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## Environmental Policy: The Role of Property Rights and Markets

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# Environmental Policy: The Role of Property Rights and Markets

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by Tracy C. Miller

**T**here is a growing recognition that we need to change our attitudes and practices both individually and collectively toward the environment. Many people have come to recognize the importance of better environmental stewardship. The virtues of a simpler lifestyle, more recycling, protection of endangered species, preservation of natural environments, energy conservation, soil conservation, and reduced pollution are widely recognized. Yet in spite of agreement on some elements of what constitutes good stewardship, we continue to practice lifestyles that violate even the limited standards on which we agree. In addition, a wide range of

government policies and programs to improve environmental stewardship have been implemented, but many have fallen short of expectations, while costs in reduced business productivity, litigation, and government expenditures have been high.

Changes in our thinking as individuals and as a culture, though important, are not enough. Not only do we need to change attitudes about stewardship, we must consider what is necessary to convert good intentions into action. Translating right thinking into right actions requires appropriate institutions and incentives. The study of political economy has much to offer to an understanding of the role that institutions and incentives can play in encouraging better stewardship. An understanding of political economy from a Christian perspective suggests that property rights and market incentives should play a greater role in fostering good environmental stewardship.

A Christian approach to political economy begins with recognizing that human beings are made in God's image, but are sinful by nature. It also emphasizes that Christ's redemption enables individuals and cultures to conform to God's standards for stewardship. This redemption involves more than Christians setting individual examples for the rest of the world to follow. It also includes reforming cultural, political, and economic systems to promote better communal stewardship.

Good environmental policy will include institutions that restrain sin, while at the same time giving human beings opportunities to create ways to be better stewards over the parts of creation that they manage or use. Romans 13 suggests that the role of government is to restrain sin while encouraging righteous behavior. As Christians, we have an op-

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portunity and responsibility to reform government institutions so that God's laws concerning stewardship are more effectively upheld.<sup>1</sup>

### **Problems with Existing Environmental Policy**

Environmental stewardship is complex, and many issues of stewardship cannot be easily categorized as good or evil. Identifying norms for stewardship requires consideration of the consequences of our actions. For example, determining how much waste *may* be dumped into the air or water before there are harmful environmental consequences is difficult. Present and past government policy has often failed because of either a too simplistic or legalistic view of what is good and bad stewardship.

Current government policy toward the environment usually relies on what is known as command and control regulation. Some government agency, such as the Environmental Protection Agency (EPA), decides what needs to be done and then regulates businesses and individuals. This approach assumes an elite group of specialists who possess superior knowledge of what good environmental stewardship is and how it can be achieved (often through either technology or prohibition of certain activities). It also assumes that these government officials will use their knowledge impartially to protect the public interest.

The command and control approach is bound to fail for at least two reasons that can be deduced from a Christian understanding of human nature. First, it fails to account for the fact that well-educated government officials are just as prone to be influenced by sinful motives as the rest of us, particularly when they are in positions of power. As Lord Acton said, "power tends to corrupt, and absolute power corrupts absolutely." Second, the assumption that a small group possesses superior knowledge about stewardship ignores the reality that only God knows the needs, motives, and circumstances that each individual and firm must deal with. As image bearers, everyone has the potential to contribute knowledge about good stewardship within their sphere of influence, but no individual or group of government officials possesses comprehensive knowledge about what each should do.

Numerous examples could be found to show that much environmental policy is driven by self-interest and powerful interest groups rather than impartial

attempts to improve stewardship. One example is provisions of the Clean Air Act concerning emissions from coal fired power plants. Rather than allow utilities to find the most cost effective way to reduce sulfur dioxide emissions, the Clean Air Act requires that they use stackgas scrubbers. A more cost effective and reliable approach would be to switch to low sulfur coal. However, a coalition of eastern coal producers and environmentalists pushed for the use of scrubbers, so that jobs and profits could be preserved in high sulfur coal production.<sup>2</sup>

