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Current and Emerging Issues in California Water Policy

by

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Paper presented at the Western Agricultural Economics Association Meetings, Bozeman, Montana, July 23-25, 1978.

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INTRODUCTION

For the past year, a special University of California Task Force has been working to identify critical public policy issues for California agriculture in the 1980's. The intended audience of this study includes farmers, leaders in agricultural organizations, consumer advocates, environmental groups, agricultural labor, faculty and extension personnel, public policymakers throughout the state, and others interested in California agriculture.

Study groups consisting of approximately 20-25 different persons selected from the private sector, government, interest groups and the University were constituted for 11 different problem area topics. Participants were purposely selected from vastly differing viewpoints. Manuscripts developed by the Task Force core researchers, drawing from study group discussions and other sources, were then subjected to independent review.

This paper on current and emerging issues in California water policy draws heavily on the experience of the Task Force in the area of water policy issues. There are many interrelationships and interdependencies which make discussion of water issues a difficult task. For example, with water scarcity, the diluting properties of large amounts of water are lost to the system and the effects of pollutants become more severe. Thus, water quality and quantity should often be considered simultaneously in policy decisions.

Water policy needs to also be considered in conjunction with other factors such as energy policy, land use policy, and community impacts. Limitations of time, space, and intellectual capacity have minimized our attempts to provide such an integrated approach.

In any assessment of future issues, the problem also arises as to how to anticipate the discontinuous, unexpected events. Our approach has been to emphasize present trends and forces rather than try to anticipate the unexpected. However, one clear policy issue concerns what kinds of "insurance" should be provided against undesirable effects of such events. For example, some scientists argue our preceeding 40 year interval does not represent a normal weather period, but rather a period of very narrow fluctuations. In deciding what contingency plans and resources to set aside as insurance, public policy must also consider to what extent greater attention should be paid to research which centers on "futuristic alternatives." Unfortunately, discussion of futuristic solutions can often be upsetting to persons with value systems entrenched in the status quo. With anticipated rapid changes in the area of water policy and technology, agriculture will need to be receptive to change. The greater the difficulty of adjusting to needed change in a timely manner, the sooner solutions of a more futuristic nature will be required.

THE CALIFORNIA WATER SCENE

California's highly productive agriculture and burgeoning population have depended on relatively inexpensive water and energy supplies. Early recognition of the importance of water to the state's economy resulted in meeting needs through supply augmentation via conventional surface water development projects. These dams, canals, and offstream storage facilities with delivery through cooperative jurisdictions, give California one of the most highly developed water systems in the world. Extensive underground pumping complements the state's surface water supply.

In spite of the advanced water supply development (or, some would argue, because of it) water scarcity appears to constitute one of the

most serious forces which will affect California in the 1980's. The two year drought of 1976-77--one of the most severe in California history--has served to intensify the focus of public policy on water problems within the state. Out of this experience has come the expectation that water, rather than energy, will probably be the most limiting resource to which Californians will have to adjust in the coming decade. With agriculture the initial user of about 85 percent of the 31 million acre feet used in the state, pervasive adjustments in this sector can be expected in the future.

Even prior to the drought, normal seasonal overdrafts occasioned by underground pumping amounted to approximately 2.2 million acre feet annually. Failure to control overdrafts will result in continued problems of high energy requirements for pumping; land subsidence; and salt intrusion. While some experts believe substantial water exists at much deeper levels (in excess of 500 feet), barring some major breakthrough in water extraction technology, the costs of tapping such aquifers are expected to continue to be prohibitive.

The importance of state water policy may be even further increased by the possible shift in national water policy. Less federal support for western water resource development appears clearly to be a possible characterization of the future.

WATER POLICY AND CHANGING SOCIAL VALUES

Water policy decisions in California lie at the center of several important debates which involve basic value orientations.

It appears changes in value orientation may be occurring which could have profound impacts on water policy. The extent to which agriculture within the state should be protected or subsidized is increasingly being

questioned. Those favoring continued water (and other) subsidy, argue the importance of inexpensive, dependable food supplies and the important multiplier effects of an already established, pervasive marketing and processing sector. Important social benefits of rural communities and agriculture's role in their viability are also argued.

