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CONSERVATION DECISION-MAKING: A RATIONALIZATION

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Looking at the world, and all of the countries and societies in it, one finds that norms of behavior of some kind relative to the treatment and uses of resources are adopted by each. Such norms may appear as religious or social dicta in primitive, static societies. They prescribe how or how not certain crop planting and land-using practices are to be carried out, as well as who is to receive the proceeds of the yields, how fast they may use them and indeed, how individuals and groups are to live relative to their physical environment. In many instances these injunctions are a part of an elaborate mythology, but usually the pragmatic origins are apparent. Given the typically static social, economic, and political attributes of such a society, these "rules of conservation" arise in response to a current or future expectation of undesirable consequences to the society if the "rules" are not followed.

This is likewise true in dynamic, modern market societies such as our own. In our case the edicts are less apt to be religious. Rather, they often appear as complex, changing systems of laws and economic and social incentives. But the reasons are still the same: some individuals and groups, or the whole society, feel that they and their offspring would be disadvantaged in terms of income generated through economic activity and relative to the present and future condition of their physical environment in the out-of-doors, in the absence of economic and social behavioral norms. Conservation then, is the establishment and observation of economically, socially, and politically acceptable norms, standards, patterns, or models of behavior in the use of natural resources by a given society.

In the sense of proscription, that is, the prevention of uninhibited or thoughtless actions considered detrimental to society by individuals or groups, conservation justly receives its name as being *conservative*, but in the best sense of that word.

The very rules and proscriptions of conservation arise initially because individuals and groups in society are not satisfied with the way things are going relative to their present and future incomes of money from the use of resources and of satisfaction from the use of

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the outdoor environment. This is a problem, the emergence of which is the first step toward progress. The reconciliation of this initial dissatisfaction hopefully results in constructive change in the way we may or may not do things of a resource- or environment-conditioning nature. In this sense the initiation of conservation follows the best *liberal* tradition.

Consequently, the general notion of conservation appeals to both conservatives and liberals, the former finding its general appeal more after the fact, in its careful, thoughtful, conservative ways of using resources, the latter more before the fact in the institution of change in the direction of greater general welfare through the institution of conservation policies and practices.

The Soil Conservation Society of America has stated in its philosophy that it is

dedicated to the promotion and advancement of renewable natural resource conservation to the end that water, soil, grass, forests and wildlife, in abundance may be used and enjoyed by mankind forever. The Society is founded on the knowledge and belief that these renewable resources are indispensable to the support and growth of strong, prosperous free nations; that they are interrelated and interdependent—inseparable from one another. . . .¹

Such a general statement of philosophy appeals to both conservatives and liberals, albeit from different avenues of approach! The first of fourteen listed objectives of the society states that these basic objectives shall, in part, be “to promote, advance, and aid continuously the several arts, sciences, and professions that have to do with the conservation of our renewable natural resources in such a manner as to encourage rapid adoption of the best possible system of land management in accordance with the capabilities of the land and with the principle of multiple use.”² The last objective, number fourteen, states the desire “to aid in enlarging the concepts of conservation so they include not only better use of soil, water, grass and wildlife resources in the economy of the world, but aesthetic and human values as well.”³

The society’s philosophy and objectives implicitly make clear that it wishes to maintain conservative practices in the use of resources

1. 8 *Journal of Soil & Water Conservation* 8 (1953).

2. *Ibid.*

3. *Ibid.*

for the benefit of society while searching for ways leading to desirable change in these uses for the same reason. It specifically recognizes the renewable resources as instruments of both economic activity and environmental effect. Additionally, it recognizes the importance of the conservation notion as applied to aesthetic and human values as well.

Perhaps the simplest way to answer the question "why is conservation necessary?" is to say that it is necessary in order to exercise good taste by individuals and groups in the use of resources. Conservation *is* the conscious exercise of good taste in the use of resources. It is caused, on the other hand, because we as individuals have differences in such taste, and because our economic, social, and political institutions are not, and cannot, always be effectively responsive to such complex and, sometimes conflicting preferences.

