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PROCEEDINGS

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Samuel H. Logan, Editor

NATURAL RESOURCES AND THE ENVIRONMENT: DISCUSSION

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Of the three papers which I reviewed, Professor Ditwiler's caused me the most frustration. I had to read it several times before the main message came through and when it did, I was disturbed because it attacked some of my biases. Professor Ditwiler and I are not at opposite poles in our thinking, but we have considerable different shades of gray. I agree that the economic model cannot be used by itself for making land management decisions, but I cannot agree with the statement "Economics can and should be used to help rationalize the compromises generated by the political process." I do not believe we should or need to leave public land decisions to the whims of interest groups that represent past justification for today's institutional structures. As social scientists, I feel we have an obligation to encourage more equitable public land decisions. As indicated in the paper, certain legitimate interests are not fully represented in the political process and I feel it is our responsibility to articulate these interests to the extent we are able.

Professor Ditwiler states that "A model that conceives resource planning as an abstract process involving first a rational determination of what is to be done and second a determination of how to do it most efficiently is not directly applicable." If it isn't, I feel we are in serious trouble. A well-developed economic analysis should be one of the main inputs into the decision-making process. A good example of what I am trying to say exists at the present time in Arizona. The political leaders in Arizona have decided that the Central Arizona Project should be constructed which would bring water from the Colorado River to central Arizona. An economic analysis by Young and Martin in the 1967 Arizona Review has shown that the project is not economically feasible. Does this mean that as an economist I should attempt to rationalize the compromises generated by the political process? I can't accept that. However, if the decision is a reality, the economist shouldn't be a sorehead and refuse to aid in doing a stated job in the most efficient way.

Another statement that bothered me in this paper was "That the broker rule is generally accepted as being the best description of present day politics." Not being familiar with present day political theories, I read an article in Politica by Fred R. Dallmayer entitled "Empirical Political Theory and the Image of Man." In that article, Dallmayer discussed the strengths and shortcomings of present political theories. It was obvious from his discussion of the literature that there was not general acceptance of any given philosophy.

Although I disagree with some of the conclusions in this paper, I found it very thought-provoking. When economic theories are attacked, we should be ready to defend them with legitimate arguments or make modifications in our theories.

Linear Programming For Multiple-Use Management

Last year at Squaw Valley, Professor Herbert Snyder presented a paper entitled "Economic Issues in Public Land Management in the West" where he suggested that economic and programming principles can be applied more rigorously to resource management problems. Kaiser and Putnam have given us a good example on how this task can be accomplished. Traditionally, range economic studies have been narrow in a geographic sense and assumed that other outputs and uses were left unaffected. This study was national in scope and the analytical framework allowed consideration for several other outputs and uses.

An area where the paper could have been more complete is in answering the second stated objective -- "What is the best combination of land management and treatment practices?" To answer this objective, there needs to be a recognition of tradeoff criteria. Incremental changes in output of herbage, water, and wood production can be measured in monetary terms because they are inputs into products that are generally sold in the market place. Recreation can be expressed as willingness to pay and the remaining outputs and uses in the strongest qualitative terms possible. Several effects will still have to be expressed as goals or constraints, but to the extent possible, value-determined outputs should be evaluated in terms of their expressed need.

How outputs are expressed becomes important when value is considered as an integral part of the analytical model. For example, by expressing herbage utilization only as animal unit months (AUM), significant non-monetary considerations are not taken into account.

Smith and Martin reported in the 1972 Journal of Agricultural Economics that "non-monetary outputs of ranch ownership are the most significant factors in explaining high sale prices of Arizona ranches."

Another comparison of interest would be the per-unit cost of grazing cattle on public lands and per-unit cost of other ways of raising and feeding cattle such as feedlots. If these other alternatives turn out to be more efficient or have the potential of being more efficient, there could be considerable implication for the future of public land management. In general the paper summarizes the Forest-Range Environment study very well. The only obvious problem was that by keeping the paper short considerable detail is not discussed. For example, it would be interesting to know more about the prediction models used for the outputs and uses considered.

Conceptual Economic Issues in Conserving The California Condor

I found in reading this paper a refreshing discussion of the critical questions that need to be answered when facing an environmental-economic conflict situation. This association should encourage -- as they have done in this case -- a presentation of the conceptual framework before the actual study is conducted. This exposure allows for critical review by professional peers and could save the researcher considerable time.

In general, I agree with the conceptual framework of analysis put forth in Bishop's paper. Points of differences are either editorial or interpretive. In the first paragraph the author states that "This paper shows that the social costs of efforts to save the condor must play a central role in evaluating alternative policies affecting the bird." The empirical data are not evaluated in this paper, only the conceptual framework so the word "show" should be changed to "argues" or "suggests". In the third paragraph on page three, the author states that "It is impossible to say what the condor is worth today relative to other goods and services and who can say what it will be worth in years to come." I believe we need to have a more positive attitude than this. For example, progress has been in identifying tradeoff criteria for outdoor recreation. I would agree that the value of conserving the condor cannot be expressed in monetary terms, but possibly a more basic index could be developed such as utils of satisfaction which we all learned in consumer theory. I know that economists have been frustrated with this problem since the profession was established, but I believe it is a goal we should continue to pursue.

