

9-6-96
WORKSHOP IN POLITICAL THEORY
AND POLICY ANALYSIS
513 NORTH PARK
INDIANA UNIVERSITY
BLOOMINGTON, INDIANA 47405-3186
REPRINT FILES

**Roles, Rules and Relationships:
Using Exogenous Factors in
Macro and Micro Institutional Analysis**

by

Ajay Pradhan
Indiana University

*Paper Prepared for the Mini-Conference
on Institutional Analysis and Development*

**Workshop in Political Theory and Policy Analysis
Indiana University, Bloomington**

Fall 1994

Roles, Rules and Relationships:
Using Exogenous Factors in
Macro and Micro Institutional Analysis

by

Ajay Pradhan

1. Introduction

This paper is about considering various factors that determine the behavior and choices of human beings, in the analysis of human institutions at macro and micro levels. I will pay particular attention to the natural and human-imposed limitations to the successful design and operation of institutions. Specifically, I will consider two factors that influence the behavior and choices of human beings and their ability to enter into rule-ordered relationships: (1) domination of national-level centralized bureaucratic order over local-level self-governing order, and (2) effects of natural responses to overpopulation.

I call these factors exogenous, because they often act as though control over them lies with entities other than the self-governing units of individuals themselves. Further, I consider the first factor as human imposed, because it is, as we shall see later, the case of domination by a centralized bureaucracy over the local population; the second factor is natural because I will address the question of changing role of individuals in behaving in a certain way and making choices as a response to the natural effects that overpopulation can cause to the environment. The question that I want to raise in this paper is: Why is it that certain factors that influence people's choice and behavior are seemingly beyond their control?

Human beings face diverse problems and opportunities, and there are diverse and alternative institutional arrangements to deal with problems that are common to human societies. Such institutional arrangements are based on choices that individual human beings make as they relate to one another in ways that are ordered by rules. The way human beings order their choices as they relate to one another is what we call political order or institutional order.

An understanding of such order is necessary because it is only through such understanding that we can make comparative study of how each of the institutional order works or does not work. In this paper I shall mainly attempt to show that choices of human beings at one scale of aggregation (at the micro level) are affected by choices made at another scale of aggregation (at the macro level). To illustrate my assumption and argument, I shall consider Nepal's experience in linking macro and micro

institutions and how roles of individuals at local level is affected by roles of the government bureaucracy.

I shall also attempt to make a conceptual analysis of how choices of human beings are affected by their environment, which I define in an ecological sense as being composed of both their biophysical world and themselves and their interactions. In particular, I will take the issue of how rising human population affect the choices that human beings can make.

In the following section I shall try to define the linkage between human beings and their environment and how their behavior and choices in relating to one another is affected by the changing structure and function of their environment. In the third section, I shall specifically address how overpopulation acts as an exogenous factor in shaping human behavior. In the fourth section, I will focus my attention on different options available for ordering human societies. Following this, I will present Nepal's experience in illustrating how political order at higher level often hinders self-governing capacity of local people. And at the end, I will draw conclusions based on the discussion presented in this paper.

2. Nexus Between Human Beings and their Environment

Scarcities in nature necessitate establishment of working rules, and all systems of rules specify types of positions and relationships among those who assume certain authority role and occupy position in relation to that specification of authority role. By drawing upon the theoretical reasoning made by Commons (1968), I suggest that behavioristic, or volitional, theories of human nature are theories of relationship of man to man and man to nature, and these theories reveal themselves in rules of conduct governing transactions and relationships between man and man. Commons (1968) says that volitional theories are underlain by Malthusian principle of scarcity.

I shall use this theoretical reasoning to make an argument in the following section of this paper, that Malthusian principle of scarcity applies to inherent limitations and scarcity in nature. In other words, my argument will be that Malthus' dire predictions of the effects of overpopulation can be explained in terms of the stress placed by rising population on the scarce resources. Malthus' predictions were rejected by Marx, who laid the blame for poverty on inequitable distribution of goods and mismanagement of the factors of production (Greenwood and Edwards, 1973). By denying the capacity of rising population in placing a stress on a scarce resource base, and consequently on the working rules instituted to manage the resource base, Marxist theory has failed in taking into account one of the most fundamental puzzles that are normally studied by ecologists: the inherently limited nature of the natural resource base.

