

Rees J 1990 *Natural Resources, Allocation, Economy, and Policy*. Routledge, New York

Stamp L D 1934 Land utilization survey of Britain. *Geographical Review* 24: 646-50

Watts M 1983 *Silent Violence: Food, Famine, and Peasantry in Northern Nigeria*. University of California Press, Berkeley, CA

Wescott J 1987 The 'practical range of choice' in water resources geography. *Progress in Human Geography* 11: 41-59

White G 1964 Choice of adjustment to floods. Department of Geography Research Paper No. 93, University of Chicago

Wolch J, Emel J 1998 *Annual Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands*. Verso, London

Young O 1999 (ed.) *The Effectiveness of International Environmental Regimes*. MIT Press, Cambridge, MA

Zimmerman E W 1951 *World Resources and Industries*. Harper, New York

G. Bridge

Resource Institutions

Human beings use, manage, or conserve resources through institutional arrangements. The absence of institutions leads to open access to resources, a condition in which overuse and depletion may be unavoidable. Institutions exercise an influence over resource management outcomes that is independent of the forces and dynamics that created them. Institutional innovation is therefore critically important in all efforts to influence resource use and conservation. Whether one attempts to rejuvenate depleted fisheries or prevent trade in endangered wildlife, to protect forests, or prevent the erosion of biodiversity, institutional change remains a crucial part of such efforts. Given the crucial role of institutions, it is clear that an understanding of the nature of institutions and their relationship to resources is necessary if the goal is sustainable management or conservation.

Despite variations in approaches to institutional analysis, resource institutions can be defined as sets of rules that can be crafted collectively or individually, and that have the power to shape actions related to the conservation and use of resources. Resource systems and institutional arrangements are distinct entities, and it is important to pay attention to the factors that lead to a better fit between a given resource and the rules that govern the management of that resource.

However, it is only in the second half of the twentieth century that the role of institutions in resource management has found substantial recognition in the scholarly and policy world. Part of the reason institutions are recognized as important is that many resources critical to human existence and subsistence are becoming increasingly scarce, and are difficult to manage under some universalizable institutional form. Very different institutional regimes may be necessary for different types of resources. Consider,

privatization, and the links between local and global regimes of food production;

(b) the question of 'nature' and environmental ethics, and their implications for the welfare of non-human species;

(c) discussions within critical legal theory and discourse theory on the ideologies and institutions that sustain particular actions towards nature (Proctor 1998, Wolch and Emel 1998).

Collectively these new directions offer a broad critique of the instrumentalism inherent in the categorization of parts of nature as 'resources'. A central objective is to destabilize conventional views of nature as a collection of severable, tradable resource components valued solely for their commodity value. By recognizing such common-place notions as 'resources,' 'wilderness' and 'nature' as historically and geographically specific social constructions, new directions within resource geography contribute to an understanding of the roles gender, race, and class have played in domesticating the natural world.

See also: Energy, Geography of; Resource Institutions; Water Resources

Bibliography

Anderson T, Leal D 1992 *Free Market Environmentalism*. Westview Press, Boulder, CO

Barrett H, Morse C 1963 *Scarcity and Growth: The Economics of Natural Resource Availability*. Johns Hopkins University Press, Baltimore, MD

Blake P, Brookfield H 1987 *Land Degradation and Society*. Methuen, London

Feeny D, Berkes F, McCay B, Acheson J 1990 *The tragedy of the commons: Twenty years later*. *Human Ecology* 18: 1-19

Gilbert G K 1877 *Report on the Geology of the Henry Mountains*. US Government Printing Office, Washington, DC

Hardin G 1968 *The tragedy of the commons*. *Science* 162: 1243-8

Hewitt K 1983 (ed.) *Interpretations of Calamity*. Allen and Unwin, Boston

MacKinder H 1887 *The scope and methods of geography*. *Proceedings of the Royal Geographical Society* 9: 141-60

Mahnus T 1798 (reprinted 1986) *An Essay on the Principle of Population*. Penguin Classics, Harmondsworth, UK

Mark K 1967 *Capital* (3 volumes). International Publishers, New York

Michell B 1997 *Resource and Environmental Management*. Longman, Harlow, UK

Murphy R 1954 *The geography of mineral production*. In: James P, Jones C (eds.) *American Geography: Inventory and Prospect*. Syracuse University Press, Syracuse, NY

