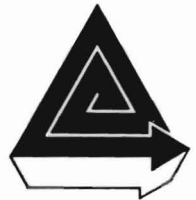
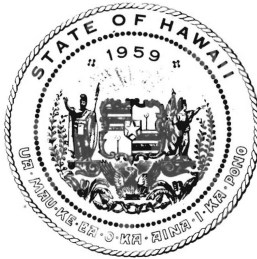


Land and Water Resource Management in Hawaii

Hawaii Institute for Management and Analysis in Government

HAWAII STATE DEPARTMENT OF BUDGET & FINANCE





Land and Water Resource Management in Hawaii

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FOREWARD

The material in this volume was researched and compiled through the Special Analytic Studies Program sponsored by the Hawaii Institute for Management and Analysis in Government. This program is designed to research and analyze significant public policy issues which confront state decision-makers, while training state employees in analytic methods.

In the preparation of this document, interdepartmental teams of analysts were assembled under the leadership of professors from the University of Hawaii. The professors provided technical expertise and directed research efforts during the six-month process of analysis and report preparation.

The management of Hawaii's precious land and water resources is the general theme of this work. The three studies presented here set out to establish a basic foundation of data and scholarly research, helpful to decision-makers and to the development of appropriate public policy.

The topics on resource management were selected for analysis because much important legislative activity may soon focus on this sensitive and complex issue area. This research, though constrained by time, money, and manpower limits, is an attempt to provide some resolution and guidance in the face of such complexity.

The completion of this document would not have been possible without the dedicated services of Lynn Nakamura in the typing and proofreading of each of the studies. Acknowledgement is also extended to Norman Webber for editing this volume and for coordinating the research efforts, and to many others, too numerous to mention here, who contributed to this effort.



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INTRODUCTION

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January, 1979

In 1978 a new emphasis in public policy legislation and debate occurred which will influence policy decisions in Hawaii for decades to come. This emphasis focused on the increasing responsibility of our State Government to plan and manage growth in Hawaii and was a recurring theme in public hearings and debate on various pieces of environmental and social legislation.

During the 1978 legislative session, Governor George Ariyoshi presented to the legislature the first comprehensive package for managing growth in Hawaii. This package was an innovative approach on the part of the Governor intended to trigger community discussion and legislative activity on various aspects of growth management. It identified possible strategies by which the State could reasonably expect to influence the direction, rate, and timing of growth.

The success of that effort may be measured by the significant amount of dialogue and ideas which it generated. In addition, during that session, the legislature passed and the Governor signed into law the Hawaii State Plan which sets out planning priorities and directions for future growth in Hawaii; the first planning document of its kind in the nation to be adopted by statute.

The Hawaii State Plan is a long-range guide to Hawaii's future. It establishes an overall theme with goals, policies, priority directions, and a system for plan formulation and program coordination in major state and county activities.

The plan addresses concerns about our growing population, the need for jobs and a stable economy, the maintenance of a quality physical environment, adequate facility systems, and the socio-cultural advancement of Hawaii's people. The input of various public and private groups, the Governor, and the Legislature helped formulate a plan which, as accurately as possible, reflects the needs and desires of Hawaii's residents.

In sum, during the last legislative session both the executive and legislative branches of state government recognized and responded to a growing statewide concern for our future social, economic, and environmental well-being. This was truly the birth of a "growth management ethic" in Hawaii's public policy.

Though much controversy surrounded just how this "ethic" should be best expressed in statutory form, one fundamental point of agreement remained intact. That point is that the citizens of the State of Hawaii have a fundamental right to a wholesome social, physical, and economic environment and that protection of the right to this kind of environment must begin with affirmative state action.

The social, physical, and economic elements of our environment are all interdependent. That is, actions upon any one area will likely affect these other areas, either initially or over a prolonged period of time. Therefore, state actions in each of these areas must be undertaken to protect or improve existing conditions without causing untoward harm in another area. For example, the State must act to encourage economic stability but must take care not to encourage polluting industries which would disrupt our island ecology. Clarifying and balancing these tradeoffs in public policy decisions is the greatest challenge to proper growth management in Hawaii.

Of particular concern, in recent years, is the management of the physical environment and the ramifications this management might have on the availability of housing and jobs, and the economy in general. Increasingly, public opinion reflects the sentiment that the State of Hawaii needs to play an active role in the shaping of its environmental, social, and economic future.

This new growth management ethic recognizes that state environmental responsibilities extend far beyond previously recognized areas of general conservation or public health regulation. Our people's right to a decent environment means the State must take affirmative action to preserve and maintain not only clean air and pure water, but also the natural, scenic, historic, and esthetic values of the community.

The problem is not as simple as limiting the number of people who enter the State. It is a far more complex process of assessing the impacts and trade-offs of development and growth decisions on the economy, the environment, and the welfare of the people in general. However, the goal of the process can be simply stated. The State is not only obligated to see that our natural resources are developed to the most beneficial social uses in order to accommodate our population, but it is also obligated to preserve those resources in such a manner as to permit future generations to enjoy a life at least as rich and varied in natural, scenic, and cultural beauty as that which we enjoy today.

Responsible management of our resources, especially land and water, is more than just good sense; it is a necessary condition for future prosperity. Previous generations did not foresee the consequences and extent of environmental and social degradation brought about by the new demands of our highly technical society. As Governor Ariyoshi has repeatedly pointed out, this is a legacy we cannot afford to pass on to our children.

The Governor's concern for responsible planning and management of growth has been expressed frequently and has been the major focus of his

State-of-the-State address in previous years. In his 1977 address the Governor outlined the problem:

"Hawaii is a national treasure, but it is a very fragile treasure, one which can be easily destroyed by overpopulation and excessive demands on its resources.

There is no reason why we must endure what an uncontrolled and an unregulated future holds for us. We must shape our own future, not have it thrust upon us by forces over which we have little or no control."

When introducing the State Plan during his 1978 address, the Governor underscored the progress being made to control the future:

"The Hawaii State Plan is not the end, it is a beginning. It is the beginning of us finally taking control of our destiny. It will serve notice that we know what is good for this State, what is proper and what is achievable."

The importance of the state's role in managing and protecting the environment was also reinforced by the Hawaii State Constitutional Convention, held during the summer months of 1978. The amendments from the Convention define new state constitutional obligations and responsibilities in managing and planning growth and development.

These amendments call for the State to promote a healthful environment, to conserve and protect the natural beauty and resources of Hawaii, and to plan and manage population growth. The amendments aim at promoting self-sufficiency and go so far, in the protection and control of water resources, as to mandate the legislature to create a water resources agency to regulate that resource.

The November elections of 1978, which saw these amendments added to the State Constitution, indicate the importance of these concerns among the general public. These constitutional amendments now provide the statutory basis for legislation needed to implement state programs in compliance with the changes.

But the most important change, that is the change in how we think about environmental problems, has already taken place. Land and water, as elements of our environment, are more frequently and properly being thought of as resources rather than commodities. This shift in perspective recognizes that these elements have a value to society beyond their market price, and this social value requires that land and water development and preservation decisions uphold the public interest.

In anticipation of this shifting emphasis in state policy, various executive departments throughout the state government have already begun to respond to these new considerations in resource allocation decisions.

At this point, numerous state actions have provided broad policy guidelines concerning how to proceed in the future. Yet, the element still necessary to assure that resource allocation decisions reflect the most beneficial social purpose is the decision-making mechanism and tools to turn general guidelines into affirmative public policy. Simple benefit-cost analyses are no longer adequate to assess the complex and occasionally contradictory social benefits and costs which must now become an integral part of the decision-making calculus.

It is toward this impact assessment and decision-making methodology of alternatives analysis and trade-off reconciliation that the attention of state government is now being directed.

The three reports in this study have taken a close look at land and water resource allocations and the trade-offs, problems, and constraints associated with them. Hawaii has faced the problem and noted the likely effect of uncontrolled growth in the State. Now we are working to identify the reasonable bounds within which we may act for the public welfare while respecting the importance of a healthy economy, county planning and management efforts, and the rights of private citizens.

These reports examine three different aspects of resource allocation decisions: land use, water allocation, and water rights. This effort should assist various government agencies and other planning groups improve resource allocation decision-making and help assure a future in Hawaii that we can be proud to pass on to future generations.

GROWTH MANAGEMENT AND THE LAND USE COMMISSION: SOME OPTIONS FOR CHANGE

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SUMMARY

Hawaii is not confronted with the issue of whether or not it should develop a growth management system; it has one. A range of policies, land use controls, and other mechanisms provides this State with the opportunity to direct growth and manage the consequences of that growth to a greater degree than any other state in the nation. The existing system is a reflection of public attitudes toward growth. The issue in Hawaii is rather that of how its system of growth management should evolve.

The policy environment within which Hawaii's growth management system exists is not only very different from that found in other jurisdictions, but it is also changing over time. For example, while the intent of the Land Use Law was relatively simply expressed in a few statements when that law was passed in 1961, the range of policies to which that law must now relate is much more complex. The culmination of this process of enriching the policy context of Hawaii's state land use regulatory system was the adoption of the Hawaii State Plan by the 1978 Legislature. That plan, which was the product of years of effort and which reflects a balancing of diverse constituencies, including the state and county governments, is a very significant "given" in any ensuing discussion of growth management.

Act 100, the Hawaii State Plan, provides a framework of objectives, policies, and "priority actions" which are to be addressed by all state agencies, including the Land Use Commission and the Board of Land and Natural Resources. These objectives, policies, and guidelines are significant as elements of state growth policy because, in particular, the Land Use Commission is a principal state agent of growth management.

When examining developments in the state's growth management program in the immediate future, the reality of the State Plan and related legislation looms large. Fundamentally, there are two choices: first, think in terms of a growth management system irrespective of the existing system and design a system which is not constrained by existing law; and second, deal with marginal improvements to the existing system, recognizing that that system represents a significant statement of values and preferences. This study takes the latter course. As recent as one or two years ago, the choice between these two alternatives might easily have been the former; however, the Hawaii State Plan has greatly altered the environment within which any growth management system must be developed.

This study begins with a recognition of the pivotal role of the Land Use Commission (LUC) in determining the direction of growth in terms of land use. Certainly, other instruments of public policy exert an influence on the location of growth, such as tax policies and the provision of public facilities. But with few of these is the linkage between decision and consequence so direct as it is with the LUC.

The LUC is guided by legislatively enacted policies. An essential characteristic of the existing system is that the LUC is granted considerable discretion in its decision-making; the guiding policies are general and require both considerable interpretation and the exercise of judgment in their application. Improvements in the system might focus on any of several components of the system. For example, such improvements might be concerned with increasing the specificity of the policies, with constraining the decisions of the LUC when certain conditions are met by proposed developments, or with modifying the procedures of the Commission. This study examines several marginal changes to LUC operations, discusses their operation, and assesses their performance.

The alternatives investigated are:

(1) Guidelines Revision. This option would entail a focusing of the multitude of concerns expressed in existing legislation (particularly the Hawaii State Plan and the Land Use Law) by specifying a smaller set of guidelines for use by the Land Use Commission in its decision-making processes. Any such system of guidelines revision must accept the reality of existing legislation which constrains the LUC. This option would not be a substitute for that legislation, but would serve to clarify it and provide a focus on the most significant factors which the Legislature judges should influence LUC decision-making.

(2) A System of Performance Standards. A performance standards system would specify levels of consequences of land use changes which are deemed acceptable. As such, they are akin to guidelines, but allow less room for making value judgments. These levels of acceptability, or standards, could be adopted by regulation. By clearly stating what the standards are, the LUC could exercise considerable leverage over development. The LUC would have a framework for comparing the relative acceptability or desirability of different development proposals.

(3) A Regional Environmental Assessment System. This option is a response to observations that the LUC has had a geographic perspective that is too narrow. This alternative entails a requirement that broad scale implications of land use change at a particular site be considered in LUC deliberations, for example, an examination of significant system-wide transportation impacts of urban development.

(4) A Regional Sketch Plan. A sketch plan is an interpretation of existing policies in mapped form. The argument behind this proposal is that, given the multitude of policies embodied in the State Plan, the LUC would be well-served by seeing those policies expressed in terms of particular land units. For example, a policy specifying a preference for preserving certain types of agricultural land in that use could be illustrated by mapping lands of those types. Many policies are capable of being mapped in this fashion, although others are not. The sketch plan would serve as an information base for the LUC and would not, in itself, be a land use district boundary map.

(5) A System for Consolidated Review of Boundary Amendment Petitions. This option is in response to the observation that existing LUC procedures do not provide for a comprehensive overview of what changes are being proposed in a region. This proposal would have boundary amendments in each county being made only once every four years. The resulting "stacking up" of petitions would permit an assessment of the cumulative impacts of sets of petitions and a selection of the preferred set of petitions from the total.

All of these proposals have significant advantages and disadvantages. While none of them challenges the validity of the LUC as an agent of growth management, they all, to different degrees, provide for significant change in LUC process or substance. They all serve to make the LUC decision-making process more explicit.

No single alternative from among those examined here is clearly established as the preferred alternative. Rather than adopting a "pure" alternative, a strategy for marginal change is suggested. This might involve at least the following:

(1) Guidelines revision to the extent that the multitude of objectives, policies, priority actions, and guidance policies now bearing on the LUC is distilled into a manageable set. The State Plan now requires the LUC to address all the provisions included in the Plan in its rules and regulations. This is a monumental task unless some legislative guidance is provided.

(2) Development of some elements of a sketch plan to the extent possible, based on a reduced set of revised guidelines. Given the strong policy statements in the State Plan, it is reasonable to see their advance expression on maps, if that is possible.

(3) Further consideration should be given to giving the LUC a more pro-active role in growth management. Whether or not it is to assume such a role is a fundamental question that is far more basic than a discussion of specific alternatives. If it is agreed legislatively that the LUC is the proper body to exercise pro-active growth management functions, then a range of alternatives might be employed in its processes, including a performance standards system and tools that further aid a comprehensive viewpoint, including procedures for requiring regional environmental assessment and consolidated review of boundary amendment petitions.

It is, perhaps, these fundamental questions of what role the Land Use Commission is to play vis-a-vis the other agents of growth management (e.g., whether it is to continue to be reactive or become pro-active in nature) that require the most attention at this time.

INTRODUCTION

This Study in Context

This examination of land use management procedures and their role in Hawaii's growth management program is a direct outgrowth of a study done in 1977 which was reported in Growth Management Issues in Hawaii.2/ That study investigated state land use management as one aspect of growth management. This study seeks to explain further some possible modifications to Hawaii's land use regulatory system and to demonstrate their application.

It is useful to clarify the relationship between growth management and land use management. Growth management seeks to contain the consequences of growth within acceptable levels. For example, traffic congestion and water quality might be two aspects about which a community is concerned and which are linked to growth. A growth management program might appropriately consider the relationship between the timing, location, and density of growth and other land use considerations on these concerns. However, mechanisms other than land use controls can also be employed in growth management programs. For example, public transportation policies and programs obviously affect automobile congestion; pollutant discharge regulations affect water quality; taxation policies may indirectly affect both. The purpose of having a growth management program is to effect a desirable quality of life in the community; it is not to limit or otherwise influence growth per se. A variety of mechanisms can be employed to accomplish this.

The particular aspects of growth that communities emphasize in their growth management programs depend on the community problems they face and the types of growth control tools available to them. They share one central characteristic, however. All growth management programs have at their core some form of land use management system which affects the rate of growth, timing, location, and density of new land development. That is, land use management is generally the principal element of growth management programs.

The importance of land use management to growth management should not be underestimated. While there is a continual stream of new ideas about how communities' problems can be alleviated, many of them have not been tested in two respects--either in practice or in the courts. Land use regulation in many forms is well tested, however, both in terms of effectiveness and legality, and therefore, has immense appeal to growth managers.

One attribute of land use management that contributes to its appeal is that the process involved in coming to a land use decision can be very extensive in terms of its substantive scope. Land use decisions are increasingly based on information about a multitude of anticipated

consequences of the decision, such as impacts on the local and regional economy, on natural resources, on the housing market, and on government finances. Such deliberations surrounding the decision require the prediction of the impacts of that decision and how those impacts could be managed. Land use decision-makers, then, have the capacity for exercising their influence on many substantive areas concerned with growth management.

