systems to urban playgrounds, transportation systems, and the Internet. The references to this international literature include both theoretical works and case studies.

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