The conclusion that an alternate cost approach is a practical method of measuring benefits foregone for environmental concerns such as conservation of the California condor is probably valid when looking at each individual case, but when all environmental concerns are considered together, the effect on one or a combination of market related outputs could be significant. For example, protection of the condor, new wilderness areas, halt in clear-cutting, and halt in road construction in roadless timbered areas of the National Forests could have a significant impact on the cost of stumpage. The resulting increase in the price of lumber could reverberate throughout the building industry and cause a new relative price level to be established over the long run.

NATURAL RESOURCES AND THE ENVIRONMENT: DISCUSSION

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Alternative Insecticide Strategies

The paper by Thad Horne and Dan Badger is particularly relevant to the environmental questions facing agriculture today. More studies of this type are urgently needed. A very good start has been made, but considerable additional work is required.

On the regional level, economists are often concerned with aggregate production, hence the authors chose to use the maintenance of production as the objective in order to see the impact of the restriction of insecticide use upon the demand for other inputs. Even though, at the time of this writing, cotton farmers are experiencing a very favorable demand situation, historically, cotton has been one of the most troublesome surplus crops. There is little indication that this situation will change in the long run. Thus, a more relevant objective in the analysis might have been maintenance of level of income rather than level of production. After all, we should be most concerned with the effects of changes upon people rather than resources when faced with a surplus commodity situation.

If restricted insecticide use would cause farmers to expand the acreage of cotton they would need to plant in order to maintain a certain aggregate production of cotton for the Nation, acreage controls could be relaxed or completely abandoned. This effect should be considered. The resulting price effects should also be investigated, especially the competitive position with synthetics, as well as the environmental implications of additional resource requirements. The authors have taken a commendable first step down a path which I personally hope they will continue to travel.

Multiple Uses of Water

Presently, there appears to be considerable opposition in any interbasin transfers of water or movement of water from one river to another. An underlying feeling exists among many persons that there is something morally wrong with the unnatural movement of water supplies. This feeling is readily evident in Colorado where the eastern slope water users are using water from the western slope of the Rockies. This feeling apparently exists in the area surrounding the Newlands Project.

I am pleased to see this effort at valuing the multiple use of water. As a farm boy from an old Bureau of Reclamation project, I was gratified to see agriculture win over recreation. The analysis is very timely as controversies in this project are running quite high between the agriculturalists and the recreationists. It would have been instructive if the analysis could also have included the adverse impacts of the continual lowering of Pyramid Lake. However, in situations such as discussed here, it may be appropriate to depart from strict efficiency economics.

As agricultural economists, we are for the most part stuck "dead center" on efficiency economics which is now losing some of its relevancy. An interesting contradiction in our "rational" analyses is often manifest by concluding a proposed course of action should be supported when the impacted group which may be compensated can easily be identified, particularly if it is generally felt that the group has been wronged or disadvantaged or if there is a significant effect on environment. At such a juncture, we experience no qualms about abandoning efficiency considerations on the basis of other overriding concerns. On the other hand, if the impacted element is simply some unidentifiable portion of the general society for which there is no readily obvious "need" for favoritism, we then quickly resort to strict efficiency economics as if it were the law. So many of the relevant considerations for economic analysis today are in the hard-to-quantify categories that we must allow these considerations to modify our efficiency conclusions until such time as we are able to include all relevant factors in analysis.

Water Allocation

This is a very stimulating paper, particularly since important conclusions are drawn concerning the proposed Central Arizona Project about which feelings run very high and deep. Authors Flinn and Day have done themselves a disservice by not extending their analysis over a longer period of time. There is no complaint about the methodology, but

the model is too short-run. A 30-year period of analysis is just not long enough when dealing with investments which last 100 years or underground water supplies which are exhaustible and presently comprise the entire water resource of a region. The long-run exhaustion of an underground water supply is a very real consideration for an arid area such as Tucson, and it must be conceded that it cannot be pumped forever. In this paper, the water problems of Tucson have been oversimplified in regard to both water supply and water quality.

I question if any useful purpose is served by assuming a grand water authority which would have control of all the water supplies of the region and would allocate the resource on the basis of efficiency economics. Such an abstraction from reality is a favorite activity of we economists, but I believe, in most instances, by so doing we abstract our work into uselessness.

The conclusion is drawn that the Tucson region will rarely find it advantageous to participate in and purchase water from the CAP. It would be useful to know how sensitive the model is to the assumed costs. It is implied by the authors that if Tucson were to participate in the CAP, the water would be delivered to the Picacho Reservoir and the City would be faced with building a distribution system from there to Tucson. The current plan for the CAP is to deliver the water to a point approximately 12 miles north of the City which is about the present edge of residential development. It appears this change could make a significant difference in the optimal solutions of the model.

It is surprising to me to find the conclusion that it would be economical to purchase any agricultural water from the CAP at envisioned prices (\$15 per acre-foot) when almost 10 years ago I interviewed farmers who were paying upward of \$25 per acre-foot as variable costs alone. I was also disappointed that so little concern was given to water quality. A large number of agricultural wells are now pumping highly saline water, some with as much as 10,000 ppm. As these aquifers diminish, the salt problem will get worse.

The paper concludes with serious implications for the CAP, and it is somewhat disturbing that the conclusions are drawn ignoring important information. This is a strictly efficiency analysis. Perhaps as economists we have enthroned efficiency as our "god" and "ignored the weightier matters of the law." We should not be only concerned with maximizing the returns to our resources, but we should also give emphasis to meeting the needs of people. Maybe efficiency analysis, as now practiced in the profession, is not entirely relevant to all of our problems.