Hawaii's Land Use Law

Hawaii's attempts to implement a growth management strategy originated with the Land Use Law.^{3/} The Land Use Law, enacted in 1961, was designed to control the rapid urbanization of the state's best agricultural land and to prevent development on land units not contiguous to existing urban areas.

Means of Control

The Law mandates the classification of all lands in the State into one of four districts: urban, rural, agricultural, and conservation. Definitions are provided in the Law for each of the four districts.^{4/} These definitions are intended to indicate the types of land units that should be included in each district.

What makes the Law important in terms of state growth management is that changes in the district boundaries, particularly changes that result in additions to the urban district, determine how much urban areas are to be expanded and where new development will be located. This determination of how much growth is to be allowed is critical. If the boundaries are too loosely drawn, the result may be an irregular, discontinuous pattern of growth. Such a pattern of growth can result in much higher costs for public services and facilities, such as roads and sewers. Tightly drawn boundaries, on the other hand, increase the competition for development approvals and increase land costs as developers compete for developable land units.

The second major category of planning decisions delegated to the Commission are those involving the determination of where new development is to occur. Should Honolulu be allowed to encroach on prime agricultural land? Will more urban expansion occur in Windward Oahu where small farms and low density development are now prevalent? Decisions about the location of urban expansion have critical implications for the direct public costs of growth; the provisions of water, roads, sewers, and schools. They also have important social implications. A tight urban limit in which growth is allowed to occur only in carefully selected locations lessens the public costs of development and protects certain existing land uses, such as plantation agriculture or small farms, but could easily result in increased housing costs if too tightly drawn.

From a planning perspective, the primary impacts of district boundary amendments are on the direction of urban development, the size of the urban district resulting from the original boundaries and subsequent district boundary amendments, the trade-offs between urban and other uses, particularly agriculture, and the protection of environmentally fragile areas from uses that would degrade or deplete the land. Each of these potential impacts has secondary and tertiary implications for costs of providing public services, potential agricultural revenues, the amount of open space, scenic values, and environmental degradation.

Procedures

A nine-member Land Use Commission appointed by the Governor rules on petitions for changes in the boundaries.^{5/} Petitions for boundary amendments may be made by:

1. The Land Use Commission;
2. State departments or agencies;
3. County departments or agencies in which the land is situated; and
4. Any person with a property interest in the land sought to be reclassified.^{6/}

By far the great majority of petitions are initiated by property owners or those holding a development interest in the property. Nearly ninety percent of such petitions are to amend the boundaries in order to add to the urban district.^{7/}

The process of changing district boundaries begins with the filing of a petition with the Commission. Such petitions are required to provide basic information about the land unit including ownership, tax map key, county plan designation, and present use of the land. Petitions for urban classification also are required to provide information about proposed urban uses, preliminary development plans, availability of public services and the like.^{8/}

The Commission is required to conduct a hearing between 60 and 180 days after the filing of a complete application and formal notification of the public has occurred.^{9/} A recent amendment to the Land Use Law requires that such hearings be conducted according to the "contested case" procedures of the Administrative Procedures Act.^{10/} During the hearing, all parties have an opportunity to present evidence, to call witnesses, and to rebut the testimony of witnesses. The Commissioners themselves may also question witnesses. The presiding officer, whether the chairman of the Commission or a hearing officer, administers oaths, receives evidence, receives offers of proof, and rules on certain objections or motions.^{11/}

Full participation in boundary amendment process is limited to "parties."^{12/} The petitioner, the Department of Planning and Economic Development, and the Planning Department of the county in which the land unit is situated are automatically parties. Standing may also be granted to "all departments and agencies of the state and of the county in which the land is situated . . . upon timely application for intervention."^{13/} Standing is also granted to persons with a property interest in the land as well as those who reside on it or can demonstrate that they will be directly affected by the proposed change.^{14/} Other persons are granted standing at the discretion of the Commission.

While the Commission may deny standing to those whose rights to standing are not clearly articulated in the law on the basis that their testimony is likely to be redundant or that it would make the proceedings unwieldy in practice, the Commission has rarely denied petitions for standing on substantive grounds. Denials of standing have usually been made on procedural grounds.

Of particular importance from a planning perspective is the role of the Department of Planning and Economic Development and the Commission's staff in the proceedings. Earlier in Commission history, the Commission's staff assumed an advocacy role in Commission proceedings. The staff gathered information about the petition and sought to evaluate the petition in terms of policies in the Land Use Law and the Commission's own rules and regulations. At present, the staff performs a somewhat different role; one of generating information for the Commission about the petition. The advocacy role one played by the Commission's staff is now played more by the Land Use Division in the Department of Planning and Economic Development.

The Commission must approve, modify, or deny the petition within a period of between 45 and 180 days following the close of the hearing.^{15/} All approvals for boundary amendments require six affirmative votes.^{16/} Commission decisions are issued as a decision and order.^{17/} Commission decisions are accompanied by separate findings of fact and conclusions of law. Moreover, if any party has filed a proposed finding of fact, the LUC must incorporate in its decision a ruling on each proposed finding so presented.^{18/}

In approving boundary amendments, the Commission may decide to approve only a portion of the land for which the change is requested. In addition, the Commission may attach conditions to their approval as necessary to uphold the general intent and spirit of the Land Use Law and Regulations. Such conditions include, but are not limited to, the provision of public services and facilities by the developer or the dedication of land for such facilities and for rights-of-way to beaches or mountains.^{19/}

Provision is made in the Land Use Law for two types of appeals in the boundary amendment process. Persons who have been denied standing as parties may appeal under one provision.^{20/} The second type of appeal provides for judicial review for parties who seek to establish that a

decision and findings are "contrary to the clear preponderance of evidence."^{21/} The section of the Administrative Procedures Act which allows for such appeals requires that they be made within thirty days of the Commission's preliminary ruling or within thirty days after service of the certified copy of the final decision and order.^{22/}

Growth Management Issues in Commission Decision-Making

A number of issues have been raised about how the Land Use Law has been implemented by the Commission. These issues have to do with both the process and substance of Commission decision-making. In this section, a number of those issues dealing in particular with growth management at the state level are discussed.

Comprehensiveness.

One such issue has to do with the comprehensiveness with which the Commission deals with land management issues. As noted above, a growth management strategy based on land management requires careful attention to questions about where new development should occur relative to existing urban areas, as well as how much land should be designated urban so as to insure that developers can exercise some choice among land units (i.e., that the LUC is not a willing ally in the creation of land monopolies). A major change in land use district boundaries affects not only the petitioner, but also the land use plans of contiguous landowners and landowners in other parts of the island. It forces public agencies to adjust their plans and programs to provide public facilities and services not only for the immediate decision, but also for other amendments that may follow.

Critics of the Commission argue that the Commission focuses too narrowly on the petition before them and does not give sufficient attention to the "multiplier effects" of the decision they face on other factors. The Commission's initial decision on Mililani Town in the early 1960's is often cited as a case in point by Commission critics. Mililani was the first major boundary amendment involving agricultural land in Central Oahu. Critics argue that the Commission's decision on that petition set a precedent that made it difficult to deny subsequent petitions by other landowners in the same area. Most such land units involved prime agricultural land, and approval of such land units for urban use, whether merited on other grounds, was in direct contravention of one of the original purposes of the law.

Part of the difficulty in getting the Commission to take a broader view of its land management responsibilities has to do with the structure of the law, the lack of explicit policy guidance, and the analytical capability. The law was originally designed to insure that amendments to district boundaries occurred as part of a comprehensive review conducted every five years. The so-called "five-year boundary review" mechanism was viewed as a mechanism to insure that the Commission took a comprehensive approach to district boundary amendments.

Individual boundary amendments could be viewed in a larger context or island and even statewide land allocation in such a process. In practice, however, the so-called "interim boundary amendment" procedure in which landowners were allowed to petition at any time for a boundary amendment became the norm rather than the exception. Recently, the five-year boundary amendment procedure was abandoned entirely in favor of the interim petition process.^{23/} The nature of that interim petition process encourages members to focus more narrowly on the land unit under petition rather than take a more comprehensive view.

A second related problem is that the Commission is provided with little explicit policy guidance that encourages a more comprehensive perspective. The original district boundary regulations regarding changes to urban districts required that the Commission "insure that there was a sufficient reserve" of undeveloped urban land to provide for urban growth for a ten-year period. Nor do the interim guidance policies adopted in 1975 encourage a more comprehensive view. There are, however, some priority directions in Act 100 which could conceivably, but not necessarily, encourage a broader, less ad hoc perspective.

Finally, part of the difficulty of taking a more comprehensive perspective is that the bounds of "comprehensiveness" are difficult to specify and defend. Which potential effects should be included? Can they be identified and measured with any certainty? These and related questions have continued to vex those who have argued for greater comprehensiveness in Commission decision-making.

Discretion in Commission Decision-Making

Some critics of the Commission's decision-making have examined the lack of comprehensiveness argument to suggest that decisions are not only ad hoc, they are also arbitrary. Hence, the degree of Commission discretion in applying statutory policy and its own regulations in ruling on specific petitions is at issue.

Clearly, the potential for the Commission to exercise a great deal of latitude in decision-making is inherent in the criteria upon which decisions are based. Neither the Commission's regulations nor the interim guidelines provide strict admonitions to the Commission. Scattered urban development is to be "avoided," in the language of one guideline, but it is not forbidden. Conservation land is not to be reclassified "insofar as practicable." Reclassification should not result in "significant" adverse effects on agricultural, natural, environmental, recreational, scenic, historic, or other resources of the area.

The exercise of discretion by the Commission occurs in two ways. First, the Commission has to make a decision about whether particular policies apply to the land unit for which a boundary amendment is being sought. Here the issues are factual: Would a boundary amendment result in scattered urban development? Does the land unit include some prime

agricultural land? Second, the Commission exercises discretion by making value judgments about the extent to which particular policies apply. Would the impact of the proposed boundary amendment have "significant" adverse environmental impacts? Are existing public facilities and services "adequate"?

Alleged "arbitrariness" in Commission decision-making occurs with regard to the second type of discretion issue. That is to say, the Commission rules that a particular type of impact is "significant" with regard to one petition, but insignificant with regard to another petition when, in fact, the two land units have similar attributes and the two proposed uses would result in similar impacts. One empirical analysis of Commission decision-making indicated that type of arbitrariness was particularly evident with regard to petitions involving large land units.^{24/} Large land units were more consistently approved for urban uses, either wholly or in part, than smaller land units having similar attributes.

Major reduction in the degree of latitude exercised by the Commission in its decision-making would not be without some costs, however. One obvious way to reduce the degree of discretion is to specify legislative policies in great detail and to bind Commission decisions to those policies. The difficulty with this and similar approaches is that it requires developing an exhaustible set of policies that describes virtually every combination of relevant attributes a potential developable land unit might have. Not only does such an approach require a great deal of technical sophistication to develop such policies, it would also require more consensus about value issues in land management than has heretofore characterized public control. Moreover, it would result in an almost mechanistic approach to Land Use Commission decision-making; an approach that leaves little room for judgment.

LUC as a Guidance Mechanism

A third concern about the Land Use Law has to do with its utility as a land use guidance mechanism. Most growth management mechanisms are used to guide the location, timing, density, or rate of growth. Such mechanisms are usually pro-active in the sense that they are used to direct or shape growth consistent with a set of well-specified objectives that may or may not be set forth in mapped form. In its original conception, the Land Use Law also fell into this category of pro-active mechanisms. The five-year boundary review procedure was an opportunity to choose among several alternatives in directing the location of growth and the supply of land available for urban development. The Commission could make explicit trade-offs among several alternatives while still leaving most of the development initiative with the private sector.

Over the years, the five-year boundary procedure declined in importance and was finally abandoned. The Commission has focused instead on individual petitions proposed by the private sector. While the Commission has the authority to initiate petitions themselves, they have chosen instead a reactive posture; a posture of dealing with petitions

serially. The net effect of this approach is to place more and more authority for making basic growth management decisions with the private sector. The private sector chooses where and, within the time constraints posed by the development review process, when growth will occur.

A fundamental issue raised by the new concern in growth management is whether the Commission should again take a more active role in guiding growth.

Proposals for Reform of the Land Use Commission

In spite of its many accomplishments, the Land Use Law is frequently identified as being in need of improvement. Most of the proposed changes would constrain the action or discretion of the LUC. Some recent proposals are now briefly reviewed.

Guidelines Revision

The LUC currently operates under rules and regulations which incorporate "interim" guidelines for decision-making which were initially adopted by the Hawaii State Legislature in 1975.^{25/} Those guidelines were intended to be replaced by "permanent" guidelines which were to be incorporated in the Hawaii State Plan, which was mandated by Act 189, SLH 1975.^{26/} That plan, adopted as Act 100 in 1978, does not have a "permanent guidelines" section, although the plan provides guidance to the LUC in the form of objectives, policies, and priority directions.

To provide the LUC with guidelines, the Department of Planning and Economic Development prepared a revised set of guidelines for consideration by the 1978 Legislature. Those guidelines failed to pass out of committee.

Attempts at Enacting Pre-Decisions

Another approach to land use decision-making is to legislate certain decisions--termed "pre-decisions" here. There were proposals in the 1978 legislative session for such laws. Noteworthy among these was a bill whose primary intent was to preserve in the "agriculture" land use classification the state's best agricultural lands.^{27/} The legislative proposal was noteworthy for its simplicity of operation. Land units with certain characteristics--basically high agricultural productivity--would, under the proposal, simply be barred from conversion to urban use. The Land Use Commission's discretion would be pre-empted in these cases. Some other agricultural lands would be capable of conversion to urban use if both the LUC and the Board of Agriculture

concluded in the conversion. This provision would have severely curtailed the LUC's freedom of action. This bill died in committee. Nevertheless, it is only one example of attempts that have been discussed or proposed in the Legislature to constrain LUC decisions. Most objections to such proposals revolved around the argument that such simplistic decision rules cannot possibly be sensitive to the many issues that must be weighed in coming to reasonable land use decisions.

Performance Standards

Still another proposal before the 1978 Legislature would have resulted in the LUC modifying its regulations in order to explicitly assess a set of consequences of any proposed land use change. This procedure would require the following: (1) the development of a set of questions to be asked of any proposed land use change which deal with the anticipated consequences of the change (e.g., Would the development be adequately served by highways?); (2) the determination of some minimum performance standard for each of the questions (i.e., a level of performance, such as a level of highway congestion which, if not achieved by the proposed development, could result in denial of that petition for land use change); and (3) the development of a negotiation process by which proposed land use development could be approved if certain conditions were met by the petitioner (e.g., congestion problems could be overcome by the provision of highway improvements by the petitioner).^{27/} One version of this proposal calls for the assignment of different scores to the proposed development, based on the degree of severity or benefit of the proposed change in terms of each type of consequence (e.g., different levels of highway congestion would be assigned different numerical values reflecting their severity). This option permits a combined weighting of individual scores which would result in a summary score representing the total magnitude of the positive and negative features of the proposed development.

A central feature of the performance standards system is that it permits flexibility in responding to deficiencies which are detected for any proposed development. If, for example, a development was adjudged to be critically deficient in terms of the loss of land surface which is used in recharging the groundwater supply through the infiltration of rainfall, the developer might propose a configuration of land development which would reduce the amount of impervious surface in the development and would assure the provision of groundcover which would promote recharge; such assurances could be found to result in a development whose performance is within the standards of acceptability.

This piece of proposed legislation was also killed in committee. It will be considered again later in this report.

Constitutional Convention Proposals

The 1978 Constitutional Convention had before it several proposals for changing the land use management system in Hawaii. Some of these proposed to radically alter the procedures of the Land Use Commission. Two of these proposals (Proposal Nos. 336 and 588) would have the LUC amend land use district boundaries only once every five years, without a provision for amendments during intervening years. This is a reaction to the current procedure of the LUC which permits petitions for boundary amendment at any time and no longer has a statutorily imposed requirement for boundary review at regular intervals. (Note: The five-year boundary review provision of the Land Use Law was repealed in 1975.)