Before, addressing the issue of overpopulation as an exogenous factor shaping human behavior and choices, let me first elaborate on the nexus between human beings and their environment. The

relationships among individuals can be explained in terms of what Searle (1969) would call "institutional facts" that refer to rules of the game in which individuals participate, and thus get related to one another. I would argue that it is not only the relationship *among* one another that gives structure and function to the institutions that, in turn, govern the relationships, but also the relationship that exists *between* human beings and their biophysical environment.

If considered alone, the physical environment can be explained in terms of Searle's "brute facts" which he refers to only the components of a system, and not the relationships existing within it. Behavior of human beings and the choices they make as they relate to one another are influenced by rules (E. Ostrom, 1986, 1990; Ostrom, *et. al.*, 1994). But, the action situation of an individual is not solely defined by the relationship that each individual has among one another, but also by relationship he has with his physical world (E. Ostrom, 1992). In other words, their behavior and choices are affected by their living environment as well, because people's choices also depend upon their physical needs that are met by their environment.

Drawing upon the philosophy presented by V. Ostrom (1994), I would say that adaptive behavior of human beings and their choices depend upon the behavior and choices of fellow human beings as well as their constraints and potentials of their environment. In other words, the adaptive behavior of human beings, their choices, and their condition are all interrelated phenomena, and all these affect and are affected by the constitution of order in human societies. How humans exhibit adaptive behavior or how their behavior is ordered depends on the structure of adaptive arrangements or mechanisms within which the behavior is ordered.

Such arrangements are capable of producing a wide variety of options for individual human beings to consider in making choices and exhibiting behavior. Making a choice is, therefore, dependent on the variety of options available, and adaptive behavior depends on the choices one can make. In order to make the adaptive behavior last, the choice options must be retained. Therefore, as pointed out by V. Ostrom (1994), an evolving system of adaptive order involves variation, selection, and retention.

By extending this philosophy, I would argue that adaptive behavior of human beings, and their choices in constituting order are affected by what kind of environment they live in. At the national level, for example, the aggregate choice of a country's people in establishing relations with their neighboring countries could be affected by what type of regime their neighboring countries have.

And at the local level, choice of a community in constituting order for managing their common resource is, among others, affected by how many resource users are there. Order is necessary to make optimal choices, because unlimited choice is restricted by the natural limitations of the environment and the number of human beings.

3. Overpopulation as an Exogenous Factor

We can relate the issue of overpopulation to natural limits of the environment and people's changing behavior and choices to the environment's natural response to the demands placed on it by a rising population.

At the local levels, resource users craft institutions to manage their commonly-held limited resources. How people make choices in constituting order determines whether the resource will be sustainably managed or depleted. Existence of direct linkage between overpopulation and resource depletion has been indicated by many (Piemental, *et al.*, 1994; Abernathy, 1993; Low and Heinen, 1993; Ness, *et al.*, 1993; Hardin, 1993; Fisher, 1993; Ehrlich and Ehrlich, 1990; Duraing, 1989). However, existence of direct linkage between overpopulation and resource depletion and degradation has been called into question again (Agrawal, 1994).

Agrawal's (1994) main contention is that the adverse effects of overpopulation and market forces on forest resources is attenuated, especially at the local level, by institutional arrangements, and he questions the widespread notion that controlling overpopulation will solve the resource depletion. The focus of the argument seems to be that in the face of adverse pressures from the state, from demographic changes, and from market forces, local communities can effectively manage common-pool resources through collective effort.

It must be acknowledged that there is no exclusive linkage between resource degradation and overpopulation, and reducing population growth rate alone will not solve the resource depletion and degradation problem. It must also be fully acknowledged that human beings have tremendous capacity to craft institutions to solve resource sharing problems; many studies on self-governing institutions in common-pool resource situations have shown this (Ostrom, 1990; Ostrom, *et al.*, 1993; McKay and Acheson, 1987; Arnold and Campbell, 1986, McKean, 1986, 1992). In this regard, I fully support the view presented by Agrawal (1994).

