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Achieving Agreement on Natural Resource Use

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Competition, ranging from moderate to severe, is the typical situation for the use of almost all kinds of natural resources. There are many kinds of natural resources, whether they be measured in physical, biological, or economic terms; and they occur in many different locations. In order for the qualities of nature to serve as resources for people, they must be combined with labor, capital, and entrepreneurship. When so combined, the natural resources can be and are used for a wide variety of purposes.

The demand for natural resources grows out of many factors, of which three are of prime importance: population, or the number of persons who might wish to use the resource; income, or the ability of potential users to acquire the resources they want; and technology, or the means whereby the resources can be transformed to meet human needs.

Due in major part to increased magnitude of each of these three basic characteristics, the demand for natural resources in total and for most kinds of natural resources is growing. The growth in demand has varying impacts upon the resources and upon their suppliers. Growing demand, for any goods or services, nearly always produces some problems but it also nearly always provides some opportunities for many persons and groups.

By and large, the growing demands for natural resources in this country and in the world as a whole can be met. No disaster of resource unavailability or even of excessive cost looms on the horizon. Thirty years of intensive research at Resources for the Future has established and reaffirmed this position. So does my careful reading of extensive professional literature. There likely will be problems in natural resource supply but they are problems of magnitudes and kinds which can be met. Doomsayers and prophets of catastrophe have expounded their views from time immemorial but thus far they have been proven wrong. I am convinced that the initiative, intelligence, and effort which have brought the world to its present state of relative wellbeing will be adequate to keep us out of major trouble or to rescue us if we do indeed encounter disasters.

Over the past few centuries, science and technology have reduced the real cost of natural resources for the world as a whole and surely for its economically more advanced countries. Even as demand for resources has grown, the capacity to meet that demand has grown even more. Through the ages there has been an increased availability of natural resources to meet the needs and demands of people. There is no single index to wellbeing of the world more significant than the greatly increased life expectancy of babies at birth - now three times or more that of 300 years ago.

But this growing demand for most or all natural resources does mean increased competition for their use, and this in turn heightens the importance of measures to resolve that competition.

Before I go further, I should emphasize that my discussion this evening relates to privately- as well as to publicly-owned natural resources. Competition for use of the latter often captures the headlines but competition for use of privately-owned resources is no less important and often no less keen. There are legal, political, and other differences between publicly- and privately-owned resources of similar physical characteristics, but the problems of competition for use and the need for conflict resolution are closely similar for each.

The potential uses of natural resources are great in their variety and characteristics; it would take a full-scale report to simply list and briefly describe all the possible uses of the many kinds natural resources, and hence I cannot even attempt to do this tonight. I simply wish to remind you of that great range and variety of uses, and let you fill in the details.

Numerous relationships exist between possible rivals for use of a particular natural resource. Sometimes different uses are wholly compatible and there is essentially no competition between them. Wilderness and watershed use of an area is one example. In other instances, the potential uses are totally incompatible, and any use for one purpose means no use at all for the other purpose. When a tall office building or a shopping center is built, forestry on the same land becomes impossible, for instance. In still other cases, two greatly different uses may exist in reasonable accommodation on the same area. We have all seen pumps extracting oil from fields where crops were grown, for instance. I shall not attempt to list or characterize all possible relationships among potential uses of natural resources but merely wish to remind you that multiplicity of relationships does exist.

Many different kinds of use of natural resources imply many different kinds of natural resource users. Some users make a direct use of the resource, as does a person or group enjoying outdoor recreation. In other cases, the use is indirect of the products or outputs of the natural resource, as a homeowner enjoying the comforts of his or her home in which lumber and other forest products are embodied. The competition among users or

potential users of a natural resource may be in terms of the kind of use - logging versus wilderness, for example - or it may be between persons or groups who wish to make the same or closely similar use of the resource. Every person in the modern world is a user of natural resources in some form and in some way, but some individuals use such resources more directly or in larger quantities than do others. In this sense, everyone is to a degree in competition with anyone else.

Major Avenues for Conflict Resolution

There are three major avenues for resolution of conflicting demands for use of natural resources:

1. The market, where potential buyers and potential sellers meet and compete, and arrive at bargains;
2. Legislation, accompanied by judicial decisions, where rights to use and limitations on use of various natural resources are spelled out in varying detail, and where incentives to encourage certain uses are provided; and
3. Negotiation between the dominant parties or among all parties, resulting in agreements which are then translated more or less completely into action.