I

THE CONSERVATION GOAL

The attempt to express our conservation taste or values in renewable resources represents a goal. This goal is concerned with the level of investment⁴ which we maintain in these resources over time, and *how* and *where* they will be organized and managed at any given point in time. The level of investment which is maintained in water, soil, grass, forests, and wildlife determines how much in aggregate flow of yields from these resources, in terms of economic income and environmental income, will be available each year in the future. *How* these resources are organized and managed determines the set of preferences of economic and cultural tastes which will be satisfied, and additionally it determines the efficiency (the absence of "waste") with which the resources are used. *Where* they are developed and maintained and to what degree determines which localities and regions receive the immediate economic and cultural benefits. In a mobile society such as ours the benefits are, of course, diffused and multiplied in many ways in the long-run, but decisions are affected also by short-run considerations.

The fascinating thing about conservation is that the country's preference for the level of investment in renewable resources, and

4. Another way to refer to the level of investment "is to say that the goal of conservation policy is to adjust outputs through time in such a way as to maximize the return from *all* resources at the disposal of Society." Herfindahl, What is Conservation? 6 (Resources for the Future, Inc. Reprint No. 30, 1961).

how and where they are to be organized and developed, changes. Anyone having a static notion of the requirements of conservation in the United States is bound to be frustrated. There is no one mountain of conservation to be climbed, but rather a succession of hills and mountains to be successively conquered, as the history of change in both our preferences for conservation and in changes in conservation technology over the decades have demonstrated. Consequently, conservation presents a dynamic problem as the result of continuing structural changes in our society and the economy.

For convenience, we may distinguish two degrees of dynamism. The first is what may be accounted for in terms of conservation within the structure of given institutions at any point in time. At any given point in time we have expectations of changing taste and preferences for the future and some particular "state of resources" and technology. The problem is one of being most responsive to these preferences, namely, how to use what we have in view of the institutional restrictions, the state of resources and of technology, to achieve the greatest net benefit for society now and in the future, in the eyes of the present generation.

The second degree of dynamism requires changes in or additions to our institutions. Examples of these are the establishment of the Tennessee Valley Authority, the Soil Conservation Service, and the formal adoption of the multiple-use principle by the United States Forest Service. In the first two examples, the question is concerned with whether the expected increase in welfare justifies the new institutions. In the last example, that of the United States Forest Service, the concern is whether sufficient change in taste for recreation and the out-of-doors, as well as enough increase in knowledge of the technology of multiple-use land management, had occurred to justify the change in policy and organization.

The goal of conservation can present issues of a short-term nature which may be resolved within the existing institutional framework of society; or, in the long-term case they may require major institutional changes. It is of critical importance to distinguish between the two and not expect the impossible from given institutions. The resolution of any conservation problem requires a reasoned appraisal of the status of knowledge, cultural institutions, and the present state of the resources in question, relative to the issue which has been raised. The first question is, what will happen if nothing is done? What will be the consequences? The next is, what can be done to resolve the issue within the present institutional frame-

work? If the consequences could be only trivial under this restriction, the third question arises: what institutional changes would be necessary and how could the changes be effected in order that the condition and use of resources can be changed in the direction wanted? Finally, all the costs of possible change, whether monetary or not, either short-term or long, must be weighed against all the benefits in social welfare which could accrue, taking all alternatives into consideration as best we can at this time. The alternative showing the greatest net benefit to cost, in this sense, is best.

The goal of conservation is to achieve the greatest net benefit of monetary and environmental income in the use of resources, all costs, monetary and otherwise considered, and all people considered, giving full attention to the long-run by the present generation. Consequently the ultimate limits to conservation in a democratic society are the limits of its own culture as reflected by the conservation elite.

Like all major goals, the goal of conservation is one which only can be approached; it is something toward which we move. First, the value-preference content of the goal changes in emphasis and character as society changes over time. Second, the conflicting demands of a heterogeneous society would require continual refinement of policies and programs even if value preferences did not change.

