ferred to whenever someone new (such as a new employee or a child) is being socialized into an existing rule-ordered system of behavior. They are the dos and don'ts that one learns on the ground that may not exist in any written document. In some instances, they may actually be contrary to the dos and don'ts that are written in formal documents. Being armed with a set of questions concerning how X is done here and why Y is not done here is a very useful way of identifying rules-in-use, shared norms, and operational strategies.

**Multiple Disciplines—Multiple Languages**

Because regularized human behavior occurs within a wide diversity of rule-ordered situations that share structural features such as markets, hierarchies or firms, families, voluntary associations, national governments, and international regimes, there is no single discipline that addresses all questions important to the study of human institutions. Understanding the kinds of strategies and heuristics that humans adopt in diverse situations is enhanced by the study of anthropology, economics, game theory, history, law, philosophy, political science, psychology, public administration, and sociology. Scholars within these disciplines learn separate technical languages. Meaningful communication across the social sciences can be extremely difficult to achieve. When social scientists need to work with biologists and/or physical scientists, communication problems are even more difficult. One of the reasons for developing the IAD framework has been, therefore, to develop a common set of linguistic elements that can be used to analyze a wide diversity of problems.

**Multiple Levels of Analysis**

When individuals interact in repetitive settings, they may be in operational situations that directly affect the world, or they may be making decisions at other levels of analysis that eventually impinge on operational decisionmaking situations (Shepsle, 1989). Multiple sources of structure are located at diverse analytical levels as well as diverse geographic domains. Biologists took several centuries to learn how to separate the diverse kinds of relevant structures needed to analyze both communities and individual biological entities. Separating phenotypical structure from genotypical structure was part of the major Darwinian breakthrough that allowed biologists to achieve real momentum and cumulation during the past century. The nested structure of rules within rules, within still further rules, is a particularly difficult analytical problem to solve for those interested in the study of institutions. Studies conducted at a macro level (see Kaminiski, 1992; V. Ostrom, 1997; Loveman, 1993; Sawyer, 1992) focus on constitutional structures. These, in turn, affect the type of collective-choice decisions as they eventually impinge on the day-to-day decisions of citizens and/or subjects. Studies conducted at a micro level (Firm-in-Sellers, 1996; E. Ostrom, Gardner, and Walker, 1994) focus more on operational-level decisions as they are in turn affected by collective-choice and constitutional-choice rules, some, but not all, of which are under the control of those making operational decisions. Finding ways to communicate across these levels is a key challenge for all institutional theorists.

**Configural Relationships**

Successful analysis can cumulate rapidly when scholars have been able to analyze a problem by separating it into component parts that are analyzed independently and then recombining these parts additively. Many puzzles of interest to social scientists can be torn apart and recombined. Frequently, however, the impact on incentives and behavior of one type of rule is not independent of the configuration of other rules. Thus, the impact of changing one of the current rules that is part of a state "welfare system" depends on which other rules are also in effect. Changing the minimum outside income that one can earn before losing benefits from one program, for example, cannot be analyzed independently of the effect of income on benefits derived from other programs. Similarly, analyzing the impact of changing the proportion of individuals who must agree prior to making an authoritative collective choice (e.g., 50 percent plus one) depends on the quorum rule in force. If a quorum rule specifying a low proportion of members is in effect, requiring two-thirds agreement may be a less stringent decision rule than a simple majority rule combined with a quorum rule requiring a high proportion of members. Ceteris paribus conditions are always essential for doing any theoretical work involving institutions. In the case of institutional analysis, one needs to know the value of other variables rather than simply asserting that they are held constant. This configural nature of rules makes institutional analysis a more difficult and complex enterprise than studies of phenomena that are strictly additive.

**INSTITUTIONAL FRAMEWORKS, THEORIES, AND MODELS**

Given the need for multiple disciplines, and hence multiple disciplinary languages, and given the multiple levels of analysis involved in studying configural relationships among rules, relevant aspects of the world, and cultural phenomena, the study of institutions does depend on analytical work undertaken at three levels of specificity that are often confused with one another. These essential foundations are (1) frameworks, (2) theories, and (3) models. Analyses conducted at each level provide different degrees of specificity related to a particular problem.