Opponents counter that whatever intrinsic economic or social benefits might have characterized agriculture in the past, such justifications are rapidly lost as agriculture becomes more and more like any other business. Favorable impacts on rural communities may be more likely from policies other than those favoring large farm operations. Finally, some question the extent to which cost savings in production are actually passed through to the consumer.

While agriculture may lose some of its former special considerations, changing values may delegate new socially important roles to agriculture. For example, agriculture may be increasingly called upon to provide and protect open space for urbanites. Irrigated agriculture and water policy may be utilized to resolve some of our persistent and pervasive unemployment problems, as agriculture is expected to become more an employer of last resort. Such extra-market expectations could again justify special considerations in water policy and other areas which benefit agriculture.

To the extent agriculture is awarded special treatment, a second set of issues arise from the equity implications of such assistance. While equity concerns have long been a consideration in policy decisions, they appear to be coming into greater prominence. There may be much less concern with assisting large efficient operations than developing programs to help disadvantaged groups, family farms, or minority cooperatives. Fears of increased economic concentration may in fact result in water policy becoming an instrument for reform within the agricultural sector.

Finally, while intrinsic values of agriculture may be increasingly questioned, there appears to be a growing acceptance of intrinsic values of water which is left in its natural state. Policymakers will be confronted with greater pressures to retain California's few remaining undeveloped rivers for aesthetic and recreational uses, or for future options.

Resolution of policy issues involves trade-offs which are particularly difficult to weigh in water issues. Problems of assigning monetary values to various water uses are well known to economists and will continue to stand at the center of policy controversies. As higher social value is placed on items which are intangible or difficult to measure in monetary terms, contributions of economists to policy decisionmaking are diminished. Groups with widely differing value systems will dispute what the "true" benefit-cost ratio should be. Where such disputes arise, some sense of perspective might be provided by sensitivity analyses conducted on the particular benefits in dispute.

WATER SUPPLY ADJUSTMENTS

Surface Development of Water Resources

Probably the most controversial policy decisions will involve levels of public support for conventional surface water development programs. Differing value systems again increase the difficulty in resolving the issue. Proponents find a basic incompatibility in "allowing" water to run to the sea while fertile land remains uncultivated and unirrigated, groundwater tables drop, and consumers complain about high food prices. These interests assign high values to agricultural uses and view it costly to society to allow aesthetic or environmental uses to displace or delay water development.

Opponents suggest we undervalue water as a public good in its natural state. The future value of water for recreational and aesthetic purposes which will accompany the anticipated increased income and leisure has been overly discounted. And, they suggest the inflexibilities and irreversibilities which accompany surface development, whether institutional or physical, should be avoided.

Opposition to the proposed Peripheral Canal illustrates the importance and magnitude of these differences. The Canal is opposed by many environmentalists on the grounds that insufficient water is assured for the environmental needs of the delta. Agricultural opposition is based on the belief that too much water will be provided the delta.

One of the most difficult messages for agriculture may be the need to reevaluate its expectations regarding the probability of receiving future surface water projects. Current estimates of the most inexpensive surface water supply projects in California range upwards of $150 -$200 per acre foot. Few forms of agriculture could pay such costs and remain competitive with production in other regions. Barring some unforseen major breakthrough in cost savings for surface development, it appears the public committment of federal or state subsidies will be unlikely given the current taxpayer resistance to government expenditures.

Of course, public attitudes could change and will be influenced by rainfall, success of conservation efforts, and changes in food prices. But, however the argument is settled, the time lag between funding and completion of large new projects dictates that for the 1980's, most of California agriculture will have to concern itself with adjusting to supplies from existing projects.

Groundwater Supply

Despite severe groundwater overdraft problems, some local interests have failed to develop management plans or undertake actions to reverse the overdraft problem. It is alleged that some localities may expect to be "bailed out" of their problems by surface water development projects. Thus, an emerging policy issue involves the extent to which public support should be provided to offset these overdraft problems, and the extent to which development of an intensive groundwater management plan should influence the granting of such support. The National Water Commission report of 1972 urged against providing project relief to areas mining groundwater which had not instituted conservation and management programs. Lacking development of local management programs, a closely related issue is the extent to which broader state interests and powers should supplant local decisionmaking.