However, I think, it is entirely legitimate to link overpopulation with resource degradation problem in an important way, although we cannot heap our exclusive blame on overpopulation phenomenon for all environmental and natural resource degradation problems. We must answer two important questions related to institutional capacity to solve human problems and the nexus between overpopulation and resource condition: (1) will institutional arrangements for managing local forest resources remain same if population continues to grow indefinitely in a given area? (2) how will the rules affecting excludability of users transform and change with the rise in the number of potential resource users? I would argue that rules evolve and transform with the rise in the number of potential resource users, because rules by themselves cannot address the question related to *natural* limits and carrying

capacity of the environment. Ecologists tell us that the natural capacity of given land to sustain a rising population cannot be stretched indefinitely.

My point is that rules do give rise to optimal solution to resource management, but the demand of the increasing population for resources will, in all likelihood, increase and not decrease or remain constant. Increased demand will have to be met either by one locality or another. I, therefore, think that population growth beyond certain level does put increased demand-side pressure on the environment and can create problem as regards to the supply of resources. To illustrate this point, I offer an ecological analogy, for ecology studies the natural limits of the environment and how those natural limits are affected by a growing population.

The rule-ordered relationship, both among the human beings, and between them and their environment, is what we study in analyzing institutions and their strengths and weaknesses. The science of ecology provides an analogy to the linkages existing *among* human beings, and *between* human beings and their environment. Although the definition of ecology has been modified and remodified, the basic concept remains the same as Ernst Haeckel defined it for the first time in 1869: the total relations of the animal to both its organic and its inorganic environment (Krebs, 1994).

Ecology is the study of relationships or interactions among living things as well as between living things and their nonliving environment. Since, aggregation of living and nonliving things constitute the nature, ecology is also called the study of the structure and function of nature (Odum, 1963, Odum, 1983). In ecology, the aggregation level at which both structure and function of nature which is comprised of both living and nonliving things, is what ecologists call ecosystem. An ecosystem is a unit of the environment made up of living and nonliving components that interact with interchanges of nutrients and energy (Cox, 1993).

Like human relationships, relationships and interactions in an ecosystem are governed by rules, some of which are natural and others created by organisms themselves. For example, hierarchy among individuals members of an animal population and their territorial claims are maintained by rules. Just like human institutions, ecosystem is also a system of rules that govern and order relationships. When rules are broken, the structure and function of the ecosystem become vulnerable to breakdown, just like in human institutions which break down when rules are broken and left unrepaired.

Although terms like "behavior" and "choices" can only be attributed to humans and animals, plants do behave in a certain predictive manner determined by the natural laws. However, trees in a forest and other plants do interact among one another and other components of the ecosystem in which they are found. Since the forest trees do not have unlimited capacity to withstand exogenous pressures, the pressure imposed by rising population will certainly make them vulnerable to death and degradation.

However, behavior and choice of human beings are not only affected by an environment with too many people, but by many other factors as well. Hence, controlling overpopulation will not provide a panacea. It is ironic, however, that governments in many countries distort the nexus between resource depletion and overpopulation and other factors, and put unfair blame on overpopulation as the cause of many resource related problems. This is an example of how overpopulation as an exogenous factor in shaping the behavior and choices of people can be used by governments to ignore self-governing capacity of local people.

4. State, Market or Self-Governing Institution

Order in societies are brought about in a number of different ways: for example, through state **intervention**, through **market** mechanisms, and through self-governing institutions. Traditionally institutional responses to solving problems concerning human relations relied on either state or market mechanisms to bring order in societies and in managing resources. Capacity of self-governing institutions in bringing and maintaining order for various purposes, including managing resources, was not fully recognized relatively recently.

For example, Hardin (1968) in his one of the most talked-about articles, *Tragedy of the Commons*, indicated that the common lands, due to their being unowned and uncared by anyone, would invariably face environmental degradation from their overuse and overexploitation. In his argument, he did not address the possibility of common lands being well-managed by resource users through the implementation of properly designed rules to guide their resource-using activities. Implicitly, Hardin advocated either state control of the common lands or assigning private property rights to individuals over such common lands.