Powell J W 1879 *Report of the Lands of the Arid Region of the United States (with a more detailed account of the lands of Utah)*. US Government Printing Office, Washington, DC

Proctor J 1998 *The social construction of nature: relativist accusations, pragmatist and critical realist responses*. *Annals of the Association of American Geographers* 88: 352-76

Pulido L 1996 *Environmentalism and Economic Justice: Two Chicano Struggles in the Southwest*. University of Arizona Press, Tucson, AZ

(Knight 1992, North 1990). Instead, individuals and groups often act to create new resource institutions that would benefit them, rather than address problems of scarcity or risk. Particular institutions reflect existing distribution of power and wealth in a society or a group.

3. Sustainability of Resource Institutions

Perhaps the most critical question about resource institutions is how and under what conditions do they lead to sustainable management and conservation of resource systems. Group size, heterogeneity within groups, migration levels and population change, technological innovation, changing levels of demand for resources, uncertainty and sudden shocks, and cross-scale effects play an important role in determining the sustainability of institutions and resource systems (Keohane and Ostrom 1995). For certain kinds of resources, especially global commons, new institutional mechanisms have emerged to address issues of complexity and heterogeneous subpopulations (Haas 1997).

Writings on resilience and adaptive management have generated important insights about the extent to which resource institutions can be sustainable in the long run (Holling 1973). Human institutions perform best when environments are predictable, yet many resource systems are characterized by potentially highly uncertain and variable processes. To date, research on institutions has not incorporated all the lessons learnt in risk-hazard studies on how sudden variations and uncertainty affect resource management needs. In part this is so because a formal theory of resource institutions requires a theory of human behavior that is mathematically rigorous and tractable, withstands empirical testing, and fits into a model of resource systems that can address fluctuations and surprise.

See also: Environmental and Resource Management; Environmental Vulnerability: Human-Environment Relationships; Institutional Economic Thought; Institutionalism: Land Degradation, Sustainable Development

Bibliography

Goodin R E (ed.) 1996 *The Theory of Institutional Design*. Cambridge University Press, Cambridge, UK
 Haas P M (ed.) 1997 *Knowledge, Power, and International Policy Coordination*. University of South Carolina Press, Columbia, SC
 Holling C S 1973 Resilience and stability of ecosystems. *Annual Review of Ecology and Systematics* 4(1): 1-23
 Keohane R, Ostrom E (eds.) 1995 *Local Commons, Global Interdependence. Heterogeneity and Cooperation in Two Domains*. Sage, London

another, in real life most resource institutions do not easily fit the mold of market, state, or community. For the operation of each of these forms of institutions, implicit or explicit understandings that shade into other forms are necessary. For example, often markets and private property arrangements work better only when the force of the state is available to enforce the security of property.

2. Resource Institutions, Rules, and Power

Since resource institutions are sets of rules and norms that shape action, it is necessary to understand the broad types of rules that are most important in making institutions effective. Effectiveness implies three categories of rules: the ability to create new rules and modify old ones pertaining to resources; the ability to implement and ensure compliance to existing and new rules; and the ability to adjudicate disputes that arise in the effort to create rules and ensure compliance. Rules pertaining to resources define who gets to access a resource, who gets to use them, who is excluded from a resource, and how and when a resource can be transferred from one individual or group to another. Institutional arrangements are likely to be ineffective when human beings can make these above rules but not enforce them, or enforce existing rules but not change them in case of deficiencies. Mechanisms that allow adjudication of disputes among resource users and managers are necessary if resource institutions are to retain their force over time. These three categories of rules correspond to a more familiar division in government: executive (making, implementing, and enforcing of decisions), legislative (creation of rules), and judicial (adjudication of disputes).