Each of these three major avenues for conflict resolution has its particular characteristics; its strengths and virtues; and its limitations. Each operates best under some circumstances and operates poorly or not at all under other circumstances. None is perfect in all situations. In my personal scale of values, there is nothing more desirable about one of these approaches than about either of the others. I view each pragmatically: how well can it operate in a specific situation?

I wish now to examine in some detail each of these three major avenues for conflict resolution, and then to consider the kinds of information and the kinds of analysis needed for any one or any combination of them to work effectively.

Market as a Mechanism for Conflict Resolution

Economists and some others make much of the market as a means of organizing and directing economic and other human activities. A large body of powerful theory has been built up by economists, based on the existence and the operation of markets. One can describe the ideal competitive market

and then consider how far, in practice, actual markets fall short of the ideal.

The ideal competitive market is a place where buyers and sellers meet, either actually with their goods for trade and transfer, or in communication to trade in defined goods which are physically not present. The stock exchange and the grain exchange are examples of markets where trading takes place but where the goods traded are not physically present. Potential buyers and potential sellers agree upon a price and other conditions of exchange, and then a physical exchange actually takes place somewhere at some time, or else they fail to agree and no exchange takes place.

When such a market exists and works perfectly, it has very great strengths and advantages. The supplier or seller receives the highest price for his product that anyone is willing to pay. At the same time, the buyer obtains what he wants at the lowest price possible. When it works this way, the market produces the greatest possible social gain for the community and for the nation. Every productive effort is fully rewarded and every need or want is fully satisfied at the least cost. Over the decades many economists have described the virtues of such competitive markets and there is surely no need to elaborate on them tonight.

The market, when it operates in this ideal way, is impersonal in the sense that the outcome of the process does not depend upon the personalities of the sellers and buyers. Bids are made and accepted or rejected in terms of the product and its desirabilities, not in terms of the personalities of the actors. But this ideal market is humane in the sense that no one is excluded or deprived because of some personal or social trait. Each person is treated fairly, though impersonally.

Before I consider the ways in which markets for natural resources fall short of this ideal competitive market, let me describe briefly some of the conditions that would be necessary if the market were to function ideally. In the first place, there should be reasonably good, though not necessarily perfect, information about the goods or services offered - their characteristics, their quality, their volume, etc. Such information should, ideally, be equally available to all parties in the market. In the second place, there should be many potential buyers and many potential sellers in the market, so that no action by any single individual could have a major effect upon transactions. If one person is not interested to buy at a particular price, perhaps another person will be; and, similarly, if one potential seller is not willing to trade at a particular price, perhaps another will be. In the multiplicity of potential sellers and potential buyers lies the protection against "sweetheart" deals or dishonesty or rigged prices generally.

A third condition for this ideal competitive market is that the seller can deliver and the buyer can accept goods or services of known and defined quality. The seller must be prepared to describe and defend his description

of goods or services offered; the buyer must be prepared to accept these defined goods and services. A fourth and related condition is that freeloaders must be absent or at least of known kinds and numbers. The buyer must have assurance that he will actually receive what he agrees to pay for, and that no third party can intervene to siphon off some of the goods or some of the value. The natural resource may indeed produce some values which are not traded without wrecking transactions, if those values are known and defined. If those values are poorly defined the transaction may go sour.

Merely listing the characteristics of the ideal competitive market suggests, to anyone reasonably familiar with markets for natural resources, some of the ways in which the actuality falls short of the ideal. But let us review those shortcomings a little more fully.

In the first place, the requirement of a large number of potential sellers and a large number of potential buyers is rarely met in actual transactions of natural resource commodities and services. For publicly-owned natural resources, there is but a single seller - the government, whether federal, state, or local. There are typically but a few possible buyers. Numerous studies have been made of stumpage sales from national forests, or of grazing permits on national forests or grazing districts, or of sales of coal or other mineral leases from public land. Merely calling one of these transactions "competitive" does not in the least make it truly competitive. There is oligopsony and oligopoly instead of true competition. The nature of one's rivals, if one considers bidding for stumpage or for a mineral lease, is likely to be as important as, or more important than, the characteristics of the product. While it is possible that something more nearly resembling genuine competition could be stimulated for many public land transactions, in fact true competition is often impossible. Some of us oldtimers judge the naivete of newcomers by their unbridled enthusiasm for competitive disposal of public lands or public resources.

But lack of numbers among either sellers or buyers or both is not unique to public lands, because it exists for private lands also. There are often only a very few potential developers for a tract of land with commercial possibilities, for instance. A home builder may have the choice among only a very few possible development tracts. In all such cases, the small number of parties on each side of the market is as important for private as for publicly-owned natural resources.