Even when they have good intentions, the limited knowledge of government officials often improves the environment little considering the costs. For example, the Environmental Protection Agency in specifying the technology that firms must use often inhibits or discourages innovative ideas on the part of those directly responsible for production and consumption. A recent joint study between EPA and Amoco revealed that a refinery could reduce pollution more for \$11 million than for the \$41 million it spent to implement EPA regulations.<sup>3</sup> Numerous studies have found that the conventional approach to controlling pollution required by the EPA costs considerably more than the least costly method of achieving the same level of air quality.<sup>4</sup>

### **The Role of Property Rights**

In light of the high costs and limited results from the command and control approach to environmental policy, a number of conservatives advocate eliminating existing regulations and relying on free markets and voluntary arrangements as was done in the past.<sup>5</sup> The problem with this approach is that property rights have historically favored productive activities at the expense of preserving the environment. Markets and voluntary arrangements do not occur in a vacuum; they occur in the context of a political and legal system that favors certain types of property rights and activities at the expense of others.

Prior to the industrial revolution in England and America, property rights for quiet use and enjoyment were protected against development. A property owner could legally prevent a neighbor from developing or hold him liable for damages if his activity (noise, smoke, blocking the sunlight) harmed his quiet enjoyment.<sup>6</sup> In the 19th century, courts started giving priority to development over other

uses of land. Railroads could emit smoke or noise and were exempted from nuisance lawsuits. Mines were not held liable for polluting water because the resulting economic growth and progress were seen as contributing to the public good.<sup>7</sup> This is the vision of markets, property rights, and freedom to which many conservatives say that we should return. We must reject the idol of progress implied in this vision.

However, those who advocate greater reliance on property rights are correct in seeing the value of property rules for providing incentives to be stewardly. A strong case can be made for property rights and voluntary arrangements through markets for protecting the environment provided that property rules are reformed to value preservation more than progress.

Well-defined property rights should aid in resolving conflicts over how some part of the creation should be used (or preserved). Property rules specify both the rights and obligations of various parties with respect to parts of the creation. Bromley suggests that property rules can be classified into four types. Suppose that there are two property owners, A and B, with B desiring to engage in an activity that will cause harm to A.

1. Under the most familiar type of property rule, if A has a right to enjoy certain environmental amenities, then other parties (B) have a duty not to violate that right without permission.
2. The party who wishes to use the environment for development may do so, but must compensate those who have a property right to enjoy attributes of the environment which are damaged as a result. This is a liability rule.
3. This rule gives B the right to engage in certain types of productive activities regardless of the consequences for others. Those (A) who value the part of the environment that is harmed by B's activity can only prevent such activity by offering payment to B.
4. This rule is also a liability rule, but gives the party who desires to preserve the environment (A) the right to prevent others (B) from destroying the environment. A, however, has the duty to pay B compensation for the loss, as determined by a third party.<sup>8</sup>

Note that these rules can be applied to anything about the environment that people as stewards believe to be valuable. If a natural ecosystem is

recognized as valuable and those who value it undisturbed are granted a property right to it, then a rule like 1 or 4 could be used to protect the ecosystem from harm.

Some might object that property rules, particularly private property rights, treat people as exclusive owners of parts of the creation, when the creation belongs to all creatures. What property rules actually do is identify the people responsible for stewardship of specific parts of creation. Rather than giving people greater discretion, an effective system of property rights is desirable precisely because it limits each person or group's responsibility to the sphere where she is most knowledgeable and

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competent, rather than assuming that everyone is jointly responsible for collective stewardship of all of creation. Ownership does not imply complete freedom on the part of owners to use property as they choose. Any property rights system that is consistent with God's norms will provide owners with considerable discretion in the use of their property, while also including limits which recognize the duty each has toward others and the nonhuman creation.

An effective property rights approach should specify ownership over anything and everything, including those parts of wild nature that are likely to be valued by some for economic development or resource extraction. Specifying who owns or controls such natural areas is the best way to limit access and protect the environment from those who are looking for easy profits in the short run. Owners will at least have an incentive to consider long run values, which with appropriate owners could include the value of preserving wild nature for the sake of God's creatures.

By more carefully defining and enforcing property rights, the government will protect people from environmental damage or at least ensure that they are compensated, while at the same time creating incentives for good stewardship. Firms will try to find ways to reduce environmental damage from

their activities so as to more easily gain permission of surrounding property owners and reduce the compensation that must be paid. This will encourage developing technologies that are more environmentally benign, locating polluters away from population centers, and producing fewer products that damage the environment.