It is interesting to note that some delegates to the Constitutional Convention have considered it necessary to incorporate detailed prescriptions for the way in which the LUC would function in their proposals, although such detail is customarily relegated to statute, rule, and regulation and not to the State Constitution.

Interpretation of These Proposed Changes

The proposals for changing the Land Use Law which were cited above--and others--suggest that there is a need to examine the adequacy of the Law. These proposals also indicate that there is no apparent agreement on what type of changes should be instituted; they range from the total removal of the LUC's discretion in certain situations (enactment of pre-decisions) to a preservation of the LUC's discretion under an expanded set of guidelines. Many of these proposals were stimulated by the knowledge that the interim guidelines under which the LUC had been operating were set to expire with enactment of the State Plan. However, the absence of a comprehensive set of guidelines for the LUC in the State Plan and the failure of the legislative proposals mentioned above confronted the 1978 Legislature with the possibility that the LUC would henceforth function without explicit guidelines other than those found in other statutes. As a consequence, the interim guidelines were extended until 1980. Obviously, this is a stop-gap measure. This suggests that it is both appropriate to review the matter of decision-making criteria for the LUC and necessary to undertake that review in the immediate future.

The New Element: The Hawaii State Plan

Act 100, the state planning legislation enacted by the 1978 Legislature, provides the institutional and policy context for Hawaii's growth management. The Act mandates a "statewide planning system" which explicitly includes state functional plans, county general plans, the state program appropriations process, state capital improvements appropriations, the budgetary review process conducted by the Department of Budget and Finance, land use regulatory decisions made by the Board of

Land and Natural Resources and the Land Use Commission and, finally, a Policy Council.^{29/}

At the center of this "planning system" are the "overall theme, goals, objectives, policies, and priority directions" incorporated into Act 100. These elements provide the policy content upon which other state and county plans are to be based (see the section on policy context below).

The "statewide planning system" can be thought of as including a policy apparatus, a planning apparatus, an implementation apparatus, and a monitoring apparatus. Except for the policy apparatus which is discussed in a subsequent section, each of these elements is discussed below.

The Planning Apparatus in the State Plan

The planning apparatus includes state functional plans and county general plans. According to Act 100, state functional plans "shall be prepared for, but not limited to, the areas of agriculture, conservation lands, education, energy, higher education, health, historic preservation, housing, recreation, tourism, transportation, and water resources development."^{30/} State functional plans are to be prepared by the "state agency head primarily responsible for a given functional area" in consultation with an advisory committee appointed by the Governor and "respective officials and people of each county."^{31/} Act 100 states that "state functional plans shall define, implement, and be in conformance with the overall theme, goals, objectives, policies, and priority directions" contained in the Act.^{32/} Furthermore, "(c)ounty general plans and development plans shall be used as a basis in the formulation of state functional plans."^{33/} There is some acknowledgment in Act 100 that the functional plans may conflict with county general plans. When such conflicts cannot be resolved, "the policy council shall prepare a report to the legislature citing the differences and the justification for each of the conflicting positions together with recommendation."^{34/} Functional plans are to be submitted to the Legislature by the Policy Council for review, modification, and adoption by concurrent resolution.^{35/}

Act 100 also requires that county general plans be consistent with the "overall theme, goals, objectives, policies, and priority directions" of the Act by January, 1982.^{36/} County general plans or development plans "shall indicate desired population and physical development patterns for each county and regions within each county."^{37/} In addition, Act 100 states that the "(f)ormation, amendment, and implementation of county general plans or development plans shall utilize as guidelines, statewide objectives, policies, and programs stipulated in state functional plans adopted in consonance with this chapter."^{38/}

The Implementation Apparatus of the State Plan

The implementation apparatus refers specifically to those mechanisms so designated by Act 100, including:

- the appropriation of funds for major programs under the biennial and supplemental budgets;
- capital improvement projects and plans;
- the budgetary review and allocation process of the Department of Budget and Finance;
- state plans;
- decisions by the Land Use Commission;
- decisions by the Board of Land and Natural Resources.^{39/}

Act 100 requires that decisions and appropriations be "in conformance with the overall theme, goals, objectives, policies, and priority directions contained within this chapter."^{40/} This section of the law also specifies that the appropriation of funds for capital improvements and decisions by the Land Board and the Land Use Commission must be consistent with functional plans adopted pursuant to the law.^{41/} In addition, rules and regulations adopted by both the Land Board and the Land Use Commission "shall be in conformance with provisions of this chapter."^{42/}

Another mechanism in the implementation apparatus is the A-95 state clearinghouse process. Circular A-95 issued by the federal Office of Management and Budget mandates the coordination of state and local comments on designated federal projects. Act 100 requires the state A-95 clearinghouse to "coordinate the review of all projects requiring federal funding" and to "notify the policy council of all proposed federal projects which conflict with this chapter, any functional plan adopted under this chapter, or any county general plans or development plans which are in conformance with the provisions of this chapter."^{43/}

The Monitoring Apparatus in the State Plan

The monitoring apparatus includes both the Policy Council and the Legislature. Act 100 mandates an "overall review coordination and evaluation process."^{44/} The need for such a coordination and evaluation process is apparent. Act 100 is far-reaching both in terms of the degree of consistency that is required between the law and individual plans and programs and in terms of the sheer number of planning, programmatic, regulatory, and budgetary processes that must be coordinated. Some conflicts between the objectives, goals, policies, and priority directions in the Act and specific plans, budgetary or regulatory decisions are perhaps inevitable. To deal with such conflicts, the Act mandates the formation of a policy council composed of eighteen members,

nine of whom are appointed by the Governor from lists submitted by the mayor of each county and nine who represent state or county agencies.45/

The Policy Council is to "provide a forum for the discussion of conflicts" between the act and functional plans, county general plans, development plans, and state programs.46/ Findings and recommendations on all such conflicts are to be reported to the Governor, the Legislature and the mayors and legislative bodies of each county.47/

While these responsibilities for conflict identification and resolution are the most prominent of the Policy Council's duties, there are other monitoring and evaluative responsibilities. The Council is to "review and evaluate state functional plans for conformance with the provisions of this chapter. . . ."48/ The Policy Council is required to "advise the legislature on the administration, amendment, and review of this chapter."49/ They are specifically required to conduct a "comprehensive review" of the overall theme, goals, objectives, and policies every four years and of the priority directions during odd-numbered years to coincide with state budget process commencing in 1981.50/ The Council is also required to prepare an annual report which is to contain an "assessment of progress," an "assessment of legislation and programs of the preceding calendar year that have major statewide or county-wide impact in terms of their consistency with this chapter," and "recommendations to further implement this chapter" and to improve coordination within the planning system.51/

While the monitoring and evaluative role of the Legislature is implicit in their budgeting and lawmaking responsibilities, one explicit role has been written into Act 100. Functional plans prepared by state agencies are to be reviewed, modified, if appropriate, and adopted by the Legislature by concurrent resolution.52/ Act 100 specifically states that "functional plans shall not be used as a guide or to implement state policy unless said plans shall have been approved by the legislature."53/ Moreover, "the legislature, upon a finding of overriding statewide concern, may determine in any given instance that the site for a specific project may be other than that designated on the county general plan. . . ."54/

The Policy Context of State Growth Management

The policy context of the State Plan is to be found in the overall theme, goals, objectives, policies, and priority directions found in Act 100. Act 100 identifies three "principles or values" as constituting the overall theme of the State Plan: "Individual and family self-sufficiency;" "social and economic mobility;" and "community or social well-being." Three state goals are identified including "a strong viable economy," "a desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness . . .," and "physical, social, and economic well-being. . . ."56/

Objectives and policies are listed in Act 100 for population; economy in general; agricultural economy; visitory economy; federal expenditures; potential growth activities; land-based, shoreline, and marine resources; scenic, natural beauty, and historic resources; land, air, and water quality; facility systems in general; solid and liquid waste facility systems; water facility systems; transportation; energy and utilities facility systems; housing; health; education; social services; leisure; individual rights and personal well-being; culture; public safety; government; and fiscal management.57/

These objectives and policies vary somewhat in the level of generality in which they are expressed. Most of them, however, are not sufficiently specific to provide clear-cut guidance in regulatory decision-making or budget allocations. For example, the objectives for land, air, and water quality are "(m)aintenance and pursuit of improved quality in Hawaii's land, air and water resources" and "(g)reater public awareness and appreciation of Hawaii's environmental resources."58/

Representative policies for achieving these objectives are to "foster educational activities that promote a better understanding of Hawaii's limited environmental resources" and "promote the proper management of Hawaii's land and water resources."59/

The most specific policy guidance in Act 100 is to be found in the section on priority directions. Priority directions are defined as "overall direction and implementing actions. . . ."60/ Priority directions were developed for the economy, population growth and distribution, and land resources. Some of these priority directions relate directly to growth management and are therefore worth quoting more fully:

Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired level of growth in each geographical area.61/

Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures. Secondly, encourage urban growth away from areas where other important benefits are present, such as protection of valuable agricultural land or preservation of life-styles.62/

In order to preserve green belts, give priority to state capital expenditures that encourage locating urban development within existing urban areas in accordance with the following: funding for transportation activities that serve the needs of existing urban areas; allocation of

water for urban uses to areas within urban areas, and wherever possible, locate state buildings and facilities within urban centers close to public transportation; except where compelling public interest dictates development of a non-contiguous new urban core.63/

Direct future urban development away from critical environmental areas or impose mitigating measure so that negative impacts on the environment would be minimal.64/

While not inclusive of the entire set of growth management-related policies, these "priority directions" provide a sense of both the types of concerns expressed and the level of specificity.

Act 100 was not, however, the only piece of legislation enacted in 1978 with implications for state growth management. Act 166 amended the Land Use Law by providing that the interim land use guidance policies shall remain in effect until 1980 when measures to implement the State Plan become operational.65/

The interim policies are:

- (1) Land use amendment shall be approved only as reasonably necessary to accommodate growth and development, provided there are no significant adverse effects upon agricultural, natural, environmental, recreational, scenic, historic, or other resources of the area.
- (2) Lands to be reclassified as an urban district shall have adequate public services and facilities or as can be so provided at reasonable costs to the petitioner.
- (3) Maximum use shall be made of existing services and facilities, and scattered urban development shall be avoided.
- (4) Urban districts shall be contiguous to an existing urban district or shall constitute all or a part of a self-contained urban center.
- (5) Preference shall be given to amendment petitions which will provide permanent employment, or needed housing accessible to existing or proposed employment centers, or assist in providing a balanced housing supply for all economic and social groups.

- (6) In establishing the boundaries of the districts in each county, the commission shall give consideration to the general plan of the county.
- (7) Insofar as practicable conservation lands shall not be reclassified as urban lands.
- (8) The commission is encouraged to reclassify urban lands which are incompatible with the interim statewide land use guidance policy or are not developed in a timely manner.66/

Scope of This Study

The set of possible improvements in the growth management capability of the land use management system is extremely large. The constituencies that have some involvement in land use processes include land developers, landowners, users of land in its current state (e.g., agricultural interests), potential users of land in future uses (e.g., potential owners of houses on land now in agricultural use), land use decision-making bodies, environmental regulatory agencies, private interest groups (e.g., environmental conservation groups), and others. These many factors express values which are frequently competing. That is, any land use decision inevitably violates some of the values held by these groups.

The scope of this investigation is necessarily relatively narrow. It is concerned with the role of the government of the State of Hawaii in growth management, and particularly with its function as a broker among the competing values expressed by the many constituencies concerned with land use. More specifically, this study is concerned with the role of the Land Use Commission as a principal agent of land use and growth management for the State. The first major aspect of this study, then, is to investigate and demonstrate means by which the resolution of competing values can be accomplished in LUC decisions. This part of the study must necessarily consider how the many types of information pertinent to such complex decisions can be integrated.

The second aspect of this study deals with another dimension of decision-making of the LUC. A given land use decision can be based on a broad range of information and still be narrow in other respects. Such narrowness is principally evident in two forms: (1) the decision might not adequately consider the implication of the land use change on the surrounding region; and (2) the decision might not take into account other land use changes which might follow it, the cumulative effect of which might be more significant than the single decision. Land use decisions exhibiting either of these two characteristics can be termed "ad hoc." A growth management program is hindered if it is strongly based on ad hoc decisions because it cannot be long-range or geographically comprehensive.

The Land Use Commission has exhibited ad hoc decision-making. While there has been no legal restriction placed on it which would require it to be ad hoc, a set of procedures evolved under its former chairman which resulted in consistent treatment of information in an ad hoc fashion. Changes in this aspect of LUC procedures require careful examination.

ANALYSIS OF ALTERNATIVES

In this section, several alternatives for changing the administration of the Land Use Law are explored. Each of the five proposals contained in this section responds somewhat differently to the concerns discussed in the previous section about the ad hoc nature of Commission decision-making, the broad discretion exercised by the Commission (and the resultant inconsistencies in decision-making), and about the lack of growth guidance provided by the Commission as it currently operates. The specific proposals are:

- (1) guidelines revision;
- (2) a performance standards system;
- (3) a regional environmental assessment system;
- (4) a regional sketch plan; and
- (5) a system for consolidated review of boundary amendment petitions.

The proposals are conservative in the sense that they recognize the central role in growth management played by the Commission and propose changes in Commission operations rather than abolishing the Commission or designing an alternative land management system as has been proposed by some.

The discussion of each alternative is divided into several sections. For each alternative there is a rationale which identifies the major purpose and central features of the alternative. This is followed by a section on the mechanics of the method which provides information about the attributes of each alternative and how it would be implemented. Of particular importance in this section is the discussion of how each alternative departs from existing Land Use Commission practice and procedure.

The discussion on each alternative also contains a section on the organizational responsibilities inherent in that alternative. Of particular importance is the identification of changes in the current

distribution of administrative authority. Each alternative also involves somewhat different analytic requirements. Each alternative involves different emphases about the scale of planning analysis and the specific impacts for which predictive capability would be required.

The design of each alternative is based on a set of assumptions about the planning environment in which the alternative would be implemented. These assumptions are identified for each alternative. In addition, any changes in legislation that would be required to implement the alternative are identified.

All the alternatives discussed in this section share at least one characteristic: They are designed to provide a bridge or linkage between the general goals and policies of Act 100 and the specific decisions with which the Commission is faced. In a land management system, that linkage can be provided either by developing maps based on the general statements of policies or by developing more specific statements of policy that can serve as decision guides on petitions before the Commission.

One of the alternatives--the regional sketch plan option--seeks to provide the critical linkage using mapping techniques. Two of the other alternatives are explicitly based on some variant of the policy specificity approach.

The policy specificity approach is based on the recognition that there is a hierarchy of policy prescriptions ranging from general to specific. Developing specific policy guides first requires a determination of the desired outcome condition which is explicit or implied in the general statement of policy and then developing several increasingly specific policy guides which could be used to achieve the desired outcome condition.

For example, Act 100 contains the following prescription: "Encourage urban developments in close proximity to existing services and facilities." The explicit desired outcome in this case is proximate urban developments. Implicit in this outcome condition is a concern about the fiscal costs of new development. More specific policy guidance with regard to this issue was provided by a guideline proposed by DPED during the 1978 legislative session:

Land shall be reclassified to the urban district only when there will be no significant adverse impact on existing public services and facilities as are necessary can be provided in accordance with the long range plans of, and with no unreasonable burden upon, the fiscal and other resources of the appropriate agencies.^{67/}

Note that this guideline, while more specific than the general policy statement from Act 100, still requires that significant value judgments be made by the Commission. The Commission must still determine whether

a "significant adverse impact on existing public services and facilities" will occur or whether the fiscal impacts constitute an "unreasonable burden." For purposes of our discussion, such guidelines which leave significant value judgments to the Commission will be termed "judgmental guidelines."