In large part, this paucity of sellers and buyers arises out of the locational characteristics of most natural resources. The buyer of wheat on the grain exchange is not constrained by the fact that some wheat comes from South Dakota and some from North Dakota, for instance. But the buyer of a coal lease on federal land does not want just any coal deposit; he wants the tract of land bordering his own. Likewise, the timber processor wants stumpage

not just anywhere on any national forest, but stumpage in the drainage area where he is operating; and so on, for nearly all uses of natural resources. Even the family seeking outdoor recreation wants to go to some specific place, not just to any place anywhere.

The ideal competitive market cannot deal at all, or cannot deal easily, with some commodities or services which are not customarily traded. For instance, water flowing off any area, whether publicly or privately owned, is likely to have a value, especially in the West, but such water is generally not traded, and often legally cannot be traded. The same is true, to almost the same extent, with wildlife. A landowner may charge for the privilege of hunting on his land but he cannot charge for the taking of wild animals. Clean air may have a value but it is most difficult to sell units of clean air. I think we could go a great deal farther in making some outputs of land salable in the market than we have, but even I admit that it would be most difficult to make all natural resource outputs freely traded in open markets. The legal and conceptual difficulties are less severe, in my judgment, than the public attitudes which would have to be overcome if some kinds of products and services were to be placed in the open market. While such attitudes are more common for publicly-owned than for privately-owned natural resources, they are not absent from the latter.

Closely related to this matter of lack of trading of some goods and services in the market is the fact that in many cases neither the buyer nor the seller can guarantee delivery or, to put it differently, can guarantee no unexpected freeloading. The existence of externalities has been widely noted and need not be explored fully here. Some persons make decisions, others bear the consequences or reap the benefits, in each case without bearing the costs. My neighbor's beautiful garden provides me with pleasure at no cost to me, for instance. But many persons are unaware how common and how serious is trespass, or the unauthorized, illegal, and unwanted use of land and other resources by someone other than the owner. In a state where most of the marijuana is grown in trespass on public land, I should not have to dwell long on the seriousness of the trespass problem.

But the greatest limitation of the competitive market for natural resources is that the electorate and the elected representatives simply will not let the market operate. By legislation and in other ways, the operations of the market are severely restrained. Sometimes the restraint is fatal to the operation of any market; sometimes it is onerous but not fatal. Some people, including some economists, talk about "market failure"; generally it is not failure, for the market could produce a result. It is far more accurate to speak of market repudiation - people simply do not wish to accept the result which the market will produce. There is no country in the world today where the market in land is completely free - in every country, limitations of various kinds are placed on a competitive market in land.

While the limitations on markets in natural resources are typically governmentally imposed, as I shall discuss in a few moments, there are other limitations also. Creditors may impose conditions on land use or on mineral development or on other natural resource use. The public may seek to exert its will through publicity - anyone who proposes to tear down a structure for which historic values are claimed will quickly discover that he or she is not free to do exactly what he or she proposed with private property. Society as a whole has asserted, in many ways, some degree of control or at least of influence over the use of natural resources, private as well as public. "Ownership" is coming to mean something different than it once did.

Legislative and Judicial Processes

Dissatisfaction and disillusionment with market processes for resolution of conflicts over natural resource use have led to large-scale reliance on legislative and judicial processes in recent years. A hundred years ago in the United States there were only a few legal and social controls on natural resource use. An owner could do almost anything he or she chose with the resource owned. Beginning with fence laws, weed control laws, and irrigation district laws applicable to rural areas, the movement toward societal control of natural resource use proceeded from the latter 19th Century until the New Deal. Urban planning about the time of World War 1, national forests and national parks, and various forms of incentives for resource use such as roads and research, each involved governmental intervention in an otherwise private economy. In recent years numerous laws about the environment have constrained the use of privately-owned natural resources, while other laws have provided substantial financial incentives to other resource users.

At the best, laws express the public will on some matters. The political contest replaces the market as the arena within which decisions are made. Lobbying replaces price bidding. The decisions in the political arena on one issue may be greatly influenced, if not wholly decided, by political positions and alliances on wholly different issues. In the political arena, as in the market, compromises, alliances, and maneuvers are common.

In the market, dollars compete with dollars. The desires of individuals are weighted according to the economic strength of the contestants. In the political arena legislation is affected by the political strength of the parties, which in the ultimate case rests upon the votes of the electorate. Instead of one dollar equaling one dollar, as in the market, in the political arena one person equals one person. Both dollars and voters can, of course, be manipulated or managed to achieve desired ends. Economic power translates into political power, and vice versa, but only incompletely and often with results different from what one might have expected.