This is not to suggest that voluntary arrangements or compensation can be used to deal with all environmental problems. Some environmental problems may involve so many parties, or such a great a risk of large losses to future generations that the best way to prevent the damages and promote justice and good stewardship is to simply prohibit certain activities. For example, the only way to prevent the dumping of certain kinds of toxic wastes into the environment may be to prohibit production processes that generate those wastes. This is the rationale for prohibiting nuclear power.

### **Role for Voluntary Exchanges and Market Solutions**

Many environmental problems result from not giving sufficient weight to values of stewardship and justice. This includes aesthetic values, the value of natural ecosystems, the needs of future generations, and other values that aren't easily accounted for by current institutions. Political debate about environmental policy often portrays environmental problems as conflicts between competing absolute values of preservation versus development. Allowing for people to resolve environmental problems through markets and voluntary exchange would encourage decision makers to consider the trade-off between "environmental values" and other values associated with economic development and progress. If property rules recognize that property owners have some mixture of environmental and development rights, then voluntary exchange may discourage viewing either progress or preservation of natural environments as always preferable.

*Markets* are uniquely capable of registering and accounting for competing values.<sup>9</sup> *Competition* among buyers and sellers of resources in response to prices leads to resources being allocated to their highest valued use. If the value of preservation exceeds the value of development, then those who wish to preserve the resource will outbid those who wish to develop it. This is illustrated in the case of forest land. In the U.S., Canada, and Sweden,

owners of small private forest lands often choose to preserve their forests when cutting them would be more profitable. Government forest land (except for the limited areas protected as wilderness) is often harvested beyond the point where it is even profitable to do so, resulting in taxpayer subsidies to timber cutting.<sup>10</sup>

An argument in favor of markets is not meant to deny that the existing social order tends to favor both politically and economically those who wish to develop and extract resources over those who recognize the need for greater conservation.<sup>11</sup> The fact that activities requiring exploitation and development of resources have been valued highly in markets in the past does not mean that natural environments and the services that they provide couldn't be valued highly in the future. Why can't the opportunity to enjoy a beautiful view, or the chance to visit a natural ecosystem or merely the knowledge that natural ecosystems exist and are being preserved, perhaps combined with a chance to read about them, be valued highly in the marketplace? With an appropriate definition of property rights and a more widespread attitude of appreciation for the nonhuman creation, other values can compete with and even supersede materialistic values which exploit creation.

Permitting voluntary exchanges may also allow decision makers to solve environmental problems more economically. For example, allowing some firms to sell emission permits to other firms may reduce pollution and costs to firms. Those firms who can eliminate pollution for the lowest cost may want to exceed government standards if they can sell their excess emission rights to firms that cannot afford to meet government emissions standards.<sup>12</sup>

Private ownership is not always the best way to promote justice. There are some resources and environmental amenities that we recognize should be freely accessible to all people regardless of income. In this case, common property arrangements may be more appropriate. This is the justification for public parks and government regulation of hunting, for example. Individualized-private ownership of property is not always the best way to encourage good stewardship either. Although some economists assume a simple dichotomy between private property and common property, with the latter being associated with inadequate incentives to conserve, the world is much more complex than that.<sup>13</sup> Some

cultures rely on informal cooperation to coordinate use of common property resources. For example, people may cooperate with one another in recognizing implicit rights of other users of common forest land, effectively limiting exploitation for mutual benefit.<sup>14</sup> Privatization may fail to respect some of the implicit rights of previous users to food, fuelwood, or medicine. If such a change is perceived as unfair, then cooperation and trust may break down and greater exploitation may result as respect for the rules breaks down. Government enforcement of property rules will not work unless the system of property rights and associated duties toward the environment are widely accepted by the community.

**Role of Government:  
When are Political Solutions  
Preferable to Voluntary Arrangements?**

It could be argued that because market values are subjective and not necessarily consistent with creational norms for stewardship, market solutions should be avoided when dealing with environmental policy. We should not be so quick to reject voluntary exchange in light of the alternatives which are possible. There is no wise, benevolent dictator to whom we can appeal for our stewardly decisions (apart from appeals to God through prayer and searching the Scriptures). The alternative to voluntary arrangements is to have the government decide.