It is possible, of course, to construct policy guidelines that provide more explicit guidance to the Commission on this issue. Thresholds can be set which provide rather precise guidance about whether a specific petition qualifies with regard to a particular standard or who should bear the fiscal costs. Using water as an example, the following statements represent examples of performance standards:

The estimated cost per household for operation and maintenance of the water distribution system (wells, mains, etc.) required by the development shall not exceed the average total operating and maintenance cost per household for public water service in the county by more than 10 per cent.

Pro rata costs shall be borne by the developer for construction or improvement of the water distribution system (without provision for reimbursement from water sales revenues).

Such performance standards provide the most specificity. It should be noted, however, that the standards in these statements are arbitrary (although, of course, they could be made less arbitrary). Moreover, they leave little room for discretion or flexibility.

This issue of how best to provide the linkage between general policies and specific decisions is important in assessing the alternatives that follow.

GUIDELINES REVISION

Rationale

The Land Use Commission has operated under a specific set of "guidance policies" since 1975. These guidance policies, or guidelines in our nomenclature, were adopted by the 1975 Legislature as part of a major revision to the procedures of the LUC. Prior to that time, less specific guidance was provided by legislation to the LUC. The 1975 guidelines were termed "interim guidance policies," since the legislation creating them called for their being replaced by "permanent" guidelines upon enactment of the Hawaii State Plan.

The Hawaii State Plan (Act 100, SLH 1978) does not itself contain a specific section with guidelines for the Land Use Commission. However, as explained earlier in this chapter, Act 100 does provide a hierarchy of objectives, policies, and priority actions to which the LUC is to adhere. Some of the priority actions, in particular, are as specific as the "interim policy guidelines" in terms of their significance to LUC decision-making. Nevertheless, the Legislature apparently concurred with others in thinking that the guidance provided by the Hawaii State Plan would not be sufficient for the Land Use Commission. As a consequence, the "interim guidance policies" were extended for another two years. This action was considered especially necessary in light of the failure of passage of a revised set of guidelines drafted by the Department of Planning and Economic Development, which would have met the mandate of the 1975 legislation creating the interim guidelines.

Thus, the issue of guidelines for the Land Use Commission is still unresolved. The LUC has adapted itself to operating under some form of guidelines, providing for a strong interpretive and judgmental role for the LUC. Yet those guidelines under which it was operating (the "interim" guidelines) were deemed by the Legislature to be unsatisfactory for permanent application. Furthermore, a major attempt at their revision failed. This suggests that a serious effort might be made at creating another set of guidelines for the LUC. Such revision, as difficult as it may appear, is nevertheless the most conservative modification that can be made to LUC procedures, save doing nothing whatsoever. However, even the do-nothing alternative would result in significant change in 1980, when the interim guidelines again lapse.

An unresolved issue is how any set of guidelines, including the interim guidelines now in effect, is to relate to the provisions in the Hawaii State Plan. There are really two sets of guidelines with which the LUC must concern itself--those in the State Plan and those specifically created for the LUC. It is not clear how this multiplicity of guidelines might be interpreted ultimately. However, it suggests that a single set of guidelines, drawn from the multitude of concerns expressed in the State Plan and from the interim guidelines be formulated and promulgated in the form of regulations by the LUC. The purpose of this would be to clarify the basis of LUC decisions, since the set of considerations is now so large that it does not in fact provide effective guidance to the Commission.

These revised guidelines would, in effect, be an interpretation of the principal pieces of legislation which serve as the basis of LUC action: the Land Use Law, including the interim guidelines, and the Hawaii State Plan. It would distill the many considerations of those laws into a manageable set of guidelines which would be addressed in hearings before the Commission and would provide the basis for the findings of fact which results from those hearings.

Mechanics of the Method

Description of the Process

Development of Guidelines.

(1) Analyze State Plan for Elements Relevant to Guidelines. This initial stage of analysis would be concerned with taking an inventory of provisions of the State Plan which would be relevant to LUC decision-making. An example of such a relevant provision is:

Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures. Secondly, encourage urban growth away from areas where other important benefits are present, such as protection of valuable agricultural land or preservation of life-styles.^{68/}

These provisions would then be categorized according to their applicability, such as their role in guiding decisions on petitions for reclassification of land into the various land use classes (urban, agricultural, conservation, and rural).

The intent of each provision should also be clarified, since some provisions might be duplicative and they could be consolidated into major categories.

(2) Draft the Guidelines. Guidelines would be drafted based on the provisions grouped into each category of concern in the previous step. The utilization of guidelines as a basis for LUC action presumes that the guidelines provide for some discretion on the part of the Commission. That is, the guidelines need not provide hard-and-fast decision criteria or standards for decision-making. Nevertheless, every effort should be made to make the guidelines clear and unambiguous.

The set of guidelines should be no larger than is absolutely necessary; that is, it should be a distillation of the large set of goals, objectives, and policies on which it is based. What results is essentially a two-tiered system: (1) specific guidelines flowing from this analysis; and (2) the laws on which the new guidelines are based and to which resort may be made if the guidelines are not sufficient in any particular decision-making situation.

(3) Adoption of the Guidelines. The draft guidelines would then have to be reviewed and submitted either for legislative enactment or adoption as regulation by the LUC. These options will be discussed further below.

Utilization of the Guidelines.

Once the revised guidelines are in place, they would be utilized by the Land Use Commission in a manner similar to how the interim guidance policies have been used. That is, they would suggest to petitioners what type of information is usefully introduced in boundary amendment proceedings and would signal the important concerns that would have to be addressed in coming to a decision. They would continue to provide the LUC with the opportunity for exercising its judgment; that is, they would not be as restrictive as would performance standards.

Organizational Responsibilities

Analytic responsibility during the guidelines development phase would lie with the Land Use Division of the Department of Planning and Economic Development. Once the revised guidelines were in operation, responsibilities would be unchanged.

Analytic Requirements

The program of guidelines revision would require analytic capabilities in the form of judgment, interpretive ability, and careful, reasoned editing. These capabilities are currently found within the Land Use Division. The review process would provide for augmenting these skills with those of outside reviewers.

Major Assumptions

The essential assumption of this approach is that land use decision-making based on guidelines can be effective in terms of the diverse issues which must be addressed by the Land Use Commission. Many have challenged this assumption in the past, citing as evidence inconsistencies and ineffectiveness in LUC decision-making with respect to the basic intent of the Land Use Law. These charges, of course, can be countered by arguments that the LUC is the arbiter among a wide range of interests.

An additional assumption is that the complete set of considerations embodied in the Land Use Law and the Hawaii State Plan which now impinge on LUC decision-making is too broad to effectively be internalized by the LUC. The new element here, of course, is the State Plan, which has overlaid an extensive set of considerations on what formerly was a tidy set of guidelines--the interim guidance policies. If, in fact, the LUC can address all these issues in its decisions, guidelines revision will be unnecessary.

Finally, it is assumed that general agreement can be reached on a reduced set of guidelines, based on the larger set, without creating a legislative or litigious monster.

Examples Where the Method Has Been Used

The Department of Planning and Economic Development has attempted to have new guidelines adopted, but was not successful.

Legislative Requirements

Revised guidelines must recognize the reality of existing laws and regulations which they would supplement or supplant. This means they would themselves have to obtain sufficient legal status to assure that decisions based on them are defensible. The Legislature might take the step to clarify the relationship between the interim guidelines, which have been given life until 1980, and the many provisions of the State Plan which bear on LUC decision-making. This could be in the form of a resolution directing the Land Use Commission to interpret the many guidelines confronting it in some particular fashion or it could be in the form of legislation which itself organizes the many guidelines into some hierarchical arrangement.

The non-legislative approach would be for the Land Use Commission to revise its rules and regulations. Act 100 requires the LUC to review its rules and regulations.

Decision-making process of the state land use commission. The decisions made by the land use commission shall be in conformance with the overall theme, goals, objectives, policies, and priority directions contained within this chapter, and the state functional plans adopted pursuant to this chapter. The rules and regulations adopted by the land use commission to govern land use decision-making shall be in conformance with the provisions of this chapter.69/ (emphasis added)

As they currently stand, the LUC's regulations explicitly incorporate the interim guidance policies.70/ The mandate of Act 100 suggests that a major revision of this section is required. This is probably preferable to seeking a legislative reconciliation of the many guidelines and their relationships to one another. The Legislature has spoken.

Assessment in Terms of Major Growth Management Issues

It is difficult to design a set of guidelines that meets the test of comprehensiveness because such a set would necessarily be lengthy in order to cover the anticipated range of decision-making situations.

Moreover, any attempt at exhaustiveness is likely to result in contradictory guidelines. The guideline approach necessarily involves trying to identify major goals to be achieved in land use decision-making and expressing those goals in general language capable of a range of interpretations.

In the past, petitioners before the Land Use Commission have gone to great lengths to describe their proposed boundary amendments in ways that would make them consistent with existing guidelines. One of the difficulties of most current sets of guidelines used for land use regulatory purposes is that the level of generality at which they are stated makes it possible to interpret them in several ways. Moreover, they often include words and phrases such as "insofar as possible" and "whenever practicable." Such phrases make the exercise of discretion not only possible, but inevitable.

Unless guidelines are written for the Commission that specifically direct the Commission to guide the location of development into particular geographic areas and/or away from other areas or contain clear directions about the timing of development, the use of guidelines is likely to be more reactive than pro-active.

A PERFORMANCE STANDARDS SYSTEM

Rationale

A performance standard is a specified acceptable level of a particular consequence of some action. An important distinction between performance standards and use regulations is that the latter tend to specify how an activity is to be carried out, for example in terms of density, type of use, building heights, floor area, and setbacks. While the enforcement of performance standards may affect how an activity is carried out, the emphasis of performance standards is on the ultimate effects of an activity on the land and environment rather than on the causes themselves. As long as consequences are acceptable, the activity could be considered acceptable.

When used in industrial zoning to control noise, glare, and similar side effects, performance standards define acceptable levels of nuisance or "externalities" of the development rather than specifying acceptable uses. In meeting environmental concerns, they may specify maximum levels of stress to be imposed on natural resources by development. The nature of performance standards is summarized by Einsweiler, et al.:

As in all zoning, the concern is with side effects (or in economic terms, externalities) that are not taken into account by regular market transactions. Performance standards are a means of specifying acceptable levels of external effect and letting the market determine use as opposed to specifying precise uses that would produce acceptable levels of external effect.^{71/}

Performance standards can be and are used in a wide variety of situations. They are particularly suitable for application in land use regulation. A land use regulatory system employing performance standards requires the specification of standards and a procedure for enforcing decisions based on a determination of how proposed land uses comply with the standards.

A simple example will illustrate the potential application of the concept. A standard concerned with surface water runoff from a proposed land development might be: "The amount of water runoff from a site may not increase more than 10% above the level of existing runoff." A proposed land development could be approved if there is a prior determination, based on best available estimates, that the standard would be met; otherwise, the proposal would be denied. The standard does not itself determine what use can be made of the land; rather it specifies that the consequence of whatever use is made of the land must be maintained within acceptable levels. In fact, it provides the developer with considerable flexibility in structuring his proposal so that the standard can be met.

A land use regulatory system based on performance standards would employ any number of standards related to a set of consequences of concern. Hawaii could implement a decision-making system for the Land Use Commission based on performance standards. Many variations on this theme are possible; some will be explored here.

It is generally agreed that specific guidelines are desirable for land use decisions--guidelines that are specific without being restrictive, flexible without being vague. A system of performance standards provides a legislative and administrative framework for relating demands and capacities of various natural and social systems influenced by development. It also promotes a negotiation process as part of the decision-making system. Performance standards attempt to clearly define the capability of a community to absorb growth related to legally defensible health, safety, and welfare criteria.

Mechanics of the Method

Description of the Process

This discussion will concentrate on a basic performance standards system employing straightforward threshold standards. Subsequently, some attention will be paid to a variation which could employ a more sophisticated scoring system which assigns to anticipated consequences of an action scores which represent the magnitude of their impact.

The performance standards system would require two distinct stages: (1) specification of the system; and (2) operation of the system.

Specification of the System

There are three critical components of specifying the system.

(1) Determination of the scope of impacts (or consequences). This component is concerned with the specification of the substantive scope of the system. That is, what consequences of land use are of concern? As indicated in earlier sections of this report, there are many sources where these concerns are expressed which would be relevant for the Land Use Commission, including the Land Use Law, the Hawaii State Plan, the Hawaii Environmental Policy Act, and the Coastal Zone Management Program. This stage of development of the system would require screening such legislative mandates (and others) to identify those factors that could be developed into decision-making criteria. The attempt should be made to include factors that have measurable--and predictable--consequences. Examples are: amount of agricultural land of various productivity classes lost; deterioration in levels of service on downstream highways (congestion); and proportion of housing provided in the proposed project for certain income groups.

(2) Specification of standards. This component requires the specification of boundary levels of acceptability for each of the consequences of concern, as discussed above. For example, the State Plan contains the following policy statement:

Encourage urban developments in close proximity to existing services and facilities.^{72/}

Explicit or implicit in such policy statements is the achievement of some outcome condition. The identification of desired outcome conditions can then be used as a basis for constructing performance standards. Performance standards are more specific than the judgmental guidelines which were discussed earlier.

Performance standards designed to achieve greater efficiency in the delivery of public services or construction of facilities could take a variety of forms. For example, they could be based on the desired level of efficiency and on the desired distribution of costs. The following

examples provide a sense of how a generally-stated policy of promoting greater efficiency in public service delivery can be translated into performance standards:

Performance standard with respect to water:

The estimated cost per household for operation and maintenance of the water distribution system (wells, mains, etc.) required by the development shall not exceed the average total operating and maintenance cost per household for public water service in the county by more than 10 per cent.

Pro rata costs shall be borne by the developer for construction or improvement of the water distribution system (without provision for reimbursement from water sales revenues).

Performance standard with respect to sewers:

Pro rata costs shall be borne by the developer for connecting sewerage from the proposed development to the nearest sewage collector and for increasing the capacity of the collection system if necessary.

Note that these examples are designed to encourage developers to consider the efficiency issue in their economic analysis of the developability of a particular site by requiring them (and potential homeowners) to bear the costs of "inefficient" developments.

Performance standards can be constructed to reflect other policies as well. The following example refers to agriculture, for which there are several policy statements in the State Plan. The section of the Plan specifying objectives and policies for the economy contains a provision that "it shall be the policy of this state to . . . assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs."73/ To achieve this policy, a number of priority directions have been specified in the Plan including the following:

Seek to accommodate urban growth in existing urban areas while maintaining agricultural lands in agricultural designation.74/

Provide adequate agricultural lands to ensure the economic viability of the sugar and pineapple industries.75/

Seek to protect prime agricultural and aquacultural lands through affirmative and comprehensive programs.76/

. . . encourage urban growth away from areas where other important benefits are present, such as protection of valuable agricultural land . . . 77/

The explicit desired outcome in these policy statements is the increased viability in sugar and pineapple industries. A simple standard which achieves this objective might be the following:

Performance standard with respect to agriculture:

Lands with soil classified by the Land Study Bureau's Detailed Land Classification as Overall (Master) Productivity Rating Class A or B, and lands classified by the department of agriculture as prime agricultural land, unique agricultural land, and other important agricultural land shall be maintained in the agricultural district, once so classified.

Such a standard is an absolute prohibition and as such is not sensitive to particular situations in which it might be desirable to permit the redistricting of productive agricultural land. Some flexibility can be built into the standard by adding to it the phrase:

except where the Department of Agriculture can demonstrate that the loss of a particular land unit to agriculture would not be detrimental to the long-term agricultural productivity of the state.

Another priority action in the State Plan calls for planning "the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographical area."78/ The implicit desired outcome in this statement is the promotion of the compatibility of state and county plans and actions. An example of a performance standard to achieve this implicit goal is as follows:

Performance standard with respect to compatibility of state and county plans:

Lands shall be reclassified for any urban use only if the most specific county land use plan designates that land unit for the proposed urban purposes.

These examples indicate how it is possible to construct performance standards using the State Plan as a policy base.