Legislation may affect natural resource use in three different major ways:

(1) by direct public action, as when the government builds a dam or manages forest land; (2) by restrictions on private action, as when the government imposes air quality controls or specifies well-spacing distances upon private oil development; and (3) by subsidies to encourage desired private action, such as crop diversion payments. Each, but especially the latter, may take one or more of numerous specific forms.

Discussion of legislative and judicial action often focuses, upon federal laws and courts, but in fact both states and local, governments employ both legislative and judicial processes to influence if not control private use of privately-owned natural resources. Direct land use controls have traditionally been the, province of cities and counties, for instance. But local governments provide many public services to privately-owned natural resource areas and uses.

If there is legislation, there must be courts to interpret die, laws in specific cases. The courts, at least in theory, provide protection against arbitrary or discriminatory action on the part of public officials and also against aggrandizement by private parties.

In the United States in recent decades the existence of a, problem has nearly always been followed by a demand for governmental action, which in turn requires laws and appropriations. But the enthusiasm for government action is often matched, especially in very recent years, by a desire to "get the government off our backs." Increasingly it is recognized that governmental, action is not a foolproof panacea for all ills.

The legislative-judicial route to resolution of conflicts over, natural resource use has several severe shortcomings:

In the first place, laws and the judicial process are often inflexible and not easily adaptable to individual cases. No matter how carefully and sensitively drawn, laws typically will not fit well in some cases. Both the drafting of laws and the interpretation of laws by the courts have often been insensitive to scientific information. There have been cases in both legislative and judicial processes where decisions were made completely contrary to the best existing scientific information. At their worst, laws in actual application can be arbitrary and even silly.

The adversary process and approach of the courts often does not or cannot consider alternatives other than a decision in favor of one contestant or the other. Typically, one contestant wins and the other loses. Only sometimes are compromises considered, whereby each party would gain something but not everything sought. In many suits, not all parties affected by the decision are represented. In particular, when the decision, whatever it may be, affects the general public to some degree, that general public is typically not a party to the judicial action.

The legislative-judicial process often sacrifices economic efficiency for a distribution of the economic gains desired by the parties with the political power or political initiative. Efficiency is primarily a market concept; equity, or the distribution of gains, is a political concept. What I am able to gain out of any struggle over natural resource use is clearly equity; what you are able to gain at my expense is unfair and unreasonable. Equity or fairness is a slippery matter in practice. The legislators and the courts may strive for it but in the process they are often willing to sacrifice large amounts of efficiency.

The legislative-judicial processes are typically costly, not only in money but also in time and in the use of human talent. At the best, these processes are a substantial economic burden to the populace as a whole. The cost is often intolerable to some parties or to some potential parties to the disputes over natural resource use. The cost of court action may be so high that in actual operation this process is not open to lower-income persons. The courts may be courts of law but not necessarily of justice.

Finally, the results of seeking legislation or judicial decision to decide some conflict over natural resource use are uncertain. It is precisely because there is a difference of opinion about some situation that recourse is had to the courts - if everyone agreed as to the rights of each party, there would be no legal contest. A party to a dispute over natural resource use can never be sure as to the result of the legislative or judicial action. One may not only fail to get what one seeks, but one may wind up worse off than when one began. Even if one wins today, that is no guarantee for tomorrow, in either legislature or court. Changing political, social, economic, and technological times may lead wisely to the overthrow of past decisions. But they may equally lead to unwise new decisions. Uncertainty is particularly great for innovations of any kind. Will a technologically new method of natural resource use be accepted under present or under amended law? One cannot be sure, in advance, yet innovation has been basic to increased wellbeing of people throughout the ages.

For all of these reasons, many persons and groups have become disillusioned with the legislative-judicial approach to the resolution of conflicts over natural resource use. One direction taken in recent years has been direct negotiation among the interested parties, and I now turn to an exploration of this approach.

Direct Negotiation

Direct negotiation between rivals or opponents is at least as old as civilization. Wary about the gains and losses from combat or struggle, the parties at interest have agreed to try to mediate their differences. Typically in the United States in modern times, wage and working-condition

agreements have been negotiated between labor unions and employers. Direct negotiation is used in some situations about natural resource use. A suburban developer buys off opposition to his plans by donation of some land for a public park, for instance. Several rather large-scale and relatively complicated direct negotiations over natural resource problems have taken place in the last couple of decades and one may logically conclude that more such negotiations will occur in the future.