The individual's awareness of conservation values to himself and to other members of society affects his behavior within the limits of the mores of his group. In the case of the individual landed proprietor, such as a farmer, this behavior is further affected in the use of resources by the incentives of the market and its associated institutions, as well as the several local, state, and federal conservation incentive programs which may be open to him. The vicissitudes of the market alone, over time, condition how he can organize and use resources, as do the availability of credit and technical information.

However, most people do not fall into this category, hence their direct effect on the use of resources is far less, principally only in how they maintain the land of dwelling properties and in their behavior toward the outdoor environment while engaging in recreation. The effect of most people is mainly indirect, through the ballot box, in influencing laws and legislation governing conservation programs.

In contradistinction to small, individual land-holding proprietor-

ships, the large land-owning corporation is in an entirely different position in terms of capability to single-handedly achieve important conservation measures on its own lands. While it must within reason be responsive to simple, short-term market incentives which are not directly responsive to conservation, the corporation's organization and command of expertise, capital, and credit permit it to engage in consistent long-term conservation policies on its own lands, as well as maintaining incentive programs for other landowners, if it wishes. Many corporations do so for one or more of three reasons: (1) to maintain long-term resource availability, (2) to better their public relations and "corporate image", and (3) certainly to some degree, simply because of social conscience.

Aside from individuals and individual firms and their trade organizations, there are the other major non-governmental groups in society. These may be fraternal, social, religious, or professional. Many of the large ones, such as the major national unions, have definite conservation policies and some have professional lobbyists who attempt to influence legislation toward the areas of conservation which concern them most.

The remaining conservation entity is government itself, at the municipal, state, and federal levels. State and local governments tend to be responsive to local and regional differences in conservation preferences while the federal government tends to respond to both regional and country-wide preferences. While some of the major agencies of the federal government, such as the Soil Conservation Service, Corps of Engineers, and United States Forest Service have, to some degree on their own volition, maintained long-standing conservation policies, the American civil service has not generally exhibited control of conservation policy over major time periods as has been the case in Germany, France, and England. Rather, the American civil service has tended to be highly responsive to voter wishes as reflected through elected representatives and commissions. This is likewise true of the several quasi-governments such as the Tennessee Valley Authority, other river valley authorities, and regional and state compacts.

This brief sketch illustrates how a democratic society with a mixed economy and non-centralized social institutions approaches the goal of conservation. It approaches the goal of conservation in very much the same way as it does in attempting to obtain the most welfare in any other area of interest, through a multitude of indi-

vidual and group pressures in the socio-political system as conditioned by market demands.

And yet there are elites who have a disproportionate effect in approaching the goal of conservation, as again, is the case elsewhere in society. There is an elite of otherwise ordinary individuals, those who are aware and consider their behavior relative to the goal and values of conservation and who behave accordingly. Obviously, their behavior affects others, however subtly. Then there is the elite comprised of individual land owners, including farmers, whose consideration of conservation has direct effects on the very large amount of land which, in total, they control. There is the similarly important elite of the large land-owning corporations: the boards of directors who set policies, and the relevant professional employees, the land managers, soil and crop scientists and foresters who directly administer these lands.

There is the somewhat heterogeneous conservation elite of the various fraternal, social, religious, and professional groups. These are the "moving lights" of conservation and of perception generally, in these organizations. They may or may not be officers or direct employees of the organizations concerned, but they do interest themselves in the values of conservation and the attainment of its goal, and they influence others through their activity in the group.

Perhaps the largest conservation elite is that associated with governments. These are the legislators, policy-framers, and again, the land administering and managing professionals, including the large corps of extension personnel who influence conservation policies and practices on much non-government land.

There are two more elites which perhaps bear mentioning; these are the elites comprised of educators, at all levels, and those who control the various communications media. Educators are charged with the obligation to pass formal knowledge, including an understanding of the culture of the society, on to succeeding generations. This includes our notions of the uses of resources and how the most satisfaction for the populace through all of our endeavors, including conservation, may be approached. Newspapers, television, and radio similarly illuminate broad issues of conservation through their editorial and documentary presentations.

