

An Introduction to the Institutional Analysis and Development (IAD) Framework for Forest Management Research

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Frameworks, Theories, and Models of Public Policy

The traditional approach to understanding public policy involves dividing the process into distinct units, or stages. Policy students are, no doubt, familiar with its major components: problem identification, agenda setting, formulation, adoption, implementation, and evaluation (see, for example, Anderson 1994). This way of thinking about policy has been termed the "stages heuristic" (Sabatier and Jenkins-Smith 1993: 1). In simplifying the often messy process of policy making and implementation, the stages heuristic has proved a helpful teaching tool. However, it is less useful in allowing us to address research questions and understand the complexity and interconnectedness of factors affecting policy processes and outcomes. In fact, it provides no basis for causal linkages, no testable hypotheses, and no means to aggregate knowledge across individual studies of different policy sectors using different disciplinary approaches. For these, we need more carefully constructed approaches.

To enhance precision in our conceptualization of public policy, it is important to distinguish among three conceptual levels: frameworks, theories, and models. At the broadest level, a framework organizes inquiry by specifying the general sets of variables of interest. A framework specifies classes of variables and their relationships to each other, providing a kind of intellectual scaffolding that give a coherent structure to inquiry (Schlager 1999). The analyst uses a framework to begin identifying which theories are relevant to a particular research question (Ostrom 1999). Numerous theories from a variety of disciplines may be compatible with a given framework, and selecting the most appropriate theory or theories depends on the particular phenomena studied. A framework allows the integration of several theories of action across domains that would otherwise be examined in isolation from each other. For example, explaining behavior within markets may rely on neoclassical microeconomic theory, while explaining behavior in a collective action setting may rely on noncooperative game theory. A framework

such as the Institutional Analysis and Development (IAD) framework permits analysts to make comparisons and evaluations (Ostrom et al. 1994).

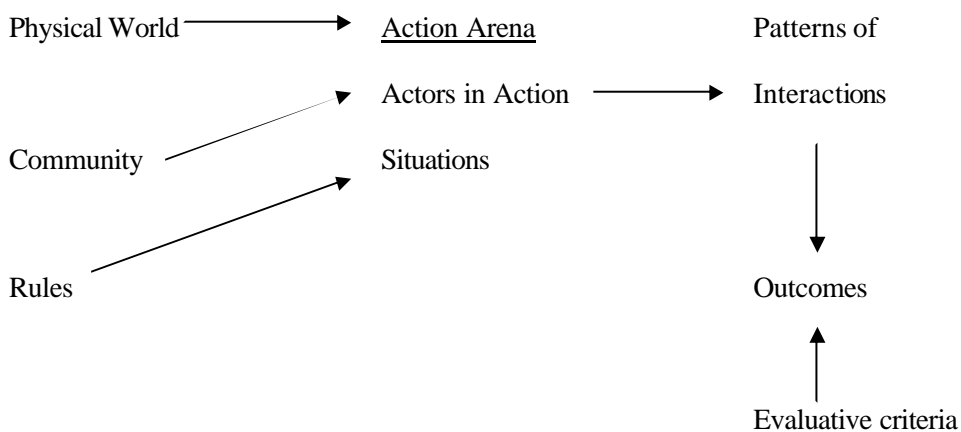
A theory is more specific than a framework. Theories causally link observed or modeled phenomena, providing interpretive structure. As sets of propositions explaining why events occur the way they do, theories describe patterns for interpreting data and understanding their larger significance (Hoover 2001). Different theories are applicable to different circumstances. For example, the microeconomic theory of perfect competition is applicable where individuals compete for scarce resources without strategic interactions, while cooperative game theory is appropriate where individuals interact with open communication and the possibility of creating binding agreements (Ostrom, et al. 1994:24). Political scientists may be more familiar with theories of voter mobilization or collective action, while public administration scholars may work with theories of organizational behavior or leadership. But all theories share a common function: to link and explain phenomena in a way that is generalizable beyond a given event.

Models lie at the most specific of the three conceptual levels. With precise assumptions about a limited set of parameters and variables, models have deductive, internal logic suited for testing hypotheses and predicting outcomes. Well-structured models are linked to particular theories. As Snidal (1985:34-5) explains, "[I]nterpretation of a model depends on the theory in which it is embedded... [M]ultiple models ... may be contained within a theory and emerge according to specific parametric conditions." (It should be noted that while modeling may be useful for testing theory, it is certainly not the only strategy; empirical work is a very different strategy that contributes to theory building (see McGrath 1981:188).) Clearly we must distinguish between models and theories, which, like frameworks, represent distinct conceptual levels.