Direct negotiation on issues of natural resource use is likely when every party of interest is reluctant to trust either an unfettered market or a legislative-judicial process. If one feels confident of winning and feels that the costs of a struggle are not excessive in relation to the expected gains, then there is little reason to negotiate with rivals. If success is uncertain or if prospective costs are excessive, then negotiation may be a preferable alternative.

Critical to the success of any negotiation is a willingness and a desire on the part of all parties to genuinely seek a solution. If one or more parties to the competition seeks to prevent any decision of any action, then negotiation is almost sure to fail. Likewise, if one party is confident that its economic or political power will enable it to prevail completely, then negotiation will likely prove unattractive to it. In still other instances, one or more parties to the competition may feel so dedicated to an ideological position that compromise with contending interests is ruled out. If God has revealed his truth to you, why should you compromise with the Devil?

Even if there exists a willingness by all parties to negotiate, a further absolute requisite is the willingness and ability of each party to honor any agreement that may be reached, and the willingness of each to trust the other parties at interest to do the same. Such ability and willingness are all too often missing in negotiations about natural resource use. Negotiation between trusted friends is one thing; negotiation with rivals who are not trusted is very different. But in many instances involving natural resource use, the actual negotiators may have trouble delivering performance by their clients. Most parties have their own constituency to deal with. Examples exist of apparent agreements being repudiated. Contenders for natural resource use can frequently cite instances of other parties welshing on what seemed like confirmed agreements; each is better at citing such actions by rivals than by admitting to similar actions by itself.

Each party to a negotiation must have information or a shrewd guess as to the values each other party places on each aspect of the resource use under negotiation. The essence of the negotiation process is for each party to give up some of what it values least in return for gaining more of what it values most. Although each party must have some concept of the relative values of each other party, each may seek to conceal its own relative values. Ruses of

various sorts, bluffs about possible actions, and plain red herrings are surely to be expected. But, in the end, if success is to be achieved, a large degree of honest bargaining is indispensable.

At its best, the negotiation process produces net gains for each party, and the sum of all such net gains is greater than could be achieved in any other way. Even at this best outcome, it is highly probable that no party gained everything it sought. There is most likely to be some margin of unrealized gain for each. But, again, if the process works at its best, costs have been avoided so that the net gains to each party are higher than if the competition had been resolved in some other way.

Clearly, negotiation, if attempted, will not always proceed to a conclusion accepted by all parties, for any one of the reasons suggested above. Moreover, a negotiated result which seemed satisfactory when first agreed upon may turn sour for one or more parties in the future. But this latter result may also occur with either market competition or legislative-judicial action.

Combinations of Approaches

I have discussed the market approach, the legislative-judicial process, and negotiation as if each were the only method of conflict resolution for natural resource use. In practice, these various approaches are likely to be combined in varying proportions.

For instance, it is common for contending parties to attempt to negotiate the terms of new legislation. In the legislative process, it is always much easier to prevent something being passed and adopted than it is to secure such adoption. The defensive position in the struggle is easier to maintain than is the offensive action. Under these circumstances, it is often necessary to make concessions to some interest group which possesses a degree of political power, if any legislation is to be enacted. Thus, negotiation and legislative approaches may be combined.

It is very common for the legislative-judicial process to set the terms or the conditions under which the market can operate to resolve competition for natural resource use. The market is often better at producing a decision between rival persons for the same defined use of a natural resource, than it is in producing socially acceptable decisions between different kinds of resource use. With all its limitations in practice, the bidding process for sale of timber or minerals from public land may be acceptable, whereas society may be unwilling to allow the decision between wilderness and timber or between wilderness and mineral production to be made in an open market process.

There surely are situations in which a court decision might give legal strength to a negotiated agreement about natural resource use. The judicial process would thus be used to supplement or to replace trust among the parties.

There are other possible combinations of approaches but I do not try to list or describe them all. Whatever may be the single or combination of approaches, there are certain kinds of information and certain kinds of analysis which are indispensable, and I now turn to a description of these.

An Eclectic and Comprehensive Approach Is Essential

Whichever of the three major avenues of conflict resolution may be chosen, the result is likely to be more satisfactory and longer-enduring if it is preceded by an eclectic and comprehensive analysis. Such an analysis is complex and difficult but anything less is almost surely doomed to failure. A comprehensive approach requires several different kinds of information, which almost certainly means an interdisciplinary effort, with all the problems and difficulties of such efforts. Each specialist may have a part of the truth but rarely will he or she have a complete picture. The information of different kinds, from different sources, must somehow be synthesized into a consistent whole, and therein lie many difficult problems.