The goal of conservation is approached through the varied influence of millions of individuals, but especially through the elites of

conservation. The basis of approach is the complex of feelings and attitudes of individuals, the development and implementation of formal and informal policies of businesses, organizations, and governments, the multiplicity of land management techniques, and the quality of teaching, curriculum design, and research.

Thus, while the general goal of conservation may be stated singularly, the avenues of approach to it are anything but monolithic!

II

CHARACTERISTICS OF THE DECISION-MAKING PROCESS

The purpose of decision-making is to permit individuals or groups to perform acts which will have predictable consequences to other individuals and groups. The assumptions are that the decision-maker has the authority to do so within the context of policy and organization concerned, that he has criteria of desirability and undesirability, that operationally useful goals have been established, that the decision-making process is effective and efficient in appraising alternatives, and that decisions can, in fact, be carried out.

In most situations the general purpose is fairly well understood. However, criteria of desirability for use in appraising situations are sometimes hazy, ill-understood and the variables concerned are difficult to measure. Operational goals and policy statements are frequently subject to similar shortcomings. In some instances policy may be left vague, deliberately or unconsciously, to avoid the possibility of accurately fixing responsibility for undesirable outcomes. The process or model of relations to be used in appraising alternatives is sometimes entirely wanting, in any formal sense. Frequently it omits consideration of uncertainty. In some cases the supporting staff members are too few or they are inadequately trained, and decision-makers themselves may lack desirable knowledge.

These are some of the more typical shortcomings in the decision-making context, that is, some of the only partially met or unaccounted for necessary assumptions.

No matter how effective a person or a group is in decision-making per se, unmet prerequisites of the function can lead only to crude, and often wrong decisions—let alone to ulcers for the unfortunate decision-maker! In highly fluid situations, as in dynamic cases requiring new or changed institutions, the assumed requirements for decision-making may be hard to completely fulfill in each instance.

Nonetheless, a clear notion of the formal requirements is most helpful.

The limits within which a decision-maker can and should act determine the power at his disposal. Consequently, the scope requires careful delineation in as many dimensions as are necessary. There are limits prescribed by the *kind* of decision a decision-maker or group may entertain, as well as those which encompass the extent of *effect* of his decisions, both quantitatively and qualitatively.

Given that the limits to the particular decision making context are well defined, one may consider systematic methods for appraisal of the various kinds and extents of decisions which are likely. The rational models, processes, or tests used to evaluate alternatives may be highly sophisticated and involve advanced mathematical structures which describe the situation and require ready use of electronic computers; or they may range all the way down to a simple verbal statement of how the decision-maker or decision-making group believes the system behaves within which he or the group operates. Obviously, the degree of sophistication will depend on the complexity of the typical alternatives to be appraised, their importance, and the budget available for the purpose.

But in any case, information, usually in the form of numerical data, will be required to "feed" the models or appraising processes. The information which is to be systematically collected and refined over time is, of course, determined by the requirements of the models used to analyze alternatives. Loosely conceived, ill-designed models soon show up in their almost unlimited demand for information, which is usually expensive to collect and to maintain consistently. One of the useful things stemming from information design is that it forces those concerned to consider very carefully the numerous alternative decision-making circumstances which may arise. The data collection and storage system can be designed to allow for new information to be added in the future, but that does not help much at the time a decision has to be made and the required historical data are not available!

However, even with the exercise of all due care, most decisions will have to be made on the basis of limited information; not all of the ideally desirable information is ever available for complex decisions such as those involved in conservation. It may be limited due to cost, difficulty of measurement, or simply lack of knowledge as to how to conceptualize and obtain it. But some information is always better than none, and when adequately accounted for in the

analytical models, the ill effects of the absence of certain information can be, to some degree at least, minimized. Clearly, there will always be plenty of room for the exercise of good judgment by the decision-maker or the decision-making group. The point of the models and the information is to reduce to a minimum the area of uncertainty confronting them.