Although government involvement to determine or protect environmental values is sometimes unavoidable, government attempts to correct market failures often make things worse because of inherent weaknesses in the political process, resulting from human depravity. In a market system, stewardly decisions are made by those who own wealth, while in the political system those who have political power are the most influential. Neither wealth nor political power are necessarily associated with wisdom. However, an important consideration that distinguishes different forms of decision making is accountability for the consequences. Even if the decision maker is not wise, greater accountability for the consequences of decision making may limit the ability of fools to be poor stewards of resources.

When political power determines how we allocate resources, there is likely to be less accountability for individual decisions.<sup>15</sup> The reason for this has to do with the nature of the political process. The

individual voter generally cannot expect to influence the outcome in an election. In voting for a representative each voter is voting for a package of policies. Because of this, the benefits of becoming informed about the details of complex policies do not justify the time required. We can hope for voters that will be motivated by moral principles when they choose candidates, but it is too much to expect voters to be able to incur great costs to figure out the real impact of complex government environmental policies. Special interest groups who can potentially receive large per capita benefits from policy have an incentive to organize to fund a lobbying campaign or political advertisements in favor of

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candidates who will support policy that benefits them. For example, a politician may allow timber companies to cut public forests even when the costs to taxpayers exceed the revenue received. Each taxpayer loses a small amount, while each employee of the timber company gets large benefits from this policy. The politician may be inclined to support such a policy in order to gain campaign contributions from logging companies. Profit making firms don't always win through lobbying. Sometimes environmentalists seem to gain the upper hand. However, in either case, policy will tend to reflect the wishes of a vocal and well-financed interest group.

Good stewardship is a problem of "how to secure the best use of resources known to any of the members of society, for ends whose relative importance only those individuals know."<sup>16</sup> Voting, lobbying, and scientific analysis do not reveal the kind of information needed by government officials to make good decisions about complex economic issues. Although voting may reveal the will of the majority of those who vote, it doesn't account for strongly held views of a minority, unless that minority has the resources to lobby on behalf of its interests. Anyone with money can influence market outcomes by decisions of what to buy and sell. Even people with comparatively low incomes, if they are sufficiently numerous, can have a major effect on resource allocation in a market economy.

Government policy tends to reflect the ideology of the party in power and the desires of the most politically powerful interest groups. By contrast, a market system allows for a diversity of approaches to environmental stewardship. Any individual or group can express their view of stewardship through purchase, ownership, and management of property. This should be of particular importance for Christians, since we often hold views that differ from the prevailing wisdom about the environment. Good environmental stewardship and conservation is not always the most politically popular view, but there are numerous examples of how property owners have managed and conserved environmentally sensitive areas where there was not a public consensus to do so. A good example of this is Rosalie Edge, who purchased Hawk Mountain sanctuary in Pennsylvania, which has become an important place for migrating raptors, though she received little support from the Audubon society or state game departments.<sup>17</sup>

Although voluntary arrangements have advantages, sometimes transactions cost too much to enable people to voluntarily resolve conflicts about environmental stewardship. This is often true with pollution caused by many different firms or affecting many different people over a large area. In this case, government must intervene to limit emissions or require compensation.

When government determines compensation for environmental damages or restricts the amount of some environmentally harmful activities, many economists would suggest that the best approach is to try to approximate the price that would be paid or the amount of activity that would be permitted if the affected parties could agree voluntarily in a free market. The problem with this is that market prices reflect the subjective preferences of market participants based on personal likes or dislikes. Sin leads people to place too high a value on some things, such as material possessions, while not valuing other good things as much as they should (worship, the beauty of God's creation). There are norms for valuing things in creation that go beyond usefulness and subjective attitudes.<sup>18</sup> For example, a particular plant or animal species may not be very useful and people may not be willing to pay very much to preserve them. However, because God created them, they have value apart from the subjective decisions of market participants. One possi-

ble advantage of government involvement is that officials can consider creational norms that may be different from marketplace values.