An eclectic and comprehensive approach to conflict resolution requires each of five different kinds of analyses: (1) physical-biological feasibility and consequences; (2) economic efficiency, or benefits in relation to costs; (3) economic equity, or who gains and who pays; (4) cultural acceptability, or how well proposed solutions conform to social goals and standards; and (5) operational practicality, or the ability to actually carry out the decisions agreed upon. Each of these must be described in a little more detail.

1. Physical-biological feasibility and consequences. In a particular natural resource situation, where there is conflict over the use of the resource, the basic question is: what can be done with this resource? What inputs of labor, capital, and entrepreneurship are required to produce what results? This requires, in physical terms, what an economist calls a production function - so many acres of land, so many hours of labor, so much machinery, so much fertilizer, and so much of other inputs, to produce what amount of goods or services? At this stage of analysis, the cost of the inputs and the value of the outputs are not considered.

It is not enough to consider the first or initial relationship between inputs and outputs; the consequences of some proposed action should be traced through. If one proposes to selectively cut the pines in a mixed pine-hardwood stand, does this mean converting

the stand to all hardwoods? In exploring the consequences of a proposed resource action, it is not satisfactory to compare the probable result with the present situation; the latter is likely to change also, and the real comparison is the situation at some future date, with or without the proposed resource action.

The physical-biological analysis should consider trade-offs, in purely physical terms. If more machinery is employed, at great capital cost, how much does this reduce the labor input? If the inputs are varied on the same resource base to produce different packages of outputs, what is the trade-off between one output and another?

Among the consequences of a proposed action must be included the probable environmental effects. For example, if irrigation is developed in some area, what will be the new river regime, and what will be the environmental impacts? Clearly, the environmental impacts may not be known with certainty, any more than other results of the proposed action can be known with certainty.

2. Economic efficiency. What are the costs and the benefits, in monetary terms, of the various natural resource developments which the physical-biological analysis has identified as possibilities) Frequently, costs are incurred "up front" while benefits are expected to flow in the future. These differences in time dimension can be largely reconciled by discounting future costs and benefits to present values, but this requires the choice of an interest rate - an arbitrary and often contentious process but one which may determine the results of the economic analysis. The economic analysis of a proposed natural resource use must be related carefully to the whole economy and society within which the resource lies. What is appropriate and economical in a rich and intellectually advanced country may be totally inappropriate in a poor and less advanced country.

The economic analysis of costs and benefits may result in a benefit/cost ratio, or in a discounted present net worth, or in an internal rate of return. While the differences among these measures greatly concern economists, basically each measures the same relationship and each is vulnerable to the same forces. Not only is there sensitivity to the interest rate used for discounting, but there are also and unavoidably degrees of risk, of uncertainty, and of probability. But these are inherent in the real world and not a function of the method of analysis.

Both costs and benefits should include environmental effects. If the

proposed resource use involves environmental effects which are generally considered adverse, these effects must be evaluated in monetary terms. Many resource uses do indeed involve environmental consequences which many people will consider adverse; the possibility of favorable environmental consequences must also be considered.

There is a common myth that some kinds of benefits are nonquantifiable in monetary terms. How can you value a beautiful view or a sunset, any more than you can value a mother's love? Those who argue thus are really advocating bad economics rather than good economics and they ignore the fact that by actions, rather than by words, our society does indeed put a value on beautiful views or sunsets, and on mother's love. The next time someone proclaims the impossibility of putting monetary values on certain uses of natural resources, I suggest you use the following procedure with him or her. Offer this person a million acres of wilderness, free, any place he or she chooses; then, when a choice is made, reduce the offer to half a million acres ("haggling over the price"), and see what is excluded. This person will have made two economic analyses and two economic decisions: one for the million acres, a second one for the half million acres. The analysis may have been faulty and may have rested on questionable data, but an economic choice has been made in each case.

I should note that efficiency is a concept valued more highly by economists than by legislators, administrators, and the general public. We economists are concerned, sometimes almost to the exclusion of other considerations, with economic efficiency. Others are more likely to be concerned with economic equity or who gains the benefits and who pays the costs.

3. Economic equity. In most natural resource situations, the persons who bear the costs are not the same persons who gain the benefits, or at least costs and benefits are not shared in the same proportion. The disassociation of costs and benefits may be between different persons or may be between different time periods or both. Contests over natural resource use are typically contests over who gains and who pays. The primary concern for many actors in the process is: what is in it for me? The economic efficiency of a water development or water control project may be low but if I gain much of the benefit and pay little of the costs, it may be highly profitable for me.

The disassociation of costs and benefits applies to environmental results as well as to monetary results of any natural resource use.

Do I value the spotted owls which require a mature unharvested forest stand while you value the deer which thrive better on cutover areas? Should society be more concerned about soil erosion or more pleased with increased agricultural output?