Another important issue requires special attention. Any concern expressed in a simple statement of policy may not be simply translated into a performance standard. Some concerns--perhaps most--would require a number of standards. For example, a policy-level concern with housing would reasonably be manifested in different performance standards

relating to cost, quality, type, and location of housing; no single statement (or standard) could adequately specify what is adequate for all income groups. Similarly, other concerns, such as transportation, agriculture, and noise, would have to be expressed in multiple performance standards.

While this exercise of translating policy concerns into standards might be accomplished with sufficient time and other resources, the resulting compendium might include hundreds of performance standards reflecting scores of concerns. Two problems would confront the LUC in administering such a system. First, getting agreement on the entire set of hundreds of performance standards would be extremely difficult, if not impossible. And second, the administration of such a system would be exceedingly cumbersome.

If a performance standards system was being instituted without having to relate to an existing growth management system, such as has been the case in some jurisdictions, then developing a reasonably-sized set of performance standards would not be so difficult. However, the development of such a system in Hawaii would now have to relate to the scores of provisions in the Hawaii State Plan--provisions which have been only recently enacted after a considerable period of gestation.

(3) Determination of the use of standards in decision-making. The development of performance standards would have meaning only if it had some bearing on the decisions of the LUC. The standards could be employed in a variety of ways, from the very stringent to the more relaxed. Under a very stringent interpretation, the LUC would be empowered to deny any application that failed to meet the test of all standards. However, under this interpretation, allowance could be made for the petitioner to amend his petition so that the proposed development would have its impacts within acceptable bounds.

Under a more flexible system, a formal finding of the degree to which the proposed use would comply with the standards would be made a part of the LUC's record. The LUC might approve a petition if it did not comply with all the standards, providing the mitigating circumstances would be explicitly explained; without such explicit explanation, the concept of performance standards would have little meaning.

Another option would merely use the finding of non-conformance to standards as a device to flag the petition under consideration for special scrutiny. With this approach, petitions meeting all the standards could receive more streamlined approval, while others would get added attention.

Obviously, a variety of arrangements for utilizing performance standards in coming to a land use decision could be employed.

This and the preceding components would obviously require significant effort on the part of the Land Use Commission, assuming the LUC was responsible for developing the rules and regulations of which these

would be a part. This system would increase the visibility of the LUC's decision-making procedures considerably. Perhaps most significantly, it would require the pre-consideration and specification of decision-making criteria to an extent never experienced under the Land Use Law.

It should be emphasized, however, that such a system would not eliminate the role of judgment in the LUC's decisions. This system permits the expression of many growth management concerns in specific, measurable standards. However, there are some concerns which are not capable of such quantification. For example, the development of a particular land unit might technically meet the specified performance standards, but it might be determined that it runs counter to general guiding policies concerning the preferred direction of urban growth on the island. Not all judgments can be completely pre-determined. The performance standards system would permit the narrowing of the scope of these major judgments, however, while providing clearer guidance, understandability, and predictability in those areas where standards can be specified.

Operation of the System

(1) Prediction of impacts of the proposed use. The petitioner would, as part of his application, provide a prediction of the consequences of his proposed use for each of the areas of concern. This would be similar to what is now required of petitions before the LUC, but would be more focused in terms of the specific impacts which are reflected in the standards. The use of assertions by the petitioner, rather than analysis amenable to verification, would be minimized, because the performance standards would be limited to consequences capable of measurement. It would continue to be the LUC's responsibility to judge the petitioner's assertions regarding the consistency of his proposal with general objectives, policies, and priority directions, frequently without the possibility of rigorous analysis.

The staff of the LUC or of the Land Use Division (DPED) would evaluate the petitioner's predictions of impact. This review might be enhanced by providing for review by others, such as is permitted under the Environmental Impact Statement procedures. (Note: Generally, environmental impact statements are not required as part of applications for land use boundary amendments.)

Review of impact predictions is important because the state-of-the-art of impact prediction does not permit unambiguous results. A range of impact prediction methods is available for each impact, with each based on different assumptions and having different input data requirements. Each method will generally produce a prediction which is inherently imperfect, although useful.

(2) The finding of fact-relating impacts to standards. The LUC would make a finding as part of the hearing record regarding the compliance of the proposed development with the performance standards. Adjustments to the proposal could be made, with modified findings.

(3) The decision. The LUC would make its decision based on the findings. The decision might incorporate nonstandard-related findings, depending on the reliance made on performance standards compliance in the LUC's decision-making rules of practice.

A Variation

The preceding example provided for standards with fixed cutoff points; basically, they served as "on-off" switches. An alternative approach would provide a numerical score for various levels of each type of impact. Under this variation, a proposed development would be judged not in terms of whether it complied with each standard ("yes" or "no"), but in terms of the magnitude of each impact. The impact would be measured along an interval (continuous) scale (e.g., amount of acreage lost to agricultural production); a "score" would then be assigned depending on the magnitude of the impact. Decision rules would relate to the scores. For example, cutoff might be set for the minimum (or maximum) total score, representing the cumulative effect of all impacts under consideration. Such a procedure could explicitly permit the trading-off of some types of impact for others; that is, some benefits could offset costs because of the numerical summary of impact scores.

As noted above, such a system would not replace the LUC's role in applying judgment to petitions. In the first place, the LUC would be instrumental in specifying the performance standard scoring system. But, again, numerical standards might not be appropriate for all decision-making considerations; in other cases, considerable judgment and interpretation would continue to be required of the LUC.

Organizational Responsibilities

The Land Use Commission would continue much as it currently does, with the responsibility for hearing information in a quasi-judicial procedure and coming to a finding of facts in each case. However, its responsibilities would be augmented during the period in which the performance standards system would be incorporated into its rules. Both during this period and later, when the system is in operation, the LUC's staff would need to be expanded unless the process of reviewing impact predictions were expanded to include outside reviewers. The staff would have added responsibility for interpreting each petition in terms of its impacts; this would require considerable breadth in expertise.

In most respects, the performance standards system would require only minor shifts in responsibility among the various actors involved.

Analytic Requirements

A considerable amount of analysis--both quantitative and qualitative--would be required to make this system operational. Principal among the requirements are:

Determination of Scope of Standards.

This stage would require a thorough review of existing laws, a distillation of the objectives, policies, and priority directions of those laws into specific impacts of concern. Considerable judgment would need to be exercised, partitioning provisions of the laws into those which are capable of being transformed into specific standards and those which are not.

Specification of Standards.

Actual standards, or cutoff points, must be determined for each of the impacts included in the scope. A question requiring resolution in this regard is, what is the appropriate geographic and temporal scope of impacts? Some impacts are localized while others are very extensive. Some impacts are short-lived, while others are long-lasting. Some impacts, such as those on large public service systems (e.g., transportation systems), may exhibit all these characteristics. Therefore, some impacts of concern might require specification in the form of several standards. The generation of a set of standards which is complete enough to reflect legislative requirements while brief enough to be manageable would be difficult.

Prediction of Impacts.

The petitioner would be required to provide predictions of the level of each type of impact reflected in the performance standards unless the system specified that such predictions would be made by an agency of government (e.g., LUC staff or Land Use Division staff). This would require the provision of a wide range of analytic capabilities by all of these groups, regardless of who produced the original predictions, in order to assure all parties of the legitimacy of the predictions.

Requirements Under the Variation.

The variation of the system, discussed above, under which impacts would be scored, would have additional analytic requirements. This system would require: the specification of the appropriate range of scores for each impact (in some cases, both positive and negative scores would occur); a correspondence table (or function) relating impacts to scores; and, perhaps, a means by which scores could be pooled in order to arrive at summary impact scores. The latter possibility presents special analytic difficulty; it requires the specification of trade-offs among the pooled impacts. That is, the scales must be mutually consistent and additive. While there are examples where such a system have been implemented, the considerations embodied in those

systems have not been as extensive as existing statutes would require of a performance standard system in Hawaii.⁷⁹ Avoiding charges of arbitrariness in the scaling system would be difficult.

Major Assumptions

The first assumption of the performance standards approach is that a preponderance of land use impacts--those incorporated in the system--are quantifiable. If they are not, then the operational advantages of the system cannot be achieved. This also assumes a willingness on the part of those agencies and officials responsible for managing the system to subject what are usually general statements of public policy to scrutiny in the development of precise language and standards.

Assumed of the system is that it is possible to predict impacts both accurately and reliably. That is, that predictions do not deviate significantly from (eventual) observations and that predictions by the same assessor are consistent from one case to the next.

It is assumed that the indicator incorporated in the standard actually measures the "problematic" impact which the standard is intended to manage.

Finally, it is assumed that a critical level can be determined (the standard itself) which is defensible.

Examples Where the Method Has Been Used

Variations of the performance standard system are currently in use in several mainland jurisdictions. The best known systems are employed by Ramapo (New York), Marin County (California), and Petaluma (California). The Petaluma and Ramapo systems have survived prolonged court challenges. Further elaboration of these systems is provided in Lowry, et al.

Legislative Requirements

The suggestion that a performance standards approach to decision-making be adopted by the Land Use Commission is largely a consequence of the proliferation of legislative guidelines experienced in the last few years. There is a need to cut through the maze of objectives, policies, and priority directions and make them operational, if they are to have any meaning. The performance standards approach would require some added rule-making oriented toward the procedural aspects of the LUC's decision-making, but perhaps not toward the substantive aspects. The LUC would have to change its Rules of Practice and Procedure to incorporate performance standards in the pre-decision process. It would be required to address the issues addressed in the State Plan in its rules

at any rate, as specified in HRS 226-52(b)(2)(D). It might do this by specifying performance standards for those impacts of concern which are amenable to such analysis, while leaving those which are not amenable to standard specification to qualitative judgments of the LUC.

The system would also require appropriations for augmenting either the LUC staff or the Land Use Division staff or both, reflecting the increased demands on their analytic capabilities and workload.

Assessment in Terms of Major Growth Management Issues

As is the case with the guidelines revision alternative, a system of performance standards would not likely be comprehensive. A manageable system of standards could not realistically incorporate the hundreds of standards that would be required to adequately reflect the many concerns which are generally considered essential to land use decision-making at the level of the LUC. This results from the observation that a single concern might require several standards in order to be adequately addressed. For example, relatively simple statements like "provision shall be made for low-cost housing" cannot be simply expressed in the form of a single standard; several would be required, relating to different income groups and/or housing types.

The impact of performance standards on Commission decision-making discretion depends on the type and extensiveness of the standards and their role in decision-making (i.e., whether they are mandatory or advisory). It is possible, however, to design standards that greatly reduce the Commission's discretion and increase the likelihood that petitions involving similar land units will be treated consistently.

To the extent that the standards were applied to petitions initiated by landowners, the performance standards approach would still have to be described as basically reactive in nature. This is because standards would be constructed to guide development away from certain areas; development would not necessarily be guided toward more preferred areas.

A REGIONAL ENVIRONMENTAL ASSESSMENT SYSTEM

Rationale

Much land development in Hawaii has occurred on land units which obtained the necessary land use classification without being placed in

the context of a larger region. That is, the evidence that was considered as part of the decision-making process largely ignored the spillover effects of the proposed land use change on the community-at-large. Some actions that occur at a single site have repercussions that extend far beyond the boundaries of that site. They may affect the natural resource base, the people, and governmental expenditures in regions of varying extent--from the nearby community to the statewide level.

The Land Use Commission has frequently considered the merits and demerits of petitions for reclassification on the basis of the localized impacts on the site or in the near vicinity of the site. A consideration of impacts at some distance from the land unit has been minimized. An example in point is the case of the petition to reclassify nearly 500 acres of agricultural land in 1977 as part of the Mililani Town development on Oahu. Questions regarding the impact of the proposed development on water availability elsewhere in the region served by the same groundwater aquifer were shunted aside during the hearing in favor of the question of whether water was available at the site for the proposed development. This was in spite of the common knowledge that some deterioration in service was being experienced in the area served by the same groundwaters.

While the LUC has tended to limit its purview to narrow site or near-the-site considerations, it has done so without being so mandated by law. There is no reason why the LUC cannot broaden its perspective to consider regional impacts of its decisions. In fact a strong case can be made that, as a principal growth management agency of the State, it should be required to have this broader geographic perspective. Prior to 1975, the Land Use Commission undertook periodic reviews (every five years) of land use classification throughout the State, which took on a regional character. Nevertheless, "interim" reclassifications--those between five-year reviews--were still generally narrow in geographic perspective.

In order to incorporate regional considerations into its decision-making procedures, the LUC could modify its regulations in a fairly simple way. This would call for inclusion of requirements that petitioners answer a set of questions that represent a regional perspective.

The importance placed on regional analysis prior to such decisions has been recognized in the federal courts. It has been observed that

[i]t is apparent that geographically restricted site-specific environmental impact statements will not be sufficient to meet the requirements of the NEPA [National Environmental Policy Act], as recently interpreted by the courts and defined by the President's Council on Environmental Quality:

'The interrelationships and cumulative environmental impacts of the proposed action and other related Federal projects shall be presented in the (environmental impact) statement.'^{80/}

Of course, decision-making by the LUC does not involve federal projects in the typical case. But the observation quoted above does summarize a significant shift in thinking away from narrow considerations and toward the broad view. While some would hope that these issues could be addressed simply by a rigorous requirement for a divulgence and review of regional impacts in an environmental impact statement (EIS) as part of the petition application, an EIS is not required in the typical LUC reclassification process. Therefore, such requirements would have to be built into the LUC's own regulations.

The system that is proposed here would provide a shopping list of questions that have a regional orientation and which would have to be addressed as part of the land use boundary change application.

Mechanics of the Method

Description of the Process

Specification of the System.

This component is concerned with identifying the types of impacts to be considered and clearly specifying the questions to be asked of each type of impact. Impacts of concern are expressed in several pieces of legislation, including the Hawaii State Plan and the Land Use Law.

While there is a question of what region is the appropriate region to consider in assessing regional impacts, that turns out to be a manageable problem. There is no single region that is appropriate for the various concerns that ought to be addressed in a regional assessment system. Different types of development have varying regional impacts depending on the nature of the development, and different impacts have varying spatial expressions. Some developments and impacts might be highly localized; others will extend to larger areas which are still sub-areas of islands; and still others will affect entire islands or perhaps the state. Provision must be made for flexibility in the interpretation of "region."

Operation of the System.

The informational requirements of this system could be incorporated into existing procedures with only minor modification. Basically, the system would require a response by the petitioner to an expanded set of considerations included in the LUC regulations. The

expanded application would then be subject to the same type of review that it now receives. In addition, findings by the LUC with respect to the regional concerns would become part of the hearing record.

Organizational Responsibilities

Responsibilities for all parties in the process would remain as they are.

Analytic Requirements

What Kind of Information is Generated?

The following set of questions illustrate the way in which regional concerns can be incorporated into the informational requirements of the LUC's boundary amendment process. These questions are only representative of those which might be developed with the implementation of this system. They are not intended to replace questions which would otherwise be asked.

Of course, any assessment procedure is premised on having reliable methods of predicting the impacts under consideration. It can be anticipated that, over time, such methods will become increasingly sophisticated and reliable, analogous to the predictive tools that have been emerging in site-level analysis in recent years.

Following are several relevant areas of impact and some representative assessment questions.

(1) Transportation

What will be the system-wide impacts of the proposed development in terms of traffic congestion and the fiscal implications of those impacts?

(2) Water

What will be the impact of the proposed development on the availability of water within the entire water service area fed by the same groundwater aquifer? What would be the estimated cost of overcoming any deterioration in service?

(3) Agriculture

If agricultural land is being lost to the proposed development, what are the implications of that loss in the context of any other losses that may have occurred in the region on the long-term viability of agriculture in the region?

(4) Future Development

What implications does the proposed development have for future land use changes in the region?

(5) Historic/Cultural Resources

If there are historic/cultural sites on the parcel, how important are they in relation to other known sites?

How is the Information Used in Decision-Making?

The information generated would be used in the same manner as other information is now utilized by the Land Use Commission. The major revision in the decision-making process is the change in perspective regarding impacts of various proposals. This perspective should expand the amount of information generated during the process to enable the LUC to more carefully implement the State Plan and other policies through its decisions even in the absence of regional development plans. This system would increase the burden of proof on both the petitioner and any parties opposed to the boundary amendment.