However, there is no guarantee that government officials will be any more likely to consider creational norms than market participants. They may be pressured by politically powerful interest groups, who often seek government assistance to achieve greater profits or other selfish ends. To encourage greater accountability to the general public, environmental policy should be handled by the smallest unit of government that encompasses those affected by the activity being regulated. Competition among different localized units of government will encourage accountability and allow for some differences in preferences and needs.<sup>19</sup> There is already considerable variability in the strictness of environmental regulation between states, and many people and firms choose to locate in states with higher standards of environmental quality even though the cost of living may be higher than elsewhere. As some communities discover more cost effective ways to achieve improved environmental quality, other communities will imitate them or lose population and businesses. If some communities have policies that are too strict and rigid and their standards of living fall significantly, they will seek to find a more cost effective approach to environmental stewardship.

Political decisions by their nature are often biased toward short-term concern for preserving jobs and enhancing material standards of living. This suggests a need for Constitutional rules which limit the ability of people and their elected representatives to vote for policies that harm the environment. If we recognize that certain kinds of environmental destruction violate God's norms for earthkeeping, then it may be necessary to allow or encourage the acquisition of property rights by organizations and institutions (perhaps as small as individual families) who can be trusted to preserve environmental amenities. For example, the water in a river could be owned by fishing organizations, canoeing organizations, and municipal water supply corporations along the river. If such owners had a property right like type 1 above, they could effectively prevent others from polluting the water, except in the unlikely case where upstream polluters could get all the downstream organizations to voluntarily agree to sell their rights to enjoy clean water. Justice

would require that some environmental values be protected even if a majority might vote for polluting the river in order to provide a higher standard of living. At the very least, if some productive activity harms someone's health by polluting, those whose health is damaged should be compensated, as under property rule 2, even if the community votes to allow the production to occur.

### Implications and Summary

Good stewardship in the present and the future may require redefinition of property rights to recognize the value of resources that have been viewed as free in the past, such as clean air, and clean water. For example, it is no longer appropriate to allow farmers almost unlimited freedom to use their land as they choose, using whatever chemicals and doing whatever they wish with their waste products. Because of the harm imposed on the environment, restrictions on chemical use, waste disposal, and limitations on livestock numbers may need to be a part of the duties imposed on those who own farmland. Justice, however, may require compensation for farmers who are denied privileges and rights that they previously possessed.

The current level of environmental stewardship in North America, and most of the rest of the world, falls far short of God's standards. We can significantly improve environmental policy with a combination of changes in property rights, which of necessity must come about by government action, and voluntary arrangements through markets in response to the duties, rights, and privileges associated with property ownership. As much as possible, government's role should be to establish the limits of what property owners may do as individuals or as a group, and enforce those limits where necessary, while allowing broad freedom of property owners to choose the methods of staying within those limits. In some cases, where property rights to environmental amenities are clearly defined and widely accepted by the public, limits can be determined by voluntary agreements between property owners.

Many questions still need to be explored, such as what role the courts should play in resolving environmental property rights conflicts. The courts have played a central role in defining and enforcing property rights in the past. However, it is not

clear that judges are qualified to interpret the complicated scientific information that may be relevant for some environmental conflict resolution.<sup>20</sup> This suggests a continued role for government agencies to support research and peer review of research about the environment.

Although my focus has been on how to structure a good system to encourage environmental stewardship, I am not implying that the right system will result in good stewardship. Changes in attitudes and ideas are needed because prevailing norms and values need to be changed to reflect a stewardship ethic. This means that we cannot continue to pursue goals of material progress and individualistic prosperity regardless of the social and environmental consequences. Without change in collective attitudes and ideas, our political system will not redefine and enforce property rights to reflect the value of natural environments. Without change in individual attitudes of market participants, prices and values will continue to reflect primarily the goals of material progress through exploitation of the environment. What is needed is both a change in prevailing ideas about resources, combined with reforms in our political and economic systems to provide incentives that encourage and constrain behavior in the direction of better stewardship.