It would appear that the direction of water policy in California is towards local planning rather than incorporation of groundwater into a statewide permit system. Several issues are likely to arise in setting performance criteria for the local plans. As environmental and construction costs of above ground storage increase, the ability of groundwater basins to serve as storage facilities becomes increasingly attractive. What mechanisms and controls, if any, should be required to encourage effective use of conjunctive use of ground and surface waters? Closely related is the issue of mining (the intentional depletion of groundwater supplies without replacement) and the extent to which or conditions under which it is to be allowed.

Characteristics of common property resources such as groundwater, which result in inefficiencies, are well known. Adjudication of groundwater

rights provides one means of overcoming the common property problem. In California, users have a very uncertain idea of what "right" actually exists and the basis on which determination of rights will be made in adjudication proceedings. Although the "mutual prescription doctrine" was previously employed (i.e., the view that in chronically overdrafted basins all pumping is adverse to others so each user acquires prescriptive rights against others in accordance with amounts taken) the Los Angeles v. San Fernando case overturns that basis and leaves unclear what basis will prevail. Prohibitive costs and lengthy proceedings have also served to discourage more widespread adjudication. One issue for public policy is the role which should be taken in expediting and encouraging adjudication of groundwater rights.

Protection of domestic and other uses of small amounts is an especially important issue. While pumpers have occasionally filed suits to enjoin pumping which caused well interference, the legal basis for such civil suits is not clear. Furthermore, such suits are expensive and often time consuming.

A policy area of considerable dispute concerns the extent to which tranfers or exports of groundwater out of a basin are to be allowed, and if so, under what conditions. Several counties have passed ordinances restricting such underground export and requiring permits to export. Whether these ordinances will or should be allowed to stand is still at issue.

It would appear that in general, California will not embrace far-reaching application of water pricing to allocate water supplies. However, in the instance of groundwater, pricing does have some chance of success. Some water districts already use pump taxes or "replacement water assessments" when pumping is in excess of each pumper's adjudicated share of the

basin's yield. Pump taxes are increased or decreased to influence the relative amounts of ground and surface waters used. An important area will be to assess the effectiveness of price allocations for groundwater, and to see what possibilities exist for wider applications.

Conservation and On-Farm Efficiency

The ability of agriculture to adjust to existing supplies will depend to a large extent on the possibilities for water conservation and increased efficiency in use. Great contention centers on the extent to which water conservation adjustments are feasible in agriculture. Some point out that apparent inefficiencies are deceiving: heavy applications may be important for salt leaching; downstream users may depend on "excessive" applications to provide sufficient run-off for their needs.

While a basin-wide perspective is important, opportunity costs associated with uses by individual farmers must also be considered. There is the need to incorporate the concept of consumptive use by crops, giving proper credit for return flows. Costs of application and quality deterioration from repeated use must be included along with the physical criteria. Delivery system efficiency may also become more important with greater attention being paid to seepage and evaporation losses. Irrigation application methods may similarly become of greater interest.

Regardless of the level of current efficiency in use, public policy must address the extent to which new information and technology will be developed which will require greater future adjustments. New drought and salt tolerant plant species and varieties may be developed and handling of salt accumulations might be improved to diminish impacts of both salt accumulation and water scarcity. Drip irrigation may be of temporary benefit, but if salt accumulation problems result, there is the need to

determine conditions under which drip irrigation might be applied in conjunction with other irrigation methods.

WATER QUALITY

Different Uses, Different Standards

Not all uses require the same level of quality nor have the same view of what constitutes water quality. High nitrate levels in water can cause public health problems, yet be desirable for agriculture. Policymaking might be helped by more complete and systematic inventories of water quality requirements and alternatives. More effective allocation of water of differing quality according to these requirements could extend existing supplies and also avoid expensive water treatment costs.

Once different quality requirements are determined, possibilities may exist for applying variations on the theme of separate facilities. Separate facilities allow for accommodation of incompatible uses or users of the same resource through separation. Classic examples include water skiing and fishing on the same lake and smokers and nonsmokers on an airplane. In the case of water, separate delivery systems for water of differing quality and cost could be developed to accommodate the needs of different users. Such considerations are likely to take on greater importance to policymakers as treatment and water development costs increase and as uses become more competitive.

Agricultural Adjustment to Water Quality Changes

Implicit in the discussion of separate facilities is the expectation that California agriculture may have to adjust to lower quality irrigation water as well as diminished quantities. It may be that delivery and use of lower quality water finds greater possibilities in urban uses than in

agriculture—car washes, landscape and decorative water uses, cooling and washing activities in industry seem to provide examples. However, until more information is available agriculture would probably do well to prepare itself for possible future adjustments.