Major Assumptions

The first assumption is that there is a realization among the LUC and other parties to land use decision-making that a regional perspective is necessary to the proper exercising of growth management responsibilities. No matter how strongly the rationale for such a perspective might be expressed, even in legislation, the intent can be thwarted if the individuals on the LUC do not exhibit this sensitivity.

Second, proper exercising of this proposal assumes that the procedure can be understood properly by all parties--as an information-generating procedure. As with the environmental impact statement procedure, what is suggested here is merely a set of questions which, if answered prior to decision-making, can enhance the quality of decisions by introducing into the record information which has not been present before. The answers themselves do not foreordain the decision in any instance.

Examples Where the Method Has Been Used

The proposal discussed here can be considered a refinement of standard procedures employed in environmental impact statement processes. It merely clarifies explicitly that such statements reasonably address issues of regional scope. (Hawaii's EIS regulations can generally be interpreted to avoid the regional scope, utilizing such wording as "in the vicinity of the action," "for the area affected," and "of the area in question."⁸¹)

However, some jurisdictions have more explicitly included regional considerations in their assessment requirements. Some of the best known among these are California, Oregon, and Vermont.

Legislative Requirements

There is nothing in existing State law that precludes the Land Use Commission's considering petitions in part on the merits of their regional impacts. State law is general enough to permit such considerations without compromising the intent of the legislation. So, one might argue, the LUC could simply raise questions of regional impact at the time of hearing any petition for land use boundary amendment. However, another approach which would more clearly establish the significance assigned to regional considerations is to amend the LUC's regulations, inserting language which specifies that the region shall be the appropriate scope of concern in the assessment of impacts. This would require no legislation, but would require adherence to regulation promulgation procedures.

Assessment in Terms of Major Growth Management Issues

The regional environmental assessment system is likely to be comprehensive with regard to the number and types of impacts considered when major boundary amendments are considered. In practice, the degree of comprehensiveness depends on: (1) the number and types of regional impacts which petitioners are required to identify; and (2) the definition of the region for each impact.

Regional environmental assessment is a mechanism for generating information. By making such information explicit, it may have an impact on the degree of discretion exercised by the Commission. As described here, however, the mechanism does not tie Commission decisions to findings of fact about regional impacts. The Commission could ignore potential impacts revealed by the process.

The regional assessment system would not enhance pro-active growth guidance particularly except to the extent that the process reveals potentially adverse consequences of development at a particular location and these potential impacts have a bearing on Commission decision-making.

A REGIONAL SKETCH PLAN

Rationale

Traditionally, land use planning has utilized maps as a device for communicating or legally describing which land units had been designated for various uses. Such "land use plans" have been the single most prevalent device for summarizing implicit and explicit growth policies. Increasingly, however, jurisdictions have legislated policies, goals, and guidelines which have been intended to supplant plan maps, which were seen as being incapable of providing flexible land use guidance for communities. "Policy plans" have replaced general land use map plans in a number of jurisdictions, including Honolulu. Other jurisdictions, such as the State of Hawaii, have developed sets of policies, goals, and guidelines with the intent of guiding growth without resort to a map.

Ultimately, growth as it occurs is mappable. This observation raises the question of why a jurisdiction, such as the State of Hawaii, does not adopt a map which delimits areas where growth is to occur. Such a plan map could assist the public in understanding where growth is expected to occur and could be a guide to decision-making bodies, such as the Land Use Commission, when they deliberate growth-producing actions.

There are two essential questions here: (1) How would the "plan" be developed? and (2) How would it be used? Obviously, such a state plan map could not be generated independently of the array of existing statutes and regulations which affect growth management. The map would appropriately be a reflection of those statutes and regulations. Basically, this "sketch plan" would be a two-dimensional illustration of governmental policies in map form. It would be an interpretation of which lands are targeted for growth and which are not, based on established legislation and regulation. Given the scope of existing laws and regulations, such a map would have to incorporate inventories of physical features, natural resources, urban infrastructure, and other factors. These different factors would be combined in composite maps to display various levels of land use suitability for urban use. The sketch plan would indicate the general timing, scale, and location of growth which can be expected in a given region within which an individual district boundary amendment petition is being considered by the LUC.

The sketch plan could be utilized by the Land Use Commission to identify acceptable locations for growth and to set priorities for them in terms of desirability, suitability, and potential impact. Determinations could be made as to the best locations for particular land uses, as well as the best uses of particular locations. Currently, the Land Use Law does not provide for making boundary decisions based on a mapped plan. However, it is not necessary that the sketch plan become an official map in the legal sense. It is suggested here that the sketch

plan serve as a guide to the LUC in its deliberations, that it be used to summarize a large number of statements of policy which are generally only vaguely expressed in words and interpreted in specific, localized contexts without reference to other statements of policy. The sketch plan could be used to bring together many considerations on a single sheet so that the LUC could better focus its responsibilities on critical questions regarding possible conflicts between a petition and established values.

Mechanics of the Method

Description of the Process

Inventory of Relevant Policies.

The initial stage of development of the sketch plan would involve making an inventory of specific policies in existing laws and regulations which have a bearing on land use decisions. For example, a section of the Land Use Law stating a preference for maintaining good agricultural land in that use would be included in the inventory. The principal laws to be analyzed are the Land Use Law (HRS, Chapter 205), the Hawaii State Plan (Act 100, SLH 1978), and the Hawaii Environmental Policy Act (HRS, Chapter 205). The specific intent of each policy would be determined.

Interpretation of Policies in Mapped Form.

Once the relevant policies were identified, each of them would have to be interpreted in terms of its implications for the use of land and other resources. Then each policy would be mapped to the extent practicable. On separate maps, for example, sites suitable for tourism facilities, areas suitably served by infrastructure, and locations of critical resources which are to be preserved would be delineated. In some instances, standards for identification of critical areas are reasonably well-established (e.g., the 100-year flood inundation zone); in other instances, standards would have to be developed or maps of varying sensitivity would have to be developed.

Summarization of Policies in Mapped Form.

The information mapped in the preceding step could be systematically combined for a variety of uses. It might be most practical to map each factor on transparent mylar film. Combinations of factors, when overlaid, would indicate: (1) the most desirable/suitable sites for future growth; (2) areas where there is potential conflict among policies; and (3) areas to be preserved in their natural state. This composite map is what would be referred to as the "sketch plan."

Use of the Sketch Plan in Land Use Decision-Making.

The sketch plan would basically be a descriptive device, illustrating a set of interpretations of existing policies. The sketch plan would not attempt to resolve conflicting policies or assess the compatibility of agency goals and plans. It would not be a zoning map, nor would it supersede the state land use district boundaries. The allocation of land to the various districts would continue to be made by the LUC based on its collective judgment of how land use policies should be interpreted.

The sketch plan could also assist the State Plan Policy Council in its evaluation of functional plans, county general plans, and land use district boundaries for their conformance to the Hawaii State Plan, a responsibility specified in Act 100, SLH 1978.

Organizational Responsibilities

Preparation of the sketch plan would appropriately be done by the Department of Planning and Economic Development, as part of its overall land use planning functions. Given the magnitude of the work that is implied, increases in staff would be required, at least until such time as the initial sketch plan were completed; updating the sketch plan would not require the staff commitment of the initial effort.

The structure and functioning of the LUC would not have to change. The LUC would simply have at its disposal this additional piece of information as a reference.

Analytic Requirements

The first analytic requirement is to determine the scope of policy factors which would be included in the sketch plan. These factors would be derived by screening existing laws and regulations. The fundamental laws to which attention should be paid are the Hawaii State Plan, the Land Use Law, and the Hawaii Environmental Policy Act, but there are many others. Some elements of the State Plan, most notably some of the functional plans, are not yet completed or adopted by resolution of the Legislature, as called for in Act 100. Many of these functional plans might also be expected to have a policy emphasis; since policies stated in those plans would also require interpretation in the sketch plan, it is important that these plans be completed.

Once the planning elements are completed, their land use implications must be determined. The boundaries of the extent of any policy consideration must be established. For example, a policy inhibiting urban development in areas subject to flooding requires further interpretation before it can be mapped. How much flooding (with what frequency) might be tolerated? Laws which state general guiding policies rarely are specific enough to answer such questions. Therefore, major

effort would be required for the identification of relevant criteria for inclusion of land based on the various policies--and on gaining acceptance or agreement on the criteria.

Conceivably, there could be scores of policies to be included in the sketch plan. How these many considerations can be effectively displayed is another serious analytic concern.

Another significant analytic consideration revolves around the degree of specificity of the sketch plan. Is it possible for it to be done in a very detailed fashion, on small-scale maps with definite boundaries? Or would that level of detail only mask the arbitrariness which is inherent in establishing almost all boundaries of this sort, suggesting that it would be more appropriate to have a sketch plan with "fuzzy" lines? If the latter were to be the situation, of what use would the sketch plan be? Clearly, this is a situation potentially requiring the handling of vast amounts of information, embodying a large number of analytic judgments which nevertheless could have very significant consequences for petitioners before the LUC. Based on this information "overload" and the undesirable possibility of such a sketch plan becoming an unknowable or misunderstood "black box," perhaps the first analytic requirement of the system would be a test to demonstrate the utility of the approach.

Major Assumptions

The fundamental assumption in considering the sketch plan approach is that the various policies expressed in the State Plan, functional plans, and so on, will in fact be mappable.

It is also assumed that a large number of policies--once mapped individually--can be overlaid in such a fashion that the composite has significance and can be understood by the Land Use Commission.

Examples Where the Method Has Been Used

There is a considerable body of experience with the mapping and overlaying of sets of maps, each of which displays the geographic extent of some concern. McHarg is perhaps best known for work in this area, which has gained considerable popularity since publication of his book Design With Nature.^{82/} The procedure was also applied in Hawaii in the Central Oahu Planning Study.^{83/}

While the overlay technique is well-tested, no examples are known where extensive analysis of policies as numerous and complex as those implied in the present case has been undertaken leading to their eventual representation in mapped form. This is untested ground.

Legislative Requirements

In part, because of the level of analytic effort--and hence resources--that would be required to operationalize a sketch plan and, in part, because of the visibility and importance that such a sketch plan would gain, legislative and procedural modifications would be required. Act 100 would have to be amended to incorporate references to the sketch plan as a representation of the land use element of the Hawaii State Plan and functional plans (and perhaps as a means for the evaluation of Plan conformance). Changes in the Land Use Commission's rules could also specify the manner in which the LUC would utilize the information embodied in the sketch plan and how petitioners would be directed to address the sketch plan in their applications.

Assessment in Terms of Major Growth Management Issues

The regional sketch plan alternative has the potential of providing for a great deal of comprehensiveness in Commission decision-making. The degree of comprehensiveness depends on how many factors are seen as having a bearing on development in the region and are therefore incorporated in the sketch plan. It should be noted, however, that while the sketch plan is comprehensive at the regional (or sub-island) scale, it would not be used for inter-regional comparisons about the location of growth.

To the extent that the sketch plans are regarded as the embodiment of the State Plan and state functional plans, they could greatly circumscribe the decision-making latitude of the Commission. Perhaps the greatest weakness of the sketch plan is that it does not necessarily reflect private sector preferences. Hence, there would be little incentive for the private sector to follow the plan.

Sketch plans are, by their nature, pro-active. They explicitly suggest how to direct growth to particular areas and away from other areas. To the extent that they incorporate the other planning elements of the state plan they would be much more pro-active than any of the other guidance mechanisms reported here.

However, there is the possibility that the sketch plan would be the result of a technical exercise in interpretation by professional staff not subject to sufficient external review. The State Plan is, in general, a move away from the plan-as-map notion and toward the plan-as-policy document notion. The sketch plan might be seen by some as a regression, but could provide a bridge between general policy and specificity.

A SYSTEM FOR CONSOLIDATED REVIEW OF
BOUNDARY AMENDMENT PETITIONS

Rationale

The Land Use Law, as originally conceived, provided for two boundary amendment processes. The first of these--and the one which appeared most significant in the original version of the law--was the five-year boundary review. The five-year review was intended to provide the opportunity for taking the broad view of land use change and requirements throughout the state. This broad view, it was thought, would lead to a comprehensive and pro-active stance on the part of the State in determining future growth patterns. The second boundary amendment process, which was intended originally to be subsidiary to the first, provided for amendment by petition of private parties, generally landowners interested in having their land developed in urban use. Over time, the privately initiated boundary amendment process became more and more significant; ultimately the five-year review was repealed, and with it the mandate for the LUC to simultaneously consider the land use changes that occur incrementally when initiated by the private sector.

By shifting away from the five-year boundary review, the LUC has lost the opportunity to control growth in the pro-active sense. It now can only react to petitions. (In fact, it has the authority to initiate boundary changes itself, but has not actively pursued this option.) This makes decision-making easier in one sense: the LUC can narrowly circumscribe its range of concerns when considering any particular petition. But this procedure makes it virtually impossible for the LUC to consider the cumulative ramifications of a series of land use boundary amendments. It is questionable whether, as a principal growth management agent, the LUC can continue to operate in this mode.

Proposals have been made to reinstitute the five-year boundary review--and even to strengthen it. Constitutional amendments have been introduced in the 1978 Constitutional Convention which would not only mandate that review, but would preclude any interim boundary amendments. The sentiment expressed in these proposals is one that argues for a comprehensive, pro-active state role in land use decision-making.

The version considered here, which will be termed "consolidated review of boundary amendment petitions," is more conservative than some proposals. This alternative provides for the grouping of petitions, privately initiated, by county, for simultaneous consideration and decision-making by the LUC. Each county would have the opportunity for boundary amendments only once every four years, on a staggered basis. Petitions would not be considered during the intervening years, except in very restricted circumstances, but would accumulate until the next review period for that county. The county is used as the unit for accumulation of petitions since, it is argued, the cumulative impacts of land use changes are most strongly felt within the single county.

This alternative presents some very significant changes to land use decision-making in Hawaii. It would, no doubt, evoke serious legal challenges by landowners who feel deprived of the use of their land while awaiting Land Use Commission action. This is one of the costs of obtaining a decision-making mechanism by which cumulative effects can be considered while still basing land use changes on privately initiated petitions.

Mechanics of the Method

Description of the Process

Petitions before the Land Use Commission for boundary amendments would be heard once every four years in each county. A variation would provide for more frequent consideration of petitions for other than urban designation, since the principal impetus for the simultaneous review proposal is the cumulative impact of petitions for urban designation. No petitions would be heard during the interim period.

Each county would follow a staggered cycle with the following elements:

A Six-Month Review Period.

During this period the LUC staff would conduct an analysis of undeveloped urban lands and land which appears to be inappropriately classified. This information would serve as a basis for petitions initiated by the LUC for reclassification. At the same time, and in partnership with the county planning department, the LUC staff would prepare a written summary of needs and constraints related to land use in the county (e.g., population projections, economic and housing needs, infrastructure).

A Three-Month Period for Receiving Petitions.

A period of three months' duration would be used to accept petitions for boundary amendments from the private sector. This period would be preceded by an informational program notifying potential applicants that if they desire reclassification of their land within the succeeding four-year period, they should prepare their petitions for submission. As petitions are received, the LUC staff would make certain that filing requirements are met and, if they are not, specify what additional information is required.

A Three-Month Review Period.

In the following three-month period, all petitions would be reviewed. Each petition would be sent to the appropriate county planning department which would solicit and consolidate comments and recommendations from relevant county agencies. The State Department of

Planning and Economic Development would serve a similar function at the state level. The LUC staff would analyze the cumulative impacts of all petitions by county and by sub-regions within the county when appropriate. The staff would construct alternative scenarios of growth, based on different combinations of the petitions before it, and analyze them in terms of their contributions toward meeting county planning objectives (provision of housing, for example) and their cumulative impacts.

A Six-Month Hearing Period.

During the next six months, hearings would be held on all petitions for boundary changes in the county.

A Three-Month Decision Period.

In the final three-month period of the cycle, action would be taken on all petitions for the county. Priority would be given to combinations of petitions that are judged most consistent with state and county plans and policies.