There is no neat test for optimum distribution of economic gains, comparable to the benefit/cost analysis for economic efficiency. Do we as a society wish to levy higher taxes on the relatively rich in order to provide revenues for greater public services to the poor? We say we do, but the results are not very great in this direction. Or might we wish to take away from the poor some of what little they have, in order to enrich the relatively well-to-do segments of the society? The answers lie in the realm of social standards and governmental processes, not in economic analysis. But the economist should make the analyses which show how gains and costs of any proposal will be shared.

just as economic efficiency is a concept most highly valued by economists, so is economic equity most a matter of concern to politicians. They may not have heard of the term or may reject it as a description of their actions but they are acutely conscious of who gains and who pays among their electorate.

4. Cultural acceptability. For some people, biological feasibility, economic efficiency, and economic equity are irrelevant for their position on some natural resource issue. There are some uses which the dominant social culture refuses to permit and others which it will insist upon. For instance, it is generally recognized that natural resource use in India would be very different if Indians generally valued red meat for personal consumption as much as do Americans. But we overlook the fact that in this country we refuse to eat dog meat. Dog meat is eaten in some parts of the world and was eaten by Indians 200 years ago. Lewis and Clark describe their experiences in eating dog meat in what is now Oregon, and Parkman in his book, *The Oregon Trail*, describes the consumption of dog meat by Indians on the Plains. Not only do people in the United States not eat dog meat today, but we refuse to allow it to be used to make pet foods or fertilizers.

Of more importance for use of many natural resources, large numbers of people are opposed to clearcutting of timber or to nuclear power, irrespective of biological consequences, economic efficiency, or economic equity. They are simply opposed and no amount of evidence that nuclear power is the safest source of electrical energy in both the short run and the long, run will change their minds.

Cultural attitudes toward natural resource use are often deep-seated and held with high emotion by those who possess them. These attitudes are likely to be defended as "logical" and "natural" by those holding them, however illogical or esoteric they may appear to others. Moreover, cultural attitudes often do not lend themselves to cool critical analysis. But they exist and the natural resource planner or developer is foolish to ignore them.

5. Operational practicality. Finally, can we, collectively, actually do what we decide we want to do? Not infrequently, a course of natural resource use is proposed which simply cannot be carried out. Many proposals call for expenditure of public funds; there is often a huge gap between what may be authorized and what will actually be appropriated. Particular programs may call for more professional skill in application than is likely to be available. And sometimes such large segments of the total public ignore or violate plans and regulations that the whole scheme becomes impossible. In my scale of values, little is gained and much may be lost by plans or proposals which simply will not or cannot be put into practice.

The foregoing discussion takes up these five different kinds of analysis separately, one by one, primarily for expositional reasons. In fact, there are many trade-offs among them. For instance, if a natural resource use is highly profitable, its profitability will often overcome opposition that is based on cultural reasons. When the new hybrid rices were introduced in Asian areas, in many instances they encountered cultural opposition because the rice tasted differently or cooked up differently than the varieties to which people have been accustomed for generations. But when it was recognized that yields could be doubled from the same inputs of land, water, fertilizer, and labor, many people decided that more of a different rice was a better than less of a familiar one.

A very common trade-off is economic equity for economic efficiency. Maximum economic efficiency means that the gains, to whomsoever they shall accrue, are greater than from any other course of action. Some people will try to obtain a natural resource use which gives them more gains but at the expense of the whole society. In the natural resource field, this has been more prominent and of greater magnitude in the water management and development field than in any other.

While operational practicality is highly important, it is not fixed and immutable but rather can be modified if sufficient effort is exerted. If some line of natural resource use is urgently desired to achieve

particular ends, greater effort may be directed at making the proposal work in practice. This is true whether the goal is economic efficiency, a predetermined distribution of gains, or the satisfaction of cultural concerns.

It should be apparent from the foregoing discussion that each approach requires its own kind of professional expertise and that each will have its own criteria and its own jargon. Each kind of information and each kind of professional approach has its part to play. The real problems arise when any group thinks it has all the answers and refuses or ignores other kinds of analysis and information. Synthesis of highly disparate kinds of information and of analysis is obviously difficult. My position is that it is unavoidable if a truly comprehensive and fully defensible program is to be developed.

My Ideal for Conflict Resolution

Let me conclude by briefly outlining my ideal for conflict resolution.