Uncertainty is ultimately the greatest hindrance to conservation decision-making, since one is frequently concerned with information and notions which are imprecise, and where their effects far into the future in the form of forecasts typically, are needed.

While no major break-throughs in reducing uncertainty in decision-making have been made recently, modern "decision-making" models from the fields of economics and business, which in part account for uncertainty, may be helpful. These are really only decision-assisting devices to be used by attaching probabilities to consequences of given possible alternative acts or decisions, before the commitment is actually made.

Once the decision has been made, there remains the need to communicate it effectively to those concerned and to insure that it is carried out. Especially in an area such as conservation, where subtle values often are involved in a complex framework of management and technology, a full description of how and why the decision was made, in addition to a presentation of the ramifications of its expected influence, is desirable. Too often the receivers of decisions are not clearly informed of the meaning of the decision, which results in inefficiency, no matter the care and time taken in arriving at the decision initially.

Assuming that the import of decisions is understood there are still many possibilities of their miscarriage. As a final check against this, decision-makers should have an adequate feed-back of the impact and results of their decisions throughout the area of influence of the decision.

Finally, knowledge is required of decision-makers or decision-making groups. Obviously they must have a clear understanding of the goals, policies, decision-making methods, and in general of the responsibilities of their positions. An understanding of the administrative-management function as a whole is also required, as is knowledge of the limitations of organization, structure, function, and staffing.

In some situations, given an individual of acceptable personality,

or a working decision-making group, it may be argued that qualities such as these are all that are really necessary. However, in most instances in conservation, the decision-maker or group should understand two further fields of knowledge. One of these is a first-hand understanding or feeling for the various individual and social forms of value which conservation offers, tied to an intimate understanding of how these values interact with other goals and values of society. The other is a considerable competency in the technology of conservation and the methods of appraising its socio-economic values. This is not to say that specialized staff members can be displaced; rather, that the decision-maker or group understands their functions and criteria of conservation technology and values well enough to recognize from first-hand knowledge what is actually transpiring before and after decisions are made, with their aid.

Taken together, administrative decision-making knowledge, backed by a sensitive appreciation of values, an intimate knowledge of the technology of conservation, and the methods of evaluating its effects, would seem to make for a satisfactory conservation decision-maker or group.

In summary, a decision is an act by an individual or group which will have predictable consequences to others. The prerequisites to successful decision making are that the decision-maker or group have adequate authority and understand the goals, policies and limits of the decision-making context. To the degree feasible, the decision-making system should embody rational models and methods for weighing alternatives, and adequate information must be supplied on a sustained basis for this purpose, recognizing that limited information situations will still be typical. The effects of uncertainty should be reduced by incorporating modern probability decision-making models into the system, where they are practicable. The meaning of decisions should be communicated fully to those concerned and the decision-maker or group should employ a feedback system of information to appraise the ultimate effectiveness of decisions. The staff should be adequate in quantity and quality to fulfill the foregoing obligations. The decision-maker should be educated to the administrative-decision-making function, understand the individual and social values of conservation, and have competency in conservation technology and methods of appraising conservation's socio-economic values.

III A RATIONALIZED STRUCTURE AND PHILOSOPHY FOR CONSERVATION DECISIONS

In previously considering the goal of conservation, which is subscribed to by everyone in some degree, there were identified a number of decision-makers: individuals and many groups, which are represented particularly by their conservation elites, each of whom has some direct or indirect influence over conservation. In the use of resources, in this case the use of water, soil, grass, forests, and wildlife, these individuals and groups tend to have widely differing preferences for conservation, which leads to conflict, to opposition of one to the other. The reasons are clear.

Each individual and group, quite justifiably, has a somewhat different view of the future, of the yields which should be produced, and the uncertainties involved. Consequently, individuals, groups, and organizations, including businesses and governments, responding as they do to differing incentives and expectations, have differing time preferences as to the allocation of our output into investment or consumption, and if into investment, as to how much into resource conservation's various components.