The lengths of time attached to each stage are illustrative only. They indicate that at times the LUC staff would be involved in some stage of the cycle for more than one county. However, the Commission itself would be involved in nine months of effort per year--for hearings and decisions.

Organizational Responsibilities

Under this alternative, petitioners would be responsible, as they are now, for providing all data needed to support their requests. They might also elect to provide information on a joint basis with other petitioners; that is, they might indicate how a grouping of petitions is compatible, since some of the ultimate evaluation of petitions by the LUC and its staff will be done on the basis of groupings of petitions.

County and state agencies with substantive interests in the petitions would review them and make recommendations.

The Land Use Commission staff would need to be augmented under this system; it would have its present functions and some additional ones. It would be responsible for notifying the public of the time periods when petitions will be received for each county. It would examine petitions as they are filed and request additional information if petitions do not meet requirements. It would have the responsibility for preparing an analysis of undeveloped urban lands and inappropriately classified lands in each county as well as a summary of needs and constraints related to land use in the county. It would construct scenarios including those involving groupings of subsets of the petitions in order to assess the sensitivity of alternate arrangements in terms of their multiple impacts; it would conduct an assessment of these multiple impacts.

The Commission would consider each petition in terms of both its individual impact and in terms of the cumulative impact of it and other proposed land use changes. It would assign priority to those petitions most consistent with state and county plans and the LUC's own guidelines and approve or deny each petition by including it in or excluding it from a package of applications whose cumulative effects are considered to be most consistent with LUC guidelines.

Analytic Requirements

This system would require a review every four years of actual land utilization, by county, in staggered terms; this would be conducted by the LUC staff. Of special interest would be information on undeveloped land in the urban district, including how long it has been classified urban, why it has not been developed, any plans for its development, and general characteristics of the land. The result would be a vacant urban land inventory, complete with estimates for the number of dwelling units that might reasonably be accommodated on the land, taking into consideration the difficulty or unreasonableness of developing some land units.

The vacant urban land inventory would provide the basic information on available supply which would be combined with estimates on land requirements during the ensuing four-year period, based on population and economic projections. A comparison of these two figures would provide an estimate of the minimal amount of land requiring reclassification to the urban district during the review cycle.

As each petition is received, county and state agencies would be required to review it, both singly and, when scenarios are formulated which combine petitions, collectively. These analyses are similar to those which are now conducted by these agencies, although the analyses of cumulative impacts anticipated from combinations of petitions would be broader in scope than those done now. Of special interest would be the analysis which would examine how sensitive the cumulative impacts would be to various combinations of petitions. This might permit the isolation of those proposals which are most consistent with county and state objectives from those which are not.

Petitioners would be required to provide the same information regarding their proposals as they now are.

Major Assumptions

The most significant assumption is that state and county goals, objectives, policies, and guidelines will be clear enough to guide the LUC in its decision-making. That is, if this set of procedures does not result in a bifurcation of petitions into two distinct classes--those preferred and those not preferred--based on established policy, all is for naught.

The system assumes that the LUC staff will have adequate resources to be able to conduct sets of comparative analyses of cumulative impact, based on the alternative scenarios discussed above. This would require a larger staff than the LUC now enjoys.

The system assumes that commissioners will be able to devote large blocks of time to hearings. Ways to balance the workload may need to be considered, since significant variation in the number of petitions among the various counties might result. At present, the Commission hears about twenty petitions for boundary changes per year, meeting an average of one-and-one-half days per month. The complexity of the proposals varies, so that one or two large proposals might take as much time as seven or eight smaller ones. A consideration of multiple proposals would entail complex hearings. In 1976, action was completed on two petitions on Oahu, three on Hawaii, four on Maui, and five on Kauai. In 1977, the figures were four on Oahu, two on Hawaii, four on Maui, and five on Kauai. (The number of petitions filed was greater, but some were withdrawn.) If petitions could be filed only once every four years, as proposed, these numbers might be expected to quadruple, making the average number to be considered approximately a dozen per year, but varying greatly depending on the county.

Examples Where the Method Has Been Used

There is no other example of the application of this set of procedures. The five-year boundary review originally provided for in the Land Use Law was similar in some respects. However, there was no restriction on reclassification petitions during the interim between reviews, as there is in the method described here. Thus, the benefits of consolidated review were undermined.

Legislative Requirements

The proposal assumes that the LUC remains a quasi-judicial body. However, some significant changes in its procedures would be required. First, the LUC and its staff would have to adopt a new stance. At present, the LUC in essence judges individual petitions on their own merits. Under this proposal, the LUC would become more of a planning and consciously guiding body; while each petition would ultimately be either approved or denied, the LUC would consciously weigh the applications against one another. This would change the fundamental nature of the LUC.

The Land Use Law and regulations would have to be amended to provide for:

- The consolidated filing, review, hearing, and action on all petitions from each county. The amendments should state the objectives of such review.
- Changes in the length of time during which certain actions were required (e.g., hearings) would be required.
- Notification requirements would require changing so that it would be clear at what times petitions were accepted and heard.
- Changes in policies and development of guidelines reflecting the purposes of consolidated review would be required.
- Changes in the responsibilities of the staff should be specified.

Assessment in Terms of Major Growth Management Issues

Consolidated review procedures make it possible for a comprehensive assessment of the impacts of major land use changes on any one island. The juxtaposition of petitions allows for a thorough analysis of alternative strategies of new growth. Whether the analysis would be comprehensive with regard to the range of impacts that would be considered would depend, of course, on other legal requirements and who was charged with the analysis.

Under the periodic boundary review procedures as outlined above there is nothing proposed that would specifically bind the Commission in its decisions. However, when this proposal is viewed within the context of the State Plan structure that was enacted by the 1978 State Legislature (Act 100), it is possible that the county plans and state functional plans would serve to reduce the degree of discretion traditionally exercised by the Commission.

The simultaneous review of several major boundary amendments also makes it possible for the Commission to play a more active role in guiding growth. The Commission would, in effect, weigh several growth alternatives and choose that alternative or combination of alternatives most consistent with the goals, objectives, policies, and priority directions of the State Plan, the county plans, and the state functional plans.

A COMPARISON OF THE ALTERNATIVES

This section will provide an interpretation of the practical effect of the alternatives discussed above. This is intended to clarify the distinctions among the alternatives and will illustrate their relative advantages and disadvantages.

In order to put this comparison into perspective, it is useful to consider a specific decision-making context. There is probably no better example of an area under pressure for land use change than the sub-region of Oahu termed "Central Oahu." Central Oahu is generally defined as the stretch of developable land lying between the Waianae and Koolau mountain ranges and extending from the North Shore to Pearl Harbor and Ewa. The land in this area is characterized by its high agricultural productivity and its efficient conversion to development in urban use. The pressures for development in this region were examined by the Department of Planning and Economic Development in its Central Oahu Planning Study in 1971 and 1972. The pressure for development has resulted in a number of significant decisions by the Land Use Commission to remove land from the agricultural district and place it in the urban district. Notable among recent decisions have been the boundary amendments providing for extension of Mililani Town, development of the Gentry-Waipio residential, commercial, and industrial subdivision, and the resort/residential development at West Beach. Added pressure is provided by the anticipated reapplication for conversion to urban use of Waiawa Ridge (Bishop Estate), long-range plans for further expansion of Mililani Town (Castle & Cooke), and both public and private proposals for large-scale urban development in the Ewa coastal plain (Campbell Estate). The foregoing are indicative, but not exhaustive, of proposals for urban growth in the area.

It is useful to briefly consider what import each of the alternatives in this study might have on LUC decisions. In order to focus the discussion, it will be limited to a consideration of a specific set of concerns which are especially relevant to the Central Oahu context. These are:

- (1) impact on agricultural operations;
- (2) fiscal impacts;
- (3) water supply; and
- (4) housing.

The discussion which follows will suggest how each of the alternative proposals for modifying LUC procedures would address these issues.

Impact on Agricultural Operations

This is an especially sensitive issue in Central Oahu because much of the agricultural land in that region is classified "prime." Yet, that land is simultaneously capable of efficient urban development.

Guidelines Revision

This approach requires judgment by the LUC of whether the withdrawal of valued agricultural lands will have an adverse impact on the viability of agricultural operations. Even if it is judged to have such an impact, this option permits that consequence to be traded-off against other valued outcomes.

A Performance Standards System

A variety of approaches might be developed, ranging from outright prohibition of withdrawal of valued agricultural lands to permission of withdrawal, subject to economic sanctions or guarantees that performance of the agricultural unit will not deteriorate.

A Regional Environmental Assessment System

This approach requires detailed information about the potential impacts of withdrawal of agricultural lands on the viability of agricultural operations in the region. However, the provision of this information does not bind the LUC's decision.

A Regional Sketch Plan

This alternative provides for the graphic representation of preferred locations for urban growth relative to lands of high agricultural productivity, such as those areas in the Ewa coastal plain with poorer soil characteristics.

A System for Consolidated Review of Boundary Amendment Petitions

This approach would allow for simultaneous review of several petitions in order to assess their individual and cumulative impact on agricultural operations. The analysis would be similar to that accomplished by the Department of Agriculture as part of its testimony on the West Beach petition; that testimony highlighted the potential cumulative impacts of the gradual withdrawal of individual land units in Central Oahu from agricultural use. This alternative would also allow an ordering of the petitions in terms of preference.

Fiscal Impacts

The fiscal impacts of potential urban development of the Central Oahu region was the subject of much analysis in the Central Oahu Planning Study referred to above. Of special concern is the cost of providing transportation improvements--not only in the vicinity of the proposed developments, but "downstream."

Guidelines Revision

This approach requires judgment by the LUC on the likely impact of proposed boundary amendments on fiscal resources. Under existing procedures, each proposal is considered independently, unless petitions pertaining to the same region have been submitted at approximately the same time; this inhibits the considerations of cumulative impacts. Negative impacts may be traded-off against other valued outcomes.

A Performance Standards System

Performance standards can be constructed so as to require a greater shifting of financial responsibility for public services and facilities to the developer in those areas where they are not readily available. Such might be the case, for example, in assessing charges for a new interchange with the H-2 freeway for the Gentry-Waipio development if that development should necessitate such an improvement. Such provisions serve to discourage scattered, inefficient development.

A Regional Environmental Assessment System

This approach requires the generation of detailed information about the fiscal impact of both on-site and region-wide public service needs resulting from the proposed boundary amendment. For example, the cost of expanding the capacity of the Red Hill transportation corridor would be assessed--at least in part--to large-scale developments in Central Oahu.

A Regional Sketch Plan

This approach makes it possible to coordinate decisions about the location of new development with state functional plans for public facilities and services by making such linkages more visible to the LUC.

A System for Consolidated Review of Boundary Amendment Petitions

This proposal promotes the coordinated programming of public facilities and the estimation of the aggregate demand of public services on a regional basis.

Water Supply

The concern over the groundwater aquifer in the southern portion of Central Oahu (the Pearl Harbor aquifer) has intensified in recent years with the deterioration in supply and quality, particularly evident in the lower elevations. The recognition of this concern as an element that links developments in a region will no doubt become more pronounced.

Guidelines Revision

This approach draws attention to water availability and quality as issues of importance, but because of the imprecision of guidelines (e.g., "prevent the significant deterioration of groundwater sources") and because of the opportunity to trade-off this value with others, does not guarantee non-degradation.

A Performance Standards System

It is possible to construct performance standards incorporating thresholds for the withdrawal of groundwater and/or requiring the applicant to assume the cost of overcoming such thresholds, such as by bearing a pro-rata share of costs incurred in importing water from other service areas.

A Regional Environmental Assessment System

This approach would foster the consideration of the impact of development at a particular site on entire water-recharge areas and groundwater storage areas.

A Regional Sketch Plan

Development of a regional sketch plan would promote the coordination of new development with existing facilities and assure that available resources are not exceeded by aggregate demand.

A System for Consolidated Review of Boundary Amendment Petitions

Consolidated review would make possible the coordination of aggregate demand for water with available water supplies to promote efficiency in provision of services. For example, if it became necessary to begin importing water from another area, necessitating construction of transmission lines, it might prove to be efficient to approve petitions in the water-short region, if they were of such a magnitude that average costs were reduced through economies of scale and if they were located in close proximity to one another.

Housing

The provision of housing "demanded" by the public has been the principal argument used in the promotion of urban development in Central Oahu. In terms of providing a good housing product to the public at reasonable cost, only the performance standards and consolidated review systems would be particularly effective.

Guidelines Revision

Given guidelines promoting housing for moderate-income families, there are strong arguments for urbanizing Central Oahu. While a land use regulatory system based on guidelines may embody such values, it does not specify how to make trade-offs between them and other values, such as the preservation of agricultural land.

A Performance Standards System

Performance standards could be constructed which would require developers to meet specific quotas of different classes of housing or to provide land or other assistance to public authorities for public housing programs.

A Regional Environmental Assessment System

Such a system would not add appreciably to what can be accomplished by existing LUC procedures, which consider the type of housing proposed and how it relates to the general market.

A Regional Sketch Plan

A regional sketch plan could be used to identify areas most suitable for residential development based on physiography, environmental features, and other factors expressed in public policy. This approach would not be particularly useful in dealing with specific housing quality or cost considerations.

A System for Consolidated Review of Boundary Amendment Petitions

Consolidated review of petitions would permit the LUC to rank alternative proposals in terms of how well they address housing needs of the community. This might result in a higher level of competition among petitioners to provide types of housing to which they believe the LUC is particularly sensitive.

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41. HRS 226-52(b).
42. HRS 226-52(b)(2)(E).
43. HRS 226-52(b)(3).
44. HRS 226-52(b)(1).
45. HRS 226-53(a).
46. HRS 226-54(1).
47. HRS 226-54(2).
48. HRS 226-54(3).
49. HRS 226-54(4).

50. HRS 226-54(8).
51. HRS 226-63(a)(2).
52. HRS 226-58(d).
53. HRS 226-59(a).
54. HRS 226-59(b).
55. HRS 226-3.
56. HRS 226-4 and -5.
57. HRS 226-5 and -28.
58. HRS 226-13(a).
59. HRS 226-13(b)(1) and (2).
60. HRS 226-2(7).
61. HRS 226-104(b)(2).
62. HRS 226-104(c)(2).
63. HRS 226-104(c)(3).
64. HRS 226-104(c)(5).
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74. HRS 226-105(c).
75. HRS 226-103(c)(1).
76. HRS 226-103(d)(1).
77. HRS 226-104(c)(2).
78. HRS 226-104(b)(2).
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THE IMPACTS OF WATER REALLOCATION DECISIONS IN HAWAII

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INTRODUCTION

Water use in Hawaii has increasingly emerged as a recurring topic of public discussion. There was little reason for the public to be concerned about water use as long as there were new sources of groundwater to be developed at low costs. But these conditions are clearly coming to an end, for already some public agencies in Hawaii are deliberately withdrawing water from agricultural use in order to provide inexpensive water to urban residents. The alternative would be to develop more costly sources of groundwater, to exchange "treated" sewage water for potable water now in agricultural use, or to desalinate brackish water. Although these alternatives will probably be used someday, at present their use is being delayed by converting water from uses that have low values in the market, particularly for the irrigation of taro and sugar.

Public decisions to convert water from agricultural to urban use are relatively new occurrences in Hawaii. Consequently, agency personnel have not had an opportunity to develop some of the analytic approaches that potentially would assist in making significant water reallocation decisions. These decisions ideally would be based on a full knowledge of the probable impacts on: (1) the physical environment, (2) the localized economy, and (3) the daily lives of the people affected. Although a complete knowledge of these impacts would be impossibly expensive to develop, reasonable procedures can be pursued which should provide considerable amounts of useful information about their nature and magnitude.

As this study team has assessed the available procedures for this purpose, it has become clear that present agency personnel in Hawaii are relatively adept at assessing the hydrological and physical environmental impacts of changes in water use. However, they somewhat lack expertise in assessing impacts of a social or economic nature. Consequently, it was decided at an early stage in the preparation of this report to give emphasis to the use of the most promising techniques that will provide at least some estimates of the impact on jobs, incomes, production levels, land use, life-styles, etc. Just as important, emphasis has been given to the social need for such information, the hazards involved in using such estimates, and the reasons why present agencies are not well equipped to do such analysis.