The issue of how agricultural adjustments to changes in water quality might be accomplished has rarely been addressed. Research efforts have been more directed at identification of harmful effects associated with low quality water and the possibilities of improving water quality, rather than how production might be adjusted to the less favorable condition. Changes in cropping patterns which emphasize salt and drought tolerant plants, and construction of seedbeds to avoid accumulated salts provide counterexamples. However, it appears that little has been done to develop more resistant varieties, to introduce and improve new crops, to determine more effective conjunctive use of ground and surface waters, or to remove salt accumulations other than through flushing action.

Expanded use of lower quality water will depend not only on new technological alternatives, but also on the incentives for adoption which policymakers are able to provide. While prices would seem an obvious solution to economists, the lack of price allocation mechanisms at present and the nonhomogeneity and dynamic nature of water quality variations over time can severely challenge policymakers to fashion water allocation mechanisms in the future to accommodate quality considerations.

Besides adjusting to allocations of lower quality water, agriculture may also be called upon to adjust the quality of water which it returns to a water basin. With greater public awareness and concern about water quality; with high treatment costs and increased competition for available water—public policy may increasingly regulate the quality of water discharges. Agriculture, with its use of chemical fertilizers, pesticides

and herbicides, may receive increased scrutiny. It will be important for policymakers to have information allowing them to weigh the effects on the producer and consumer of discharge regulations.

The ability of California agriculture to adjust to changing water quality conditions will depend greatly on the extent to which policies are developed which provide for: (1) viable alternatives to maintain water quality; (2) better use of lower quality water; and (3) incentives to help the adjustment process.

COMPETITION FOR WATER USE

Water scarcity brings increasing competition among the different users of the resource. With inexpensive surface water supply development at an end, reallocations will increasingly impact on agriculture. The sources of competition are found both inside and outside of agriculture.

Competition Within Agriculture

Within agriculture, decreased water availability will tend to result in shifts in crop mixes as well as in producing regions. More water conserving crops and even dry-land farming may increase in some regions. Regions with more abundant supplies of water or prior water rights will tend to expand their relative production. Policies regarding the opening of new lands to irrigation can also be expected to change. However, pressure will be brought to bear on policymakers by vested interests concerned with easing the implied adjustments. Thus, public policy will have to decide the extent to which adjustment is to be encouraged or required.

Besides changes in cropping and regional adjustments, competition for water may also come from other than commercial, large-scale agriculture. Small (family) farms, alternative lifestyle subsistence units, urban

(community) gardens will also desire a priority in receiving water allocations. Public policy will be required to decide the extent such uses should be encouraged, and how waters are to be allocated.

Competition from Nonagricultural Users

The two major categories of nonagricultural uses which are expected to increase greatly in the future include municipal and industrial uses, and environmental and recreational uses.

Municipal and industrial uses—the apparent ease with which municipal and industrial uses can "outbid" agriculture certainly adds to agriculture's apprehension about the need for more surface water development. It is possible, however, that agricultural interests have underestimated the ability or willingness of these users to lower water consumption in response to scarcity or higher prices. While watersaving measures instituted during the drought may seem of minor significance to agriculture in terms of water quantities involved, it may represent a potential for substantial reductions in urban use. Some of the adjustments appear to involve permanent shifts in demand as restaurants continue to serve water only by request, gardens are planned for low water use; water conservation devices in homes are selected or mandated.

Many water conservation measures were instituted on a voluntary basis because of an increased water consciousness accompanying the drought. The challenge to policymakers will be how such conservation measures will continue to be encouraged. While use of water meters is expanding and can provide a means for pricing water, there is still considerable resistance to meters and allocation by pricing. Lacking the incentive of a drought or a pricing system, what other incentives can be provided?

The ability of municipal and industrial uses to outbid agriculture may also indicate that urban supplies can be augmented in ways not feasible for agriculture. The policy question is one of level of public support for technology and investment for providing new sources of water (such as desalinization) to municipal and industrial users rather than the large expenditures usually required for surface development.