Conflict arises similarly with respect to how renewable resources are to be organized and managed. These decisions fix to some considerable degree how much of which yields from natural resources are to be forthcoming in future years, and the efficiency with which they will be produced. Both economic activity and environment will thereby be affected.

For example, we may have the alternative of a multiple-use land project producing outdoor recreation, forage for cattle, pulpwood and saw timber; or a single-use wilderness area, each of which will yield its expected flows of values at differing times and intensities in the future.

Also tied to the how of conservation investment in a controversial manner, are the two major questions concerning productive efficiency, namely, the technology, and the scale of organization and management to be adopted. In any given case, is a technology based on multiple-use land management output control, which at the same time observes ecological considerations, better than one of single-use, based on, "natural" or random yields aided by little manipulation in some cases, and highly controlled cultural practices in others? And how large should the unit be? Clearly many of the

very small ownerships suffer great inefficiencies, yet there is little agreement as to the size they should assume, and less still as to how to "block them up" into viable units subject to consistent policy and decision-making over time.

Where to locate areas of conservation and renewable resources investment correspondingly raises disagreement. In part the answer to this question will depend on availability and potential land productivities in various areas, and in part on their location relative to potential users, bearing in mind that locations with pleasant living environments are likely to be those in which the bulk of the population will both wish to, and be able to, reside in the future. However, once again the various individuals and groups in society will continue to disagree about location because those with local ties may tend to gain or lose to some extent depending on where conservation development occurs.

Associated closely with the issues just raised is the contentious one of the ownership of land and renewable resources. Public or private, institutional or business, large or small—these ownership qualities tend to limit the degrees and kinds of conservation yields and uses of land in accordance with the owner's conservation yield preference, and limitations of financing, technical ability, scale and time preference. Small woodland owners and farmers find it difficult to apply many conservation inputs to their woodlands even in view of public and private industry incentive programs. Many large land-owning industries practice multiple-use land management and make their lands available to the public for recreation, hunting, fishing, and even scientific purposes, but others do not, responding only to market values. Some government agencies which control public lands practice planned multiple-use land management; others adhere strictly to single use; some have done little at all with their lands; and some lands probably deserve nothing more than identification at the present time.

These results of resource ownership patterns are not used to suggest, however, that some considerable variation in conservation outcome is not desirable in a changing society facing a good deal of uncertainty. The conflict arises not because we have not achieved a single conservation preference, technology, and management intensity for everything. Rather, it arises because we are arriving at outcomes such as those mentioned, by means which are not as sensitive, responsible and rational as we think they should be.

Turning again to the characteristics of the decision-making

process, it is clear that more attention to its criteria, backed by indicated research, could lead to more improvement in the understanding and execution of conservation decisions. Conflict could be reduced considerably, were all decision-makers and groups to observe the limitations of their decision-making contexts, develop more comprehensive appraisal systems, collect more relevant information, recognize uncertainty and attempt to deal with it more objectively; communicate decisions and check on their implementation; and see that conservation decision-makers and decision-making groups, especially the conservation elites, were themselves better educated for the task. This kind of concerted effort, tied to greater understanding of the conservation conflict would provide a better rationale for conservation decisions. But its effect, and even its need, would not be nearly as great as it should be until we recognize the importance of changing the conservation decision-making context itself.

Conservation decision-making must fairly reconcile divergent opinions and preferences of individuals and groups into viable policies which are best for the public welfare, as is the obligation of any political-economic process. The chief criterion for doing this is that, to the extent possible, all concerned in such decisions be made aware of the costs or losses of any kind as well as all the benefits involved in coming to a decision, and that they consistently have a proportionate representation in making the decision.⁵ This means that all those who tend to gain or lose would always be represented in any instance of conservation decision-making. This would in turn lead to more need and justification for the better decision-making methods previously discussed. It would also require a better vehicle for the process, that is, a better organization and structure to serve conservationists in resolving conflicts, as well as more consistently applied criteria of reconciliation based on an adequate philosophy of equity or fairness.