Policy makers and academics have given little serious attention to the concept of strong citizenship, whereby citizens are actively involved in a diverse set of institutions to govern their lives. State and market approaches to solving the problems associated with common-pool resources are possible, but do not exhaust the range of possibilities (McGinnis and Ostrom, 1992). Besides, these approaches are difficult because of the demand needs of the resource users. In such circumstances, local-level self-governing institutions provide the best solution. This seems to be understandable at the micro level involving local-level common-pool resources, but it becomes somewhat difficult to see how self-governing institutions at macro-level are created and maintained.

In contrast to the local levels, the reason for creating macro-level, self-governing institutions may be readily understandable for some purposes while less-readily understandable for others. This is perhaps due to that the concepts of self-governance are so little understood or used to craft new political

institutions that many nations continue to pursue the course of state-run society, rather than that of a self-governing society.

Interest in self-governance is, nevertheless, growing and part of the interest arises from an increasing numbers of examples of citizens crafting their own institutions to solve problems that bureaucratic state has been unable to address satisfactorily. The Institutional Analysis and Development (IAD) framework, that has evolved through work by scholars associated with Workshop in Political Theory and Policy Analysis, has focused on evaluation of alternatives to state and market institutions, including self-governing institutions that are not controlled by market or state forces (E. Ostrom, *et al.*, 1994; E. Ostrom, *et al.*, 1993; E. Ostrom, 1986, 1987, 1992; V. Ostrom, 1991; V. Ostrom, *et al.*, 1988; Oakerson, 1986; Kiser and Ostrom, 1982). In order to explore the constitution of order in human societies, we first need to understand how individuals make choices given the choices or possible choices of other individuals (V. Ostrom, 1994). This depends upon how people relate to each other in ways ordered by rules, at macro and micro levels.

5. Linkage Between Micro and Macro Institutions

In order to understand institutional orders, rule-ordered relationships have to be studied at multiple levels. Certain human problems are managed by local-level institutions and others by regional, national and international-level institutions. The local-level problems require micro-level of institutional analysis whereas problems at larger scales require macro-level of institutional analysis. The main assumption I am going to make here is that the macro-level political order affects the micro-level political order, and, consequently, national level policies affect the local level policies.

To illustrate this, I shall use as an example how Nepal government's highly centralized bureaucracy affects the ability of the local people to establish self-governing bodies. Before doing so, however, I wish to make a distinction between the terms micro-institution and macro-institution in the context of present discussion.

5.1 Macro and Micro Institutions

Both micro and macro institutions are the artifacts of human ingenuity and are crafted to govern and order human relationships as they interact with one another and with their environment. In crafting these institutions, therefore, the artisans of institutions consider the relationship that exists not only among the human individuals but also with their environment. In other words, the nature of institution depends upon what type of relationship exists and what type of relationship is desired. One single type of institution may not be adequate to deal with all sorts of puzzles that human beings face, nor can it manage

to produce and maintain goods under all possible property regimes. No single form of organization can serve as an appropriate means for ordering all human social relationships (V. Ostrom, *et al.*, 1994).

In the context of Nepal, the government bureaucracy can be considered a leviathan (Hobbes [1651] 1962) because of its highly-centralized structure and its closeness to representing one single authority. The centralized bureaucracy does not represent any contract in the Nepali society. Like leviathan, it is an artificial machine for the enforcement of social rules. It however appears that the social rules that provide self-governing characteristics to human relationships at the most basic level are hindered from being created and maintained by the very savior of social rules that the bureaucracy is.

The type of centralized government and yet decentralized administration that Tocqueville ([1840] 1988) found in America, does not exist in Nepal. In Nepal, there is a centralized government, and there is a centralized bureaucratic administration. This is what we may call Nepal's macro institution, and can be sharply distinguished from the many self-governing micro-level institutions that people at local levels have established for a common purpose.

5.2 Macro-level Bureaucratic Order as Exogenous Factor

Nepal offers an appropriate example of how macro-level government bureaucracy hinders the establishment of micro-level self-governing institutions, by implicitly forcing local-level people to make choices that they otherwise would rather not be making. Like in many other countries, Nepal's government has relied mostly on state approaches to constituting order at various levels of society. Why is it that Nepal's government has relied so much on state-regulated interventions and not on self-governance?