Recreational and environmental uses--because of the different value perspectives discussed earlier, accommodation by agriculture to increased competition from recreational and environmental uses may be met with much more resentment than the competition from municipal and industrial uses. It will be difficult to reconcile the two viewpoints. While urbanites may extol the importance of retreating from the urban environment and the importance of keeping options open to future generations, agriculture may be unconvinced given the inability to quantify benefits and the difficulty of collecting from the beneficiaries. Decisions about encouragement and protection of water for recreational and environmental purposes will become especially difficult in the future if food prices continue to increase.

WATER RIGHTS AND CONTROL OVER WATER RESOURCES

Water in California has not been treated as a market commodity. Rather, it is allocated through a labyrinth of appropriative, riparian, pueblo, prescriptive and groundwater rights, as well as contracts and other arrangements. Issues relating to water rights and control will become more visible as competition for water increases. Problems are likely to arise from: (1) uncertainties and questionable security of existing water rights; (2) inflexibilities which discourage orderly and efficient transfers of water and rights; and (3) equity considerations relating to the current

rights distribution. Policymakers will be increasingly called upon to improve existing methods of allocation which have become outmoded.

Uncertainties Over Water Rights

For purposes of discussion, water rights uncertainties have been divided into uncertainties in individual water rights, area of origin rights, and water jurisdictional conflicts.

Individual water rights—uncertainties over water rights of individuals occur in part because of the unquantified nature of some rights and the failure to incorporate adjustments for variations in supply. Even where rights appear to be certain, a lack of monitoring and control over upstream users or prior appropriators may make the practical usefulness of those rights uncertain. In the area of groundwater rights, overexploitation of the resource is likely to result from uncertainty about the extent of one's rights. And, uncertainty over subsequent rights of withdrawal discourages activities such as waterbanking and efforts to recharge underground basins.

While adjudications provide for certainty of right, the process tends to be extremely expensive and time consuming. Underlying the groundwater rights issue is the basic decision regarding the extent to which the exercise of public control shall take priority over private rights to the water.

Area of origin—one of the most sensitive water rights issues is the extent to which control over water is reserved to those areas where the waters originate. Northern Californians are apprehensive about control of "their" water resources as political power shifts to the south and movement is seen towards a more public-interest view of water resources. This apprehension is at times reflected in what some might view as an obstructionist attitude. For example, it appears some would prefer uncertainty

and inefficiency in water rights than any consideration of change. However, until the issue is clarified, areas of origin may be overestimating their actual rights under the existing system. As broader public interests and control expand, policy issues will also center on the extent to which compensation and possibilities for future reverse transfer of water to the north will be provided.

Water jurisdictional conflicts--the different levels of jurisdiction between federal, state and local interests serve to increase uncertainty in water rights. Recent decisions in water quality raise the question of how far federal preemptive rights will be pursued and allowed. Where federal and state waters are co-mingled, the issue arises as to the extent the state will be required to relinquish its jurisdiction. Conflicts between state and local interests are illustrated by recent passage of county ordinances intended to regulate sales of groundwater outside the water basin. While intending to increase area of origin control over the watershed, uncertainty about the nature of individual water rights results.

The complexity of the issues and unresolved conflicts create uncertainties over water rights which result in mistrust and inefficient uses. Disincentives to undertake conservation practices and impediments to water transfers are often found. Over protectionism also is likely to result. Increasingly, there will be the need to find approaches which will facilitate greater cooperative efforts among local, state and federal agencies.

Inflexibilities in Water Rights and Allocations

Rigidities in the current water rights and allocation system inhibit the free movement of water towards optimum use. Examples include: riparian water which must be used on less productive lands than nonriparian lands which lack water; groundwater applied to overlying lands of lower productivity

than nonoverlying lands; appropriative rights awarded on a "first in time" basis which have little relationship to changing needs or productivity.

The exercise of a water right is constitutionally limited by the principle of "reasonable beneficial use." While providing some limited flexibility to the courts, the ability to determine "unreasonable" use introduces uncertainty and compensation problems.

Physical and institutional rigidities also exist within irrigation districts. Land may be excluded on grounds other than productivity. Transfers among individual members or between members of different districts may be hindered by requiring that any water conveyed in district facilities belong proportionately to all members.