The constituent parts of all resource institutions are born as a result of human choices. Three important determinants of human institutional choices are scarcity, risk, and redistribution. Greater scarcity of resources in a group creates incentives to define institutional arrangements ever more precisely so that benefits from resources are not dissipated. Indeed, some scholars have seen this dynamic of induced institutional change to be prominent enough to argue that it is universal (Netting 1981). Institutions may also change in response to higher levels of risk in the environment. Collective action necessary for institutional emergence can be conceptualized as a response that addresses the need to smoothen inter-temporal fluctuations in production (Wade 1994). These views of institutional change are insufficiently attentive to variations in the incentives of group members, and to the politics that such variations generate. A more political view holds that institutional change need not occur only in response to greater scarcity in a group, nor lead to greater efficiency

- Knigh J 1992 *Institutions and Social Conflict*. Cambridge University Press, Cambridge, UK
- National Research Council 1986 *Proceedings of the Conference on Common Property Resource Management*. National Academy Press, Washington, DC
- Netting R 1981 *Balancing on an Alp: Ecological Change and Community in a Swiss Mountain Community*. Cambridge University Press, New York
- North D C 1990 *Institutions, Institutional Change, and Economic Performance*. Cambridge University Press, Cambridge, UK
- Osrom E 1990 *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, New York
- Wade R 1994 *Village Republics: Economic Conditions for Collective Action in South India*. Institute for Contemporary Studies Press, San Francisco
- Williamson O E 1985 *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. Free Press, New York
- Agrawal A

Resources and Environment: Contingent Valuation

A major impediment to performing a benefit-cost analysis involving the provision of a new public good or a change in an existing public good is that public goods are not routinely bought and sold in markets. Hence 'prices,' the economic data routinely used by economists as indicators of the economic value of goods, are not available for public goods such as environmental amenities. To overcome this obstacle, economists have developed (Freeman 1993) an indirect valuation approach that infers economic value from observations on consumer behavior with respect to marketed goods having a relationship to the public good, and a direct approach that gives consumers the opportunity to make choices with respect to the public good. The indirect approach relies upon one of two factors: that the public good can be 'bundled' in as one of the attributes of a private good (e.g., close proximity to a public park) and that it is sometimes necessary to make expenditures of money or time to use the public good (e.g., driving to a hiking trail in a national forest). The direct approach can be implemented by subjecting the public good, such as a vote in a referendum to provide the public good. The now common survey variant of the direct approach has come to be known as contingent valuation (CV) because the estimates of economic value obtained are 'contingent' on the features of the scenario posed in the survey.

CV surveys differ from other surveys on public policy issues in several important ways. First, the entire survey is devoted to describing the public good (or a small number of public goods) of interest.

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Second, they differ in that their major purpose is to obtain an estimate of the relevant Hicksian consumer surplus measure; maximum willingness-to-pay (WTP) to obtain a desired good not currently possessed, or minimum willingness-to-accept (WTA) compensation to voluntarily give up a good currently possessed. CV surveys are typically organized in the following manner which reflects current practice: (a) an introductory section identifying the sponsor and general topic, (b) a section asking questions about prior knowledge about the good and attitudes toward it, (c) the presentation of the CV scenario including what the project was designed to accomplish, how it would be implemented and paid for, and what will happen under the current status quo situation if the project were not implemented, (d) question(s) asking for information about the respondent's WTP/WTA for the good, (e) debriefing questions to help ascertain how well respondents understood the scenario, and (f) demographic questions. Mitchell and Carson (1989) provide a comprehensive overview of the issues involved in the design and analysis of CV surveys.

1. Development

Citacy-Wantrup (1947) put forth the first well-developed proposal on the need for CV surveys in a piece on the difficulties of measuring all the benefits of soil conservation programs. Empirical implementation of CV initiated by Davis (1963), in his Harvard dissertation, sparked considerable interest in the technique. He later compared a CV estimate with a corresponding estimate based on the travel cost method (an indirect approach then also being newly developed) and found that the two approaches produced similar estimates.

CV surveys were initially seen as having three distinct advantages. First, CV can obtain useful information where data on past consumer behavior had not been collected. Second, CV permits the creation and presentation of scenarios that provide new goods or changes in existing goods that were substantially outside the range of current consumer experience. Third, CV allows measurement of the desired Hicksian consumer surplus measure rather than its Marshallian approximation. For many economists, the major drawback to CV-based estimates was that they were based upon stated preferences rather than observed behavior.

A paper by Randall et al. (1974) greatly increased interest in CV. It valued changes in air quality necessary to maintain scenic vistas in the Southwest. The indirect valuation approach was not capable of being applied in this instance because all people in the area share the good equally (and hence, not bundled differentially into housing prices) and no expenditure of time or money is needed to enjoy it.