Although water reallocation decisions can be and are made without performing the analysis discussed in this report, such efforts can offer a decision-maker a number of advantages. For example, an analyst may be able to point out unforeseen consequences of an act, or it may be possible to define the problem in a way that suggests the need for a broader overall decision.

In any case, a properly conducted analysis should evaluate the major alternatives in a convenient and comprehensible fashion. Ideally, the impacts of the alternative decisions are described in terms (or

numbers) that are readily comparable. In this sense, the analysis is similar to the feasibility studies performed by private businesses, except that a public agency must include in its considerations all significant impacts on society. In other words, instead of looking only at the more narrow considerations of efficiency, an agency should be asking whether society as a whole will be made better off by a particular undertaking or by alternatively undertaking some other use of the same resources.

The impacts of these decisions should be measured against the extent to which they detract from or contribute to the achievement of society's objectives. While benefits are defined relative to the achievement of fundamental objectives, negative impacts (costs) are defined as foregone benefits. Therefore, we should be assured that a decision by a public agency implies that no alternative use of the resources consumed would secure better results with respect to society's objectives.

Some impacts are registered in the marketplace by prices; some prices incorrectly reflect society's values; some impacts are not reflected in any market but they can be estimated through simulated market values; it is nearly impossible to think of adequate market valuation processes for other impacts. In the case of misleading prices, the numbers conceivably can be adjusted by examining the interaction between fundamental policy objectives and basic resource availabilities. If a particular resource is very scarce or if it has valuable alternative uses, then the value assigned can be appropriately high.

It is also important to examine who experiences the impacts involved. Not only does the support for and opposition against a project depend on who benefits and who pays, but some water projects are built as a means of giving greater advantages to certain portions of the population, such as farmers or those in poverty.

Socioeconomic impact analysis necessarily depends on an accurate knowledge of relations among physical resources, but it also must include considerations of legal constraints, administrative procedures, and budgetary "limits" which affect the nature and distribution of impacts. Even when these factors are built into the analysis, tremendous difficulties remain. For example, by virtue of training and due to existing clientele relationships, agency personnel may be prone to consider certain impacts to be not as important as they are perceived by some segments of society. Also, the basic problems of ignorance about the details of the present and future necessarily cause analysis to be inaccurate or frustratingly vague.

UNCERTAINTY AS A HAZARD OF ANALYSIS

"Water resources managers typically have only partial control over the object of their concern - the water which they must manage. Therefore, water administration encompasses conflict management, interagency coordination, and planning in a setting of uncertainty."^{1/}

The amount of water we have or can produce and the amount needed by society have become topics of increasing concern. Unfortunately, there is little reliable information available regarding present and projected amounts because of the difficult uncertainties involved in the geological, economic, social, and political aspects of the situation.

Supply Uncertainties

Uncertainties in the supply of water involve both our present sources in the form of rainfall and accumulated underground storage, and potential sources such as desalination and reuse. Each of these also involve uncertainties arising from imperfect knowledge concerning the economics, planning, and management of the water supply. At least two levels of uncertainty exist. First, the uncertainty in managing our existing supply - how much water is there? The second is the uncertainty in creating new supplies - what are the economic and environmental costs of increasing our supply?

Annual and seasonal variations in precipitation will affect the quantity of water available at any time. Extensive rainfall records have been maintained over the years, and while "wet" and "dry" cycles may occur, they cannot be predicted with any useful certainty. During a drought, more water will be pumped from groundwater sources than would even normally be replenished by rainfall or surface water. This need to rely on groundwater not only reduces the amount in accumulated storage, but there also may be long-term effects on the water supply, for studies indicate it may take decades for a drop of rain to fully percolate down to our typical groundwater aquifers. The effects of a drought on the water supply thus may not be apparent until some years in the future. "In Honolulu it is believed that following the lowering of basal water heads during dry periods or by heavy draft, the related shrinkage of the bottom part of a thick Ghyben-Herzberg lens may not be completed for many years or possibly several decades."^{2/} A more immediate effect of a drought is the increased consumption out of the groundwater supply to make up for less rainfall.

Surprisingly little is known about the supply of accumulated underground storage. From what is known to be the physical nature of any freshwater lens, inferences can be made about the behavior of a particular lens under various conditions. These inferences are subject to certain parameters such as: the size of the aquifer; the age of the

water; the degree of interrelatedness with surface, high level, and other groundwater; the rate of recharge; the stability of the balance between fresh water and salt water.

Potential sources of water supply include desalting and recycling, which are technologically possible, but not without economic, environmental, and legal costs. These costs will be borne by the public, whether the price be direct in a higher water bill or indirect in environmental degradation. The values, perceptions, and attitudes underlying the magnitude of these costs vary among people and change through time. The uncertainties so far mentioned specifically relate to the quantity of the water supply, but in many instances increasing quantity may decrease quality, often to an unpredictable extent. Decreasing stream flows resulting from stream diversions or groundwater development produces increased concentrations of dissolved solids which not only affects the desired taste and purity of water for certain uses, but they create oxygen deficient water and higher temperatures with resultant fish kills, odor problems, and the general inability of the stream to flush and dilute wastes. Overpumping of groundwater sources also may cause intrusion of salt water and degradation of the aquifer. Even techniques to increase the supply such as artificial recharge of groundwater aquifers or the use of treated sewage effluent for irrigation may affect the quality of the accumulated underground storage.

Demand Uncertainties

Population growth, the nature and spread of land development, changes in per capita use of water, the economic growth of water-using industries, the effectiveness of conservation education, emerging technology, and changing prices all determine future demand for water. The uncertainty of our knowledge of the future nature of these factors is reduced by relying on trend projections. The traditional approach to such trend projections is to determine how to meet "requirements" rather than how to control and direct the demand, even though these factors often are subject to governmental actions.

The Hawaii State Plan contains the most current, official statement of Hawaii's future population and economic structure. Civilian resident population on Oahu is projected to be 776,900 in 1990; military and dependents, 122,400; and visitors 65,900.^{3/} Even though these projections might be accepted, many uncertainties still remain in estimating per capita water demand. The county boards of water supply provide for commercial, public, some industrial, and some agricultural uses.

". . . Existing municipal water use data do not generally differentiate between types of uses. A rough guideline, however, is that water use in excess of about 80 gallons per capita per day (gcd) is attributable to nondomestic purposes . . ."^{4/}

As the population grows, water planners are becoming increasingly concerned about the rising rate of per capita water consumption. One study in Hawaii found that for the period 1960-1971:^{5/}

- (1) Per capita consumption is greater in single family dwellings than multiple family dwellings due to outdoor sprinkling but indoor domestic use is greater in multiple family dwellings.
- (2) The water consumption level in established residential areas is stable.
- (3) Overall increase in per capita consumption on Oahu was due mostly to expanding economic activity led by the construction industry.

One of the policy implications derived from the findings was that the "requirement" approach to forecasting future water needs could be improved upon by coordination with land use planning. The . . . "density of population and intensity of water use in certain tracts will largely depend on the type of land development."^{6/} While the State may have to accommodate growth in population, there are many techniques available to the land and water planner regarding the rate, timing, location, and type of development that would provide some control over the "demand" for water.

Planning studies have generally allowed for 500 gallons of water per hotel room per day. This includes not only in-room use, but laundry, restaurant, etc., water to support one hotel room. According to the technical studies prepared in developing the State Plan, "sufficient tourism growth" implies an additional 11,401 rooms or water use amounting to 18.5 million gallons per day (mgd) in 1990.^{7/} Because tourists do not directly pay a water bill there is no price incentive to conserve water, although hotels install water-saving devices and recycling systems for laundry and dishwashing.

The largest water user on Oahu and in the State is the sugar industry. Sugar provides about 9,600 jobs in the State; 1,670 on Oahu. In 1975, the number of direct-plus-indirect jobs generated by the sugar industry was 15,800 or 4.2 percent of civilian jobs in the State.^{8/} Irrigation of sugarcane on Oahu requires 239 mgd.^{9/} Without sugar there would be no overall water shortage, but there could well be other shortages - open space, green belts, water recharge areas, jobs, and income. With the end of the Sugar Act in 1974 and the increasing competition from a sugar substitute, high fructose corn syrup, uncertainty clearly exists within the sugar industry and is beyond the control of state decisions. If the sugar industry survives economically, there are then other related uncertainties for the State, such as the urbanization of cane land, transfer of water from irrigation to urban use, and the effect of drip irrigation on groundwater recharge.

Uncertainty in water demand arises not only from uncertainties regarding the demand patterns of present users but also from new ones.

The Technical Studies for the State Plan concludes: "There is also a good chance that one of the developing activities (e.g., aquaculture, manganese nodule mining, one or more diversified agriculture crops, commercial fishing) will grow rapidly, becoming a major industry by 1990."^{10/} Any of these could have high water demands. The probability of one of these activities becoming a major industry largely depends on the state policies and programs to support or not support its development. For example, to an extent the State supports aquaculture and diversified agriculture by making land and water somewhat available and affordable and by providing tax breaks and agricultural loans.

Water for environmental, ecological, aesthetic, and recreational purposes is another new and rising demand. Water planners traditionally have considered only the economic use of water which has generally been the meaning of terms such as "beneficial use" and "highest and best use." Although government policies state that environmental uses shall be given consideration in any water development project, they frequently have given way to economic "uses" of water. In contrast, Washington, Oregon, Montana, and Colorado have passed legislation recognizing nonconsumptive, instream use as beneficial.

Demand for a quantity of water implies a demand for certain standards of quality. Water supplied to our homes is high quality drinking water, but the portion actually consumed for drinking and cooking is very small, for the washing machine, the lawn, the toilet, and the garbage disposal all unnecessarily receive the same high quality water. What if we bought bottled water in the store for drinking and cooking and used lower quality water for all other nonconsumptive uses? The quality of water required for crop irrigation varies, although drip irrigation requires certain high quality characteristics to prevent clogging of the system. Water for industrial processing and water for air conditioning may also be of lower quality. The timing and degree of adoption of some of these practices to use lower quality water is often speculative at best, thus adding to our uncertainty.

Public education, appropriate pricing, and conservation technology are some of the ways water planners and managers can begin to exercise some degree of control over demand instead of simply meeting the demand. Technology has already provided us with many ways to conserve water in the home, in agriculture, and in industry. These include domestic water-saving devices for the shower and toilet, closed systems allowing in-house reuse of water, waterless toilets. In agriculture, water-saving techniques include drip irrigation and irrigation with recycled water. Industrial methods include cooling towers, and recycling and reuse systems. Water conservation, however, is voluntary with the exception of industrial water reuse which is virtually required by the enforcement of water quality standards.

Conflicts and lawsuits over the use of water are another source of uncertainty. The issue may have been clear decades ago when the Board of Water Supply was established in part to cap some wells and prevent waste of water. Today it is not clear what constitutes a beneficial

use, nor are use priorities clear. If the criteria for highest and best use is economic, why is not the market mechanism utilized to allocate water? The failure to provide a solution to allocation of water is due largely to our attitude towards water as a free and unique good.

We are so accustomed to thinking of rain as a free good that we confuse rain with water . . . water supplied to a particular person in a particular place is just as much a commodity as oil. There seems no reason to suppose why, in the first place, it should not be supplied in the cheapest possible way, and in the second place, once it has been supplied it should not pay its full cost. Furthermore, the situation is often confused because of the failure to realize that water is not one but many commodities. Water supplied to the urban bathtub is not the same commodity as water supplied to the field, the factory, or the recreational area.^{11/}

There is considerable uncertainty in estimates of supply and demand. This results in some difficulty in decision-making. The wide gap between knowledge and ignorance may in many cases force us to make "choices," not "decisions." Such choices will be made by public agencies in accord with their legal mandates, their perception of the "problem," and the resources at their command. This additional set of constraints can be discussed in terms of the overall "expected behavior" or institutional setting for such decisions.

THE INSTITUTIONAL SETTING

The two major public agencies involved in water management decisions on Oahu are the Department of Land and Natural Resources (DLNR) and the Honolulu Board of Water Supply (BWS). DLNR has the broad duties of collecting and correlating all information for the State concerning water resources and keeping it available for public inspection.^{12/} It has the responsibility to "initiate and conduct surveys of the water resources and requirements in the State as may be required to enable the formulation and revision from time to time as necessary of a master plan for the development, conservation, and most beneficial use of all water resources."^{13/} Also within DLNR's power is the designation of groundwater areas for regulation, protection, and control.^{14/} The anticipated enforcement of the Groundwater Use Act by DLNR will likely lead to numerous situations demanding appropriate analytic and decision-making capabilities, as further discussed beginning on page 80.

The Honolulu Board of Water Supply, as is true for each of the other counties, is basically responsible for the county's supply of domestic water, but it also supplies water for commercial, industrial,

and some agricultural uses. BWS has control of only about one-third of the water used on Oahu. The other two-thirds is controlled by sugar plantations, the military, and various private users. Understandably, the Board's perspective on the problem is conditioned by the developing needs of their clientele.

The functions and basic structural components of the Division of Water and Land Development (DOWALD) under DLNR have remained essentially the same since 1962 -- implying current stability in water management, but also raising questions of future effectiveness and ability to cope with possible impending water shortages. For example, if planning is done by the same agency that enforces or regulates policy, a professional or agency bias may exist, particularly since both DOWALD and BWS are heavily staffed with engineers.

The positions of DLNR and BWS on the water situation are somewhat different. DLNR does not seem to see any important immediate conflicts, allocational problems, or tradeoffs; there will be water for all uses if careful management procedures are followed. They would like to "move along" with the pilot desalination plant "but it's not a pressing issue."^{15/}

BWS perceives more immediate use conflicts and tradeoffs. Current policy requires sugar companies to curtail their overall water use if land formerly in sugar cultivation is urbanized. The Oahu Water Plan prepared for BWS favors water exchanges and the reuse of treated sewage effluent, but not desalinization.

The differences in these positions may be due to the stronger pressure felt by BWS to "deliver the goods." Since BWS is basically mandated to supply domestic water, when they fail, they are confronted with immediate customer feedback. In contrast, DLNR has much broader, less direct responsibilities for data collection, planning and management, a "master plan," etc.

Underlying Problems

The types of decisions made by any planner or manager are determined by technical, social, and philosophic factors. Some of the technical matters are the problems of developing needed levels of data in terms of water quality and quantity, the effectiveness of methodology, problems of forecasting needs, estimating system costs, and the calculation of economic benefits. Influences on decisions derive from conflicts between political interests, changes in social priorities, multiple and conflicting objectives, prior decisions, biases of professional values, and problems of coordination among agencies.

Both the State Administration and the Honolulu City Government are experiencing enough uncertainty directly related to these factors that their abilities to make decisions are being affected. For example, in September, 1977, Governor Ariyoshi appointed a commission to assess water supplies and needs throughout the Islands, especially on Oahu. In

his announcement, Governor Ariyoshi said that his administration's growth policy "must be largely structured in accordance with water availability . . . Before the State can consider priorities and various alternatives, it will be necessary for us to have a clear picture of the availability and the status of development of all our water resources."^{16/}

In November, 1977, the City Council's task force on water convened for the first time and advised the Council to hire an independent consultant to provide better information on Oahu's water situation.^{17/} Concern has been expressed that the information received may be biased by political considerations, thus possibly causing the Council to make unfortunate planning decisions.

Day-to-day water management decisions are also affected by personal experiences, attitudes, values, and opinions. The personality and behavior of people are influenced by the person's culture, the overall working situation, and the role expected. For example, professional value biases may occur when an agency is staffed predominantly with certain kinds of professionals, producing a "tyranny of expertise" rationale in decision-making. Managers who experience equivalent training will tend to behave in accord with organizational precepts. Agency traditions undoubtedly exist and become especially obvious when there are conflicts over policies and decisions between agencies. Finally, individual ideological beliefs based on background