### END NOTES

- 1 I am grateful to Delmar Vander Zee for extensive comments on an earlier draft. Jasper Lesage also provided some helpful comments.
- 2 Some other examples of government policies that encourage environmental destruction include U.S. Forest Service policy that subsidizes the cost of timber harvesting in Alaska and parts of the Northern Rockies and farm policy that subsidizes excess production, making it profitable to use more environmentally harmful fertilizers, pesticides, and herbicides to grow the same crop year after year. These and other examples are discussed in Terry L. Anderson and Donald R. Leal, *Free Market Environmentalism*, (San Francisco: Westview Press, 1991). Much forest destruction in less developed countries can be attributed to government policies which subsidize logging or land clearing and much wasted energy is the result of energy subsidies (Frances Cairncross, *Costing the Earth*, Boston: Harvard Business School Press, 1992, 63-88).
- 3 Caleb Solomon, "What Really Pollutes? Study of a Refinery Proves an Eye-Opener," *Wall Street Journal*, March 29, 1993, section A1.
- 4 A variety of empirical studies of controlling air pollution find the conventional command and control approach costs up to 22 times as much as the least expensive alternative for achiev-



ing the same level of ambient air quality. Most studies find significant cost reductions by allocating emission reductions among firms in a more cost effective manner and by allowing firms greater flexibility in choosing the method they use to reduce emissions of specific pollutants. Except for the Los Angeles basin, where large reductions in emissions would be required of all firms to meet existing standards, cost reductions of greater than 43 percent are possible in a number of different geographic areas (Thomas H. Tietenberg, *Emissions Trading*, Washington, D.C.: Resources for the Future, 1985, 41-47).

- 5 For a discussion of the arguments for free market environmentalism see Anderson and Leal (*op. cit.*). Several Christian economists also argue for reliance on free markets and private property rights, though generally recognizing that how property rights are defined also matters. See for example Calvin Beisner, *Prospects for Growth* (Westchester, Illinois: Crossway, 1990) 213-219. Another advocate of property rights and markets is P.J. Hill in "Biblical Principles Applied to a Natural Resources/Environment Policy," in *Biblical Principles and Public Policy* edited by Richard Chewning (Colorado Springs: NavPress, 1991). My views, as discussed in this article, are similar to Hill's on many points.
- 6 Jonathan Hughes, *American Economic History*, (New York: HarperCollins, 1990) 127-28. For a more detailed discussion see Morton J. Horwitz, "The Transformation of the Concept of Property in American Law, 1780-1860," *University of Chicago Law Review* 40 (1973) 248-90.
- 7 Harry N. Scheiber, "Property Law, Expropriation, and Resource Allocation by Government: the United States, 1789-1910," *Journal of Economic History* 33 (March 1973) 232-51.
- 8 This list is taken from Daniel Bromley, *Environment and Economy* (Cambridge: Basil-Blackwell, 1991) 46. He includes a fifth type of property rule in his list which is an outright prohibition of certain activities, regardless of who owns the property.
- 9 Markets will account for the values of anyone who has purchasing power in an economy. Hence this statement is only accurate to the extent that property ownership is widespread. The values of people who lack wealth and income-earning skills will not be considered unless they also receive an adequate amount of income.
- 10 Logging on half of the Forest Service's lands loses about \$100 million per year. Small, private woodlot owners apparently value other uses of the forest like cross country skiing, hunting, and birdwatching. Lawrence Solomon, "Save the Forests—Sell the Trees," *The Wall Street Journal*, August 25, 1989.
- 11 This might seem to imply that scientists in academia have more wisdom concerning stewardship and should be able to dictate to others (particularly wealthy business firms, whose motives we often criticize) how they can be better stewards. Humility suggests that no group can claim to be superior stewards because of education, employment, ownership of wealth, or lack of wealth. Our role in academia is to encourage greater public debate of these issues. All of us can learn together what constitutes better stewardship as we discuss Scripture and its application in light of our respective callings.
- 12 Existing emissions trading systems can be criticized in at least two ways. They may allow a firm in one ecosystem to pollute

excessively, while reducing pollution in another ecosystem. Although the aggregate amount of emissions may be reduced, environmental damage could increase. This suggests that any system to reduce emissions of pollutants should seek to limit pollution within individual ecosystems. It should be noted that because there is no scientific way to establish the boundaries of the relevant ecosystems, somewhat arbitrary decisions will be required. (see Martin W. Lewis in *Green Delusions* (Durham: Duke University Press 1992) 111-14. A related problem is that tradeable emission permits may require a centralized bureaucratic system to administer and enforce. Beisner (218-19) argues that an emissions trading system may be consistent with a biblical view of the state because it "restricts the power of the state to redressing wrongs rather than actually shaping society."