EQUITY ISSUES IN WATER ALLOCATIONS

Policy decisions involving equity--what is fair, just or desirable--always involve subjective value judgments. Equity problems will continue to require attention in the 1980's in three general areas: (1) who is to be provided access to water resources; (2) how and to what extent shall existence of externalities influence allocative decisions, and (3) to what extent and from what sources will loss of water rights be compensated?

Access

Sale or other transfer of water rights is difficult under current institutional arrangements in California. Such a system tends to protect the status quo and exclude access to others. To the extent that concerns about more equal distribution of income and greater access to resources by disadvantaged groups continue, changes will be required in the current allocative methods. Indications of possible increased attention to equity issues are found in the pressures for more vigorous enforcement of acreage limitations and residency requirements on federal water projects. The

issue may become not simply one of access to water, but the extent to which water policy will become a tool for accomplishing substantial change in land tenure and agricultural organization. If this is to happen, it will be important to be able to realistically assess: (1) the extent to which alterations in tenure will result in improved income distribution, and (2) the impacts on agricultural production and efficiency of such changes.

The access to water rights by recreational and environmental groups is also likely to be raised as an equity issue. Is it fair to require such users of water to purchase land privately or to exercise some form of physical control or possession over the water rather than leave the acquired water in the watercourse for enjoyment?

Finally, the practice of allocating water in times of severe shortage on the basis of priorities also creates access problems. For example, perennial crops have been allocated water ahead of annual crops. Thus, costs are imposed on growers of annual crops without compensation out of the perennial crop losses which were avoided. And, if such a standard were to become formalized, distortions would arise in terms of heavier plantings of perennials.

Externalities

It would appear that the most serious externality issue relates to the third party effects of water which might be transferred outside of a water basin by private individuals. Such individual decisions to transfer water out of a basin could cause diminished sales of farm inputs in a community, business foreclosure, outmigration of residents and increased public service costs to those remaining. Critics of water pricing schemes and transfer mechanisms present this externality argument as a principal

reason for supporting current allocative mechanisms. They assert that the inability to identify harmed parties and to affix levels of damages creates inequities which cannot be allowed in the name of greater efficiency. Opponents point out that since such water transfers could prevent deterioration of, or provide new stimulus to, the recipient community, their denial also creates inequities. They point out that small, marginal changes are likely to result in a community rather than the "agriculture closing down" arguments often presented. They would further argue the "fairness" of requiring consideration of all externality impacts, and providing protection and compensation. Similar guarantees are not provided communities or businesses from other changes in society—such as buildings of highways, etc. Obviously, the issue of how to handle externalities associated with water transfers will be with us for some time into the future.

Compensation

Compensation problems are intimately related to the externality issues discussed above, but also extend much beyond externality considerations. As inefficient use of water becomes increasingly unacceptable, the courts may exercise a dominant role by redefining water rights; more legislative or agency controls may be imposed; or, different allocation mechanisms such as pricing may be utilized. By whichever means, agriculture can expect its capacity to control water resources to be eroded. Residents in areas of origin are also likely to find their water transported away to regions of more urgent need.

The manner in which such reallocations are undertaken will make a great deal of difference. Individual rights may be "taken away" by court interpretations that the "reasonable beneficial" criterion fails to be met.

A finding of "unreasonable use" could seem to allow little basis for compensation. Similarly, area of origin waters might be "taken away" through determination than an inability to put the waters to immediate use constituted the existence of "excess" waters. Again, little basis might exist for compensation of waters which were in "excess." In both instances, failure to provide compensation is likely to result in hostility and resentment.

For the individual, the compensation issue becomes more complicated when, as is frequently the case, water is publicly subsidized. The question of whether such windfall gains should be compensated is a legitimate question, but it should be realized that compensation simply formalizes the gain which was created in the first place. And when gains become capitalized into land values, it soon becomes difficult to determine the extent to which such gains still exist.

Areas of origin view their resources as being "plundered" by taking water without sufficient regard for their own future needs. Insult is added to injury when they are called upon through taxation to help fund the water exports. Such water can represent options for future development and insurance for the future. It would certainly have a sales value in the recipient region.

When the desire to avoid a price system results in failure to compensate through usual means, alterantive compensation approaches will have to be found if "fairness" is to be maintained. It is apparent that some of the most difficult issues ahead for California water policy concern how, and to what degree, compensation is to be provided when water rights are taken or reduced.

gg/bp 7-21-78