The IAD Framework

One particularly useful framework, which has structured inquiry across a broad array of policy sectors and disciplines, is the IAD framework. Developed by Elinor Ostrom and other scholars associated with the Workshop in Political Theory and Policy Analysis at Indiana University, the IAD framework focuses the analyst's attention on individuals who make decisions over some course of action. Policy processes and outcomes are assumed to be affected, to some degree, by four types of variables external to individuals: (1) attributes of the physical world, (2) attributes of the community within which actors are embedded, (3) rules that create incentives and constraints for certain actions, and (4) interactions with other individuals (see Ostrom, et al. 1994).

Figure 1: The IAD Framework



Ostrom, et al. 1994

The most explicit description of the IAD framework appears in Ostrom, et al. 1994. It starts with the action arena as the unit of analysis and focus of investigation. An action situation is the “social space where individuals interact, exchange goods and services, engage in

appropriation and provision activities, solve problems, or fight” (p. 28). It includes the following elements: “**participants in positions** who must decide among diverse **actions** in light of the **information** they possess about how actions are **linked** to the potential **outcomes** and the **costs and benefits** assigned to actions and outcomes” (p. 29). An actor is the individual, or group functioning as a corporate actor, who takes action. Actors are characterized by four features: “(1) the preference evaluations that actors assign to potential actions and outcomes; (2) the way actors acquire, process, retain, and use knowledge contingencies and information; (3) the selection criteria actors use for deciding upon a particular course of action; and (4) the resources that an actor brings to a situation” (p. 33).

Rules are statements about what actions are “required, prohibited, or permitted and the sanctions authorized if the rules are not followed” (p. 38). They are created by humans and often the target of attempts to solve problems – often the solution tried is to change rules in hopes that new outcomes will emerge. The physical world varies from setting to setting and for forest ecosystems might include elements such as rate of growth, diversity of species present, climate and weather, terrain, and other physical factors that impact the state of the forest ecosystem and the humans that interact with it. Other elements include size of the resource, temporal and spatial variability of resource units, current condition (Ostrom 1990 p. 197). Finally, the community is an important context that affect individual actions, including things like “generally accepted norms of behavior, the level of common understanding about action arenas, the extent to which preferences are homogeneous, and distribution of resources among members” (p. 45).

The IAD framework is multi-dimensional, describing three levels of action: operational, collective choice, and constitutional choice (Kiser and Ostrom 1982; Ostrom et al. 1994). At the operational level are day-to-day activities that affect the world directly. The collective choice level is where decision-makers create rules to impact operational level activities. The constitutional level is where decision-makers determine how collective choice participants will be selected and the relationship among members of the collective choice body (e.g., voting rules,

agenda setting power). In essence, constitutional choice outcomes affect collective choice decision-making, which, in turn, affects operational level activities. Actors may move among the different levels, seeking their best outcomes within a given set of rules or attempting to change collective or constitutional choice rules to their advantage (Schlager and Blomquist 1996).

Governing the Commons: A Focus on Rules

Perhaps the best-known work using the IAD framework is Elinor Ostrom's 1990 book, *Governing the Commons*. In this now-classic work on common pool resource management, Ostrom tackles the question, Under what circumstances might communities relying on natural resources develop arrangements to sustainably manage those resources? She begins by arguing that the dominant perspective of common-pool resources, that they will be destroyed via the "tragedy of the commons," is actually a specific model whose results rely on a particular set of assumptions that often do not hold true in real situations. It is important to recognize this scenario as a special case rather than as a general result, in order to avoid a rush to either privatize resources or grant central government control over resources so that we can "solve" the common-pool resource "problem."

Through comparative case studies, Ostrom finds that successful management of common pool resources (in terms of the resource being sustained while local communities continue to derive benefits) often share a set of seven "design principles" focusing on the rules (see Table 1). These design principles are essential elements or components that "account for the success of these institutions in sustaining the CPRs and gaining the compliance of generation after generation of appropriators to the rules in use" (p. 90). Each of these items affects incentives such that "appropriators will be willing to commit themselves to conform to operational rules devised in such systems, to monitor each other's conformance, and replicate the CPR institutions across generational boundaries" (p. 91).