The development and use of a general framework help to identify the elements and relationships among these elements that one needs to consider for institutional analysis. Frameworks organize diagnostic and prescriptive inquiry. They provide the most general list of variables that should be used to analyze all types
of institutional arrangements. Frameworks provide a metatheoretical language that can be used to compare theories. They attempt to identify the universal elements that any theory relevant to the same kind of phenomena would need to include. Many differences in surface reality can result from the way these variables combine with or interact with one another. Thus, the elements contained in a framework help analysts generate the questions that need to be addressed when they first conduct an analysis.

The development and use of theories enable the analyst to specify which elements of the framework are particularly relevant to certain kinds of questions and to make general working assumptions about these elements. Thus, theories focus on a framework and make specific assumptions that are necessary for an analyst to diagnose a phenomenon, explain its processes, and predict outcomes. Several theories are usually compatible with any framework. Economic theory, game theory, transaction cost theory, social choice theory, covenantal theory, and theories of public goods and common-pool resources are all compatible with the IAD framework discussed in this chapter. In this chapter, I illustrate the framework primarily with reference to our work on the theory of common-pool resources.

The development and use of models make precise assumptions about a limited set of parameters and variables. Logic, mathematics, game theory, experimentation and simulation, and other means are used to explore systematically the consequences of these assumptions in a limited set of outcomes. Multiple models are compatible with most theories. A recent effort to understand the strategic structure of the games that irrigators play in differently organized irrigation systems, for example, developed four families of models just to begin to explore the likely consequences of different institutional and physical combinations relevant to understanding how successful farmer organizations arranged for monitoring and sanctioning activities (Weissing and Ostrom, 1991). This is one of the models we have developed for the precise analysis of a subpart of the theory of common-pool resources.

For policymakers and scholars interested in issues related to how different governance systems enable individuals to solve problems democratically, the IAD framework helps to organize diagnostic, analytical, and prescriptive capabilities. It also aids in the accumulation of knowledge from empirical studies and in the assessment of past efforts at reforms. Markets and hierarchies are frequently presented as fundamentally different "pure types" of organization. Not only are these types of institutional arrangements perceived to be different, but each is presumed to require its own explanatory theory. Scholars who attempt to explain behavior within markets use microeconomic theory, whereas scholars who attempt to explain behavior within hierarchies use political and sociological theory. Such a view precludes a more general explanatory framework and closely related theories that help analysts make cross-institutional comparisons and evaluations.

Without the capacity to undertake systematic, comparative institutional assessments, recommendations of reform may be based on naive ideas about which kinds of institutions are "good" or "bad" and not on an analysis of performance. One needs a common framework and family of theories in order to address questions of reforms and transitions. Particular models then help the analyst to deduce specific predictions about likely outcomes of highly simplified structures. Models are useful in policy analysis when they are well tailored to the particular problem at hand. Models can be used inappropriately when applied to the study of problematic situations that do not closely fit the assumptions of the model.

THE INSTITUTIONAL ANALYSIS AND DEVELOPMENT FRAMEWORK

As indicated earlier, an institutional framework should identify the major types of structural variables that are present to some extent in all institutional arrangements, but whose values differ from one type of institutional arrangement to another. The IAD framework is a multilevel conceptual map (see Figure 3.1). One part of the framework is the identification of an action arena, the resulting patterns of interactions and outcomes, and evaluating these outcomes (see right half of Figure 3.1). The problem could be at an operational tier where actors interact in light of the incentives they face to generate outcomes directly in the world. Examples of operational problems include:

- The task of designing the incentives of a voluntary environmental action group so as to overcome to some extent the free-rider problem;
- The challenge of organizing local users of a forest to contribute resources to the protection of local watersheds to improve soil quality and water storage; and
- The question of how to invest in irrigation infrastructures so that capital investments enhance, rather than detract from, the organizational capabilities of local farmers.

The problem could also be at a policy (or collective-choice) tier where decision-makers repeatedly have to make policy decisions within the constraints of a set of collective-choice rules. The policy decisions then affect the structure of arenas where individuals are making operational decisions and thus impacting directly on a physical world. The problem could as well be at a constitutional tier where decisions are made about who is eligible to participate in policymaking and about the rules that will be used to undertake policymaking.

The first step in analyzing a problem is to identify a conceptual unit—called an action arena—that can be utilized to analyze, predict, and explain behavior within institutional arrangements. Action arenas include an action situation and