- 13 Although it is easy to find examples where common property regimes, including government control, have resulted in poor stewardship, such results could be attributed to inadequate rules and cultural norms to restrict access and encourage conservation. In some cultures, common property regimes result in good stewardship and conservation of resources (Bromley, 22-23 and 153-56). Elinor Ostrom studied a number of small-scale common property resources located within individual countries, encompassing from 50-15,000 persons each, who are dependent upon the resource for economic returns. Some of the cases she studies suggest that groups can devise effective arrangements for managing and conserving resources they share in common (Elinor Ostrom, *Governing the Commons*. New York: Cambridge University Press, 1990).
- 14 Paul Seabright, "Managing Local Commons: Theoretical Issues in Incentive Design," *Journal of Economic Perspectives* 7 (Fall 1993) 113-34.
- 15 A similar problem is possible when corporations play a major role in resource allocation. Because of limited liability of the owners, there is inadequate accountability for major damages to the environment. The corporation will have a tendency to undervalue the most serious risks associated with its activities, because the personal wealth of the shareholders cannot be used to compensate for harm, nor is there an individual or small group who can be viewed as liable for crimes committed by the corporation. This suggests that one important role for government is to pass regulations to limit the risk taken by corporations, or require the corporations to fully insure against risks. Unfortunately, governments have often acted to protect corporations against risk rather than require them to fully insure. A good example of this is the nuclear power industry, where the Price-Anderson Act places a ceiling on the liability of an individual electric utility company from a nuclear accident. Tom Tietenberg, *Environment and Natural Resource Economics*, 3rd edition (New York: Harper-Collins, 1992) 176-77.
- 16 Friedrich A. Hayek, *Individualism and Economic Order* (Chicago: University of Chicago Press, 1948) 78. This principle could also be applied to groups or communities of individuals. But even in the case of small groups, such as families, much decision making is done by individuals in their respective offices based on their knowledge. The community may establish the goals, but the individuals utilize their knowledge to contribute their input to communal resource stewardship. The point that deserves to be

emphasized is that most of our stewardship decisions are not made as residents of a city, state, or nation; they are made as individuals or members of families, business firms, and other small communities. Hence the market is a very effective way for all the different groups or communities to communicate goals, values, and alternatives to each other through prices.

17 P.J. Hill, "Biblical Principles Applied to a Natural Resources/Environment Policy," *Biblical Principles and Public Policy*.

18 Loren Wilkinson, *Earthkeeping in the 90s: Stewardship of Creation* (Grand Rapids: Eerdmans, 1991) 239.

19 In existing democratic political systems, it may be necessary for larger governmental units to regulate the activities of some large corporations who would otherwise dominate local political decision making by virtue of their size and economic power. For an example of this problem in Gary, Indiana during the 1960s, see Matthew A. Crenson, *The Un-Politics of*

*Air Pollution* (Baltimore: Johns Hopkins Press, 1971). This is unlikely to be a serious problem in the 1990s, because most cities and states are not dominated by one large manufacturing employer, as Gary, Indiana was dominated by U.S. Steel in the 1960s.

20 Judges are most qualified to decide cases where there are well defined principles involved. Judges are not well trained in policy analysis, and the legal system doesn't provide courts with reliable feedback on the effects of their decisions. Hence decisions about how much emission is acceptable and what method of motivating firms to reduce emissions are better left to legislative decision making or voluntary decision making in the marketplace. For further discussion of the limitations of courts in resolving complex policy problems see Peter H. Stuck, "The New Ideology of Tort Law," reprinted in *Scaling the Corporate Wall* by S. Prakash Sethi, Paul Steidlmeier and Cecilia M. Falbe (Englewood Cliffs, NJ: Prentice Hall, 1991) 354-365.