Presently we have a great many groups participating in conservation decisions: governments at several levels, individuals, industry, labor, and various other groups noted earlier, particularly the Soil Conservation Service, the Federal State Extension Service, and the like. However, when we consider the whole country and the

5. That is, broadly taken, services and costs should be made "specific" to the decision-makers, in the sense of having all those to whom services and costs relate take part in the decision. See Scott, *Natural Resources: The Economics of Conservation* 4 (1955), for further usage.

multitude of individual conservation decisions which are made (even by ignoring them) at all levels of decentralization, we do not have a commensurate organization and structure for doing so as sensitively, responsibly, and rationally as we should. The system of soil conservation districts has been a step in this direction and their results are indeed to be admired, but such a system is not comprehensive. A thorough analysis of the kinds of conservation decisions to be made locally or regionally where only certain groups would be mainly affected, as well as nationally where everyone is affected, should be conducted to see the kinds of organization required and the structures necessary to fairly represent all concerned in all decisions. A stable framework in a decision-making organization should be developed cooperatively by governmental and private groups because of their joint interest for the public and the future of the country. Given access to adequate staff services, responsible memberships, and reasonable understanding of conservation and decision-making, such an organization could be structured to respond as sensitively and rationally as we are capable, if criteria for maximizing the public good are observed to the extent possible.

While the variables concerned are often difficult to measure accurately, the criteria for maximizing the public good seem particularly applicable in conservation decision-making in a pluralistic society. They are not new, but perhaps they bear specification.

The first of these criteria is the rather self-evident proposition that a decision should be taken if it will increase the income or satisfaction of some people without causing a significant cost or decreasing the satisfaction of others; obviously the public good would be, on balance, increased. Just as obviously, these opportunities are not too common; but they do appear, especially when sought.

The second situation exists where some people would receive more income or satisfaction while others would lose, if a given decision were made. This, of course, is the most common situation. Since it is impossible for one person or group to measure another's gain or loss especially when part of the gain or loss is not directly monetary, the principle of compensation must be used. The criterion is that those who gain pay the losses of those who lose—to the point where the losers are satisfied that they are no worse off than they would have been, had the decision not been made. Provided this is acceptable to the parties concerned, be they individuals, businesses, other groups, or governments representing society, once again the public good is increased. But there must be organization,

structure, and channels for carrying out these conservation compensations. We have used this principle extensively in the past through many of the federal-state conservation programs. In this instance conservation payments are made by society to individuals for their decision to apply certain conservation investments to land. But the principle would seem to have many more opportunities to operate usefully, given adequate structure, institutions, and channels.

In a flourishing (full-employment) economy it is impossible to use the compensation principle as between generations in making conservation decisions. This is because "compensation to a present generation for a greater level of conservation [for the use of a future generation] can be made only through the use of the very resources which are otherwise to be conserved."⁶ Consequently, the optimum level of conservation investment as between generations is what each generation believes it should be. Once again the need is clear for better organization and structure to permit these beliefs to take active form.

CONCLUSION

We should not underestimate the magnitude and implications of conservation. One often tends to think of its requirements only in terms of his "own" resource of grass or soil or whatever, and often only on a local basis, hence these requirements do not seem to be so great. But in the aggregate, the effects of these requirements are great, representing as they do millions and perhaps billions of dollars annually in the way we use natural resources. And these effects have further multiple reactions throughout the whole economy and society, quite outside what we generally think of literally as conservation. In this sense conservation decision-making deserves a great deal more effort and care than we have given it. Ultimately, conservation is like the process of education. The obligation of education is to pass along the culture of our society to each generation, while trying to change it for the better through scholarship and research. The obligation of conservation is to pass along resource potential to those in the future, while trying to raise that potential through research in conservation values, technology, organization, and decision-making.

6. Heady, *Economics of Agricultural Production and Resource Use* 778 (1952).