Table 1: Ostrom's Design Principles for Successful Management of Common Pool Resources

1. Clearly defined boundaries
2. Rules congruent with local conditions
3. Individuals affected can participate in modifying operational rules
4. Monitors are accountable to the appropriators
5. Graduated sanctions against violators
6. Ready access to conflict-resolution mechanisms
7. Recognition of rights to organize, by external government authorities
- (8). Nested enterprises, where the resource is part of a larger system

The IFRI Research Program

The International Forestry Resources and Institutions (IFRI) research program began in 1992 under the funding of the Forests, Trees, and People Programme at the United Nations Food and Agricultural Organization. The central purpose was to systematically gather and analyze data to understand how various kinds of governance arrangements affect the performance of forest management. Through the program, Elinor Ostrom and others developed a set of core instruments to incorporate social and natural science data from local forest communities. A network of affiliated IFRI scientists around the world have been using these instruments to jointly study local forest governance, management, and institutions.

The survey instruments include data about local institutions and socioeconomic and demographic variables, combined with forest mensuration techniques for a sample of 1-, 3-, and 10-meter radius forest plots for each forest. Following the IAD framework, these data focus on the “institutional, socioeconomic and demographic, and physical factors that affect human

incentives and behavior, and the impact of this behavior on local forest ecologies” (Gibson, et al. 2000, p. 11). An underlying assumption that forest conditions and human use of forests are determined largely at the local level, as local institutions filter the external factors such as national policies, global markets, etc. In the first book describing the IFRI research program, the countries examined included Bolivia, Ecuador, India, Nepal, and Uganda (Gibson, et al. 2000).

Across several case studies reported in Gibson et al. (2000), several key findings emerge. First, even within ecologically similar areas under the same national laws, numerous social factors explain variation in forest conditions. Different user groups, property rights systems, commodities harvested, and levels of rule enforcement interact with national laws in different ways. Second, successful rule enforcement depends on supportive appropriators who agree on what rules they should follow and why. If agreement is reached, then enforcement activities are successful in maintaining rule compliance and ensuring sustainable forest use. Third, sustainable institutions are costly to create and maintain. To be sustainable diverse members of local communities need to perceive that their benefits will outweigh their costs. Fourth, characteristics of the resource and the user that will affect sustainable institutions include:

R1. Feasible improvement: The forest is not perceived to be at a point of deterioration such that it is useless to organize or so under utilized that little advantage results from organizing.

R2. Indicators: The change in quality and quantity of forest products provides reliable and valid information about the general condition of the forest.

R3. Predictability: The availability of forest products is relatively predictable.

R4. Spatial location, terrain, and extent: The forest is sufficiently small, given the terrain, the transportation available, and the communication technology in use, that users can develop accurate knowledge of external boundaries and internal microenvironments, and they can develop low-cost monitoring arrangements.

A1. Saliency: Users are dependent on the forest for a major portion of their livelihood (or for other variables of importance to them).

A2. Common understanding: Users have a shared image of the forest (attributes R1, R2, R3, and R4 above) and how their actions affect each other and the forest.

A3. Discount rate: Most users have a sufficiently low discount rate in relation to future benefits to be achieved from the forest.

A4. Trust and reciprocity: Users trust one another to keep promises and relate to one another with reciprocity.

A5. Autonomy: Users are able to determine access and harvesting rules without external authorities countermanding them.

A6. Prior organizational experience and local leadership: Appropriators have learned at least minimal skills of organization and leadership through participation in other local associations or learning about ways that neighboring groups have organized.

Two additional variables are important: group size and heterogeneity. This research does not support a monotonic relationship between population and sustainability (smaller groups do not seem to be more likely to reach sustainable solutions).

National governments can increase the odds of sustainability by doing the following:

1. provide accurate information about the resource
2. provide arenas for conflict resolution and self-organization
3. provide mechanisms to back up local monitoring and enforcement
4. don't impose rules from the outside

The IFRI research program is ongoing. With so many variables affecting outcomes, we need a lot of cases in order to empirically estimate relationships among variables. IFRI has been building a very large data set to move beyond particular case studies, and additional publications are planned to analyze variables across many cases.

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