First of all, I would like to see conflicts over use of natural resources resolved by a well-thought-out process that leads to a carefully considered decision. In practice, this may well include some combination of market, legislative-judicial decision, and negotiation. I do not argue for any rigid combination of these approaches, nor indeed would I exclude using any one of them alone. While I have much respect for market processes, I think they are often inadequate or inappropriate and must be replaced or supplemented by others.

In the second place, I think it essential that every party at interest in a dispute over natural resources recognize and respect the viewpoints of others. In many cases, one or more parties to the conflict feel and act as if all virtue was on their side, and that others could be and should be ignored if possible or pushed aside if necessary.

In the third place, in my ideal conflict resolution, every party would be seeking agreement - agreement most favorable to himself or herself, but nevertheless agreement. A desire to reach agreement is essential because any party determined to prevent or sabotage agreement can usually do so.

For any resolution of conflict over natural resource use to be considered ideal, the total of the public interest must be at a maximum or near it. It is obviously difficult to define and to measure a public interest, as many scholars have pointed out many times. But there is, in my judgment, something that can be considered a totality of public interest, and the effort should be to reach this as closely and as clearly as it can be defined.

The ideal solution to the conflict over natural resource use should yield some gain for every party to the conflict. It is most unlikely that everyone can gain everything that he or she would like. I think that in most cases, everyone must fall short to some degree; but I also think that each party can gain something in a well-chosen solution to a dispute.

Clearly, my ideal, described so briefly and in such general terms, is not a neat and tidy process. It contains no mathematical formula - indeed, it rejects such formulae as being insufficient in themselves. But I think my ideal is both practical of attainment, given the will to seek agreement, and realistic in the sense of being possible to carry out.

Introducing: Marion Clawson



Marion Clawson, our 27th Albright Lecturer, is a distinguished resource economist and public servant who has been active in the field of federal land management policy for more than 50 years.

Dr. Clawson received the B.S. degree in 1926 from the University of Nevada. In 1929 he was awarded the M.S. degree in Agricultural Economics at the same institution. He then joined the Bureau of Agricultural Economics, USDA, and worked as an economist in five different western states from 1929 to 1946 on assignments involving irrigation development in the Columbia Basin and California's Central Valley Project. During this period he undertook and completed additional graduate studies, receiving the Ph.D. in Economics from Harvard University 1943.

In 1947 Dr. Clawson moved to the newly-formed Bureau of Land Management, U.S. Department of Interior, as the Regional Representative in San Francisco. A year later he was appointed as first regular Director, headquartered in Washington, D.C., and served in that capacity for five years until 1953. From 1953 to 1955 he served with the Economic Advisory Staff in Jerusalem, Israel.

In 1955 Dr. Clawson joined Resources for the Future as Director of Land Use and Management Studies. He served in various capacities, including Director of Land and Water Studies, Vice President, and Acting President during his 21 years with Resources for the Future. Following his retirement in 1976 Dr. Clawson continued to work as a consultant to Resources for the Future. He was appointed Senior Fellow Emeritus of RFF in 1981.

Dr. Clawson has conducted research and policy studies relating to the use

and management of federal lands and to outdoor recreation. His publications include: *The Western Range Livestock Industry* (1947); *Uncle Sam's Acres* (1951); *The Federal Lands: Their Use and Management* (1957); *Economics of Outdoor Recreation* (1966); *Report of the President's Panel on Timber and the Environment* (1973); and *The Federal Lands Revisited* (1983).

Dr. Clawson is widely known as a perceptive, highly experienced observer and analyst of the federal land management policy scene. His work is noted for innovation and advocacy. He has been a leader in defining the area of outdoor recreation as a field for original research and policy development. His 1959 article, "Methods of Measuring the Demand for and Value of Outdoor Recreation," led the way for the development of methods for quantifying users' willingness to pay for recreational services based on travel cost data and participation rates. He has argued persuasively for greater use of economic efficiency in managing the National Forest System. He is also a proponent for the continued retention of the federal lands for public management, but has suggested alternative ways, including large-scale, long-term leasing, for improving bureaucratic efficiency and accountability.

Dr. Clawson has held elective office in or been honored by numerous professional or scientific organizations. He served as Vice president of the American Agricultural Economics Association and was elected by it to the rank of Fellow. The association also gave him an award for Publications of Enduring Quality. He served as a member of the President's Advisory Panel on Timber and the Environment from 1971-73, and as President of the Forest History Society in 1980-81. He is a Fellow in the American Academy of Arts and Sciences and a Founding Fellow in the Academy of Leisure Sciences. Dr. Clawson received the American Motors Conservation Award in 1976; the Theodore C. Blegen Award in 1980; and the American Forestry Association Distinguished Service Award in 1982.

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