One reason could be that policy makers in Nepal's government have lacked a theory to design policies for encouraging establishment of self-governance institutions. This, I think, is not the only reason why designers of Nepal's old as well as new Constitution, which was promulgated only three years ago, and policy makers in Nepal's government have been mostly skeptical of the self-governing capacity of people, and, therefore, have resorted to coercive state solutions.

Political leaders and bureaucrats have professed the virtue of decentralization in their policies. Even the leaders of newly-elected Communist government have declared that centralization of authority breeds evil in society. However, examination of the country's centralized bureaucracy, centralized national planning, centralized feudalistic taxation systems all indicate that decentralization rhetoric in Nepal is still little more than just "trickle-down" government; this point out to the inherent reluctance of those exercising power at the center in giving up power. Still, the government's development philosophy and policy approaches have predominantly assumed that the bureaucratic apparatus is the only credible

agent of social change (Pradhan, 1994).

5.3 Centralized Bureaucratic Administration

Several factors are responsible for non-performance the government bureaucracy: lack of incentive, centralization of administration, and cumbersome bureaucratic procedures (World Bank, 1987). Concentration of authority has led to hoarding of discretion and overloaded public administration at the center and underutilized public administration in the field. A reluctance to delegate authority to mid-level management and to the field is reflected in an unwillingness by those on the spot to innovate or to take risks, leading to perceptions of unresponsiveness by the public.

The concentration of decision-making power far from the point of intervention is epitomized by the disproportionate number of senior staff based in Kathmandu, the country's capital—fifty to sixty percent of the government officials work in the capital, and the capacity of district-level staff to share authority with local communities is obviously limited by the centralist orientation of their own parent departments (World Bank, 1987).

5.4 Centralized Development Planning

Nepal's government has a tendency to attempt to do more than its budgetary and manpower resources permit—which is a problem arising from the centralized planning procedure. Any project undertaken has to be included in the Five-Year Plan prepared by the National Planning Commission, the government's national planning agency. Consequently, line ministries have tended to submit to the National Planning Commission for inclusion more projects than they are able to manage (World Bank, 1987).

A cycle of over-commitment, underfunding and *ad hoc* arrangements in obtaining resources during implementation is the result. Development planning in Nepal is characteristically top-down or trickle-down in nature. Despite intentions to the contrary, physical targets and expenditure guidelines are still established in Kathmandu, with only perfunctory attention given to local constraints, needs or popular demand.

The National Planning Commission makes decision as to what program is to be implemented not only at the national level but also at the lowest level of administration. The planning that is done for even the remotest of the country's fourteen administrative zones, seventy-five districts and more than four thousand villages is a prime example of highly centralized planning. On the basis of the plan prepared at the National Planning Commission, the government make the budgetary allocation to its sectoral ministries which, in turn, administer the fund down the hierarchical level.

5.5 Half-hearted Decentralization Efforts

The passage of the Decentralization Act of 1982 and Decentralization Rules of 1984 is often considered a major move to reform the highly centralized bureaucratic system of public administration in Nepal. Public administration issues have long been recognized as major impediments to development, and the government has commissioned several studies to come up with recommendations for making reforms. However, the commissions, which started as far back as in the late 1960s, made recommendation towards only improving incentive structure within the bureaucracy, and did not even hint the need for encouraging self-governance at local levels.

The Decentralization Act of 1982 does recognize, at least in principle, the capacity of local community members for collective action in various situations involving common-pool resources. For example, in the forestry sector, the government has sought to improve its forest management performance by transferring forest lands back to village control (Arnold and Campbell, 1986). This obviously seems to acknowledge that indigenous, self-governing capacity for resource management exists among the resource-users at the local level (Arnold, 1993; Basnet, 1992; Campbell, 1978; Campbell, et al., 1987; Dani and Campbell, 1986; Environmental Resources Ltd., 1989; Fisher, 1989; Gilmour, 1988; Gilmour and Fisher, 1991; Gilmour, et al., 1989; Messerschmidt, 1981, 1984, 1986, 1987; Wallace, 1986).

But a careful evaluation of the implementation of the Act indicates that the government is simply using this Act to extend its arm to the local level by putting more personnel at the local level and by implementing local level programs through the locally-elected, but government-controlled local level civic bodies called village development committees (Pradhan, 1994). The role of the committee personnel has been limited to carrying out the sanctions received from the higher authority in the government hierarchy. If people's participation occurs, there is very little self-governance achieved. Decentralization of power is a precondition for self-governing societies. Centralization of power, as in many communist nations, gives rise to what Tocqueville ([1835] 1988) calls the tyranny of the majority.

6. Summary and Conclusion

In this paper, I have used two examples to represent what may be called exogenous factors that influence human behavior and the choices human beings make. I did not dwell on how individual behavior is shaped by the relationship that the individual has with other individuals in his community and society. Rather, I dwelt on factors with which individuals have exogenous relationship. By exogenous factor and relationship, I mean those factors and relationships which have profound influence on the individual's behavior, but over which aggregate community and society have minimal to negligible influence. In other words, exogenous factors are those that work from outside the control of community

as a whole. The two factors I have used are the impact of overpopulation and the impact of domination of a centralized bureaucracy.

In discussing the chain-effects of overpopulation, I argued that overpopulation places a stress on natural resources which characteristically have inherent natural limits. Scarcity is only one of the first few symptoms of that stress, that resources exhibit in response to overpopulation; other symptoms could be various degradation effects. I then argued that since human behavior is shaped by the type of relationship they have with one another and with their biophysical environment, any change in the pattern of interaction between them and their environment and resources they use, certainly influences their behavior which eventually will be manifested in a modified pattern of relationship they have with one another.

The other exogenous factor that I attempted to examine was the role of centralized bureaucracy in shaping human behavior at local levels. The government relies heavily on a big bureaucracy that is highly centralized, and pays little attention to self-governing capacities of local people. This is due in large part to the dominant role played by the culturally and economically elite individuals in restricting the role of constituting order at both macro and micro levels to themselves and excluding the large mass of people from the process of crafting institutions.

On the basis of the analysis that I presented in this paper, we can try to answer the question, Why is it that certain factors that influence people's choices and behavior are seemingly beyond their controlled? The answer, I think, is that these factors are exogenous to the action situation in which individuals make their choices. Through collective action, it is possible to internalize these exogenous factors to greater or lesser extent, depending upon whether the factors are human-imposed or imposed by the nature. I think it is important to consider in institutional analyses these and probably other exogenous factors that are constantly at play in shaping human behavior, for human behavior specifies choices that individuals make as they relate with one another. Rules, in turn, specify position roles of individuals, and also specify relationship among those who assume roles assigned to the position they occupy.

Reference

- Abernathy, V. 1993. *Population Politics: The Choices that Shape Our Future*. New York: Plenum Press.
- Agrawal, A. 1994. The illogic of arithmetic in resource management: Overpopulation, markets and institutions as explanations of forest use in the Indian Himalayas. Paper presented at the Workshop on the Workshop, June 16-18. Bloomington, Indiana: Workshop in Political Theory and Policy Analysis, Indiana University.
- Arnold, J.E.M. 1993. Management of forest resources as common property. *Commonwealth Forestry Review*, 72(3): 157-161.
- Arnold, J.E.M. and J.G. Campbell. 1986. Collective management of hill Forests in Nepal: The Community Forestry Development Project. In *Proceedings of the Conference on Common Property Resource Management*, National Research Council, pp. 425-454. Washington, D.C.: National Academy Press.
- Basnet, K. 1992. Conservation practices in Nepal: Past and present. *Ambio*, 21(6):390-393.
- Campbell, J.G. 1978. Community involvement in conservation: Social and organizational aspects of the proposed Resource Conservation and Utilization Project in Nepal. Report to the U.S. Agency for International Development, Kathmandu.
- Campbell, J.G., R.J. Shrestha and F. Euphrat. 1987. Socioeconomic factors in traditional forest use and management: Preliminary results from a study of community forest management in Nepal. *Banko Jankari*, 1(4):45-54.
- Commons, J.R. 1968. *Legal Foundations of Capitalism*. Madison, Wisconsin: The University of Wisconsin Press.
- Cox, George W. 1993. *Conservation Ecology: Biosphere and Biosurvival*. Dubuque, Iowa: Wm. C. Brown Publishers.
- Dani, A.A. and J.G. Campbell. 1986. Sustaining Upland Resources: People's Participation in Watershed Management. ICIMOD Occasional Paper No. 3. International Center for Integrated Mountain Development, Kathmandu.
- Durning, A. 1989. *Poverty and the Environment: Reversing the Downward Spiral*. Washington, D. C.: Worldwatch Institute.
- Environmental Resources Ltd. 1989. Natural Resource Management for Sustainable Development: A Study of Feasible Policies, Infrastructures and Investment Activities in Nepal with Special Emphasis on the Hills. A Study for the World Bank. Environmental Resources Limited, London.
- Ehrlich, P.R. and A.H. Ehrlich. 1990. *The Population Explosion*. New York: Simon and Schuster.

- Fisher, R.J. 1989. Indigenous systems of common property forest management in Nepal. Working Paper No. 18. Honolulu, Hawaii: Environment and Policy Institute, East-West Center.
- Fisher, G. 1993. The population explosion: Where is it leading? *Population and Environment*, 15(2): 139-153.
- Gilmour, D.A. 1988. Not seeing the trees for the forest: A reappraisal of the deforestation crisis in two hill districts of Nepal. *Mountain Research and Development*, 8(4):343-350.
- Gilmour, D.A. and R.J. Fisher. 1991. *Villages, Forests and Forestry: The Philosophy, Process and Practice of Community Forestry in Nepal*. Kathmandu: Sahayogi Press.
- Gilmour, D.A., G.C. King and M. Hobley. 1989. Management of forests for local use in the hills of Nepal. 1: Changing forest management paradigms. *Journal of World Forest Resource and Management*, 4:93-1109.
- Greenwood, N. and J.M.B. Edwards. 1973. *Human Environments and Natural Systems: A Conflict of Dominion*. North Scituate, Massachusetts: Duxbury Press.
- Hardin, G. 1968. Tragedy of the commons. *Science*, 162:1243-1248.
- Hardin, G. 1993. *Living Within Limits*. New York: Oxford University Press.
- Hobbes, T. [1651] 1962. *Leviathan or the Matter, Forme and Power of a Commonwealth Ecclesiasticall and Civil*. Ed. Michael Oakeshott. New York: Macmillan.
- Kiser, L.L. and E. Ostrom. 1982. The Three Worlds of Action: A Methatheoretical Synthesis of Institutional Approaches. In *Strategies of Political Inquiry*, ed. Elinor Ostrom, 179-122. Beverly Hills, California: Sage.
- Krebs, C.J. 1994. *Ecology: The Experimental Analysis of Distribution and Abundance*. Fourth Edition. New York: HarperCollins.
- Low, B. and J. Heinen. 1993. Population, resources and environment: Implications of human behavioral ecology for conservation. *Population and Environment*, 15(1):7-41.
- McGinnis, M. and E. Ostrom. 1992. Design Principles for Local and Global Commons. In *Linking Local and Global Commons*. Proceedings of a conference, eds. Robert Keohane, Michael McGinnis and Elinor Ostrom, 16-65. Bloomington, Indiana: Workshop in Political Theory and Policy Analysis, Indiana University.
- McKay, B.J. and J.M. Acheson, eds. 1987. *The Questions of the Commons: The Culture and Ecology of Communal Resources*. Tucson, Arizona: University of Arizona Press.
- McKean, M. A. 1986. Management of Traditional Common Lands (Iriaichi) in Japan. In *Proceedings of the Conference on Common Property Resource Management*, National Research Council, pp. 533-589. Washington, D.C.: National Academy Press.

- _____. 1992. Successes on the commons: A comparative examination of institutions for common property resource management. *Journal of Theoretical Politics*, 4(3):247-281.
- Messerschmidt, D.A. 1981. Nogar and other traditional forms of cooperation in Nepal: Significance for development. *Human Organization*, 40(1):40-47.
- _____. 1984. Using human resources in natural resource management innovations in Himalayan development. Working Paper 1/1. Kathmandu: International Center for Integrated Mountain Development.
- _____. 1986. People and resources in Nepal: Customary resource management systems of the upper Kali Gandaki. In *Proceedings of International Conference on Common Property Resource Management*. Washington, D.C.: National Academy Press.
- _____. 1987. Conservation and society in Nepal: Traditional forest management and innovative development. In *Lands at Risk in the Third World: Local Level Perspectives*, P.D. Little and M.M. Horowitz, eds. Boulder, Colorado: Westview Press.
- Ness, G., W. Drake, and S. Brechin, eds. 1993. *Population-Environment Dynamics: Ideas and Observations*. Ann Arbor: University of Michigan Press.
- Oakerson, R.J. 1986. A Model for the Analysis of Common Property Problems. In *Proceedings of the Conference on Common Property Resources Management*, National Research Council, 13-30. Washington, D.C.: National Academy Press.
- Odum, E.P. 1963. *Ecology*. New York: Holt, Rinehart and Winston.
- _____. 1983. *Basic Ecology*. Philadelphia: Saunders.
- Ostrom, E. 1986. An agenda for the study of institutions. *Public Choice*, 48:3-25.
- _____. 1987. Institutional Arrangements for Resolving the Commons Dilemma: Some Contending Approaches. In *The Question of the Commons: The Culture and Ecology of Communal Resources*, eds, Bonnie J. McKay and James M. Acheson, 250-265. Tucson, Arizona: The University of Arizona Press.
- _____. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, Massachusetts: Cambridge University Press.
- Ostrom, E., L. Schroeder, and S. Wynne. 1993. *Institutional Incentives and Sustainable Development: Infrastructure Policies and Perspective*. Boulder, Colorado: Westview Press.
- Ostrom, E., R. Gardner, and J. Walker. 1994. Institutional Analysis and Common-Pool Resources. In *Rules, Games, and Common-Pool Resources*, 23-50. Ann Arbor: University of Michigan Press.
- Ostrom, V. 1991. *The Meaning of American Federalism: Constituting a Self-Governing Society*. San Francisco, California: Institute of Contemporary Studies Press.

- _____. 1994. *The Human Condition: Life, Learning, Language, Knowledge, Culture, and the Problem of Order*. Draft paper. Bloomington, Indiana: Workshop in Political Theory and Policy Analysis, Indiana University.
- Ostrom, V., D. Feeny, and H. Picht, eds. 1988. *Rethinking Institutional Analysis and Development: Issues, Alternatives, and Choices*. San Francisco, California: Institute for Contemporary Studies Press.
- Ostrom, V., E. Ostrom and M. McGinnis. 1994. *A Course of Study in Institutional Analysis and Development 1994/95*. Bloomington, Indiana: Workshop in Political Theory and Policy Analysis, Indiana University.
- Searle, J., ed. 1969. *The Distinction Between Brute Facts and Institutional Facts*. In *Speech Acts: An Essay in the Philosophy of Language*, 50-53. New York: Cambridge University Press.
- Pimental, D., R. Harman, M. Pacenza, J. Pecarsky, and M. Pimental. 1994. *Natural resources and an optimal human population*. *Population and Environment*, 15(5):347-369.
- Pradhan, A.S. 1994. *Institutional Arrangements for Community Forestry in Nepal: Towards Self-Governance and Collective Action for Sustainability*. Paper presented at Spring 1994 Mini Conference, Workshop in Political Theory and Policy Analysis, Indiana University, Bloomington, Indiana.
- Tocqueville, A. de. [1835] 1988. *Democracy in America*. Trans. George Lawrence. Perennial Library ed. New York: Harper & Row.
- Wallace, M.B. 1986. *Forest Degradation in Nepal: Institutional Context and Policy Alternatives*. Winrock Research and Planning Paper Series No. 6. Kathmandu: Winrock International.
- The World Bank. 1987. *Nepal: Policies for Improving Growth and Alleviating Poverty*. A World Bank Country Study. Washington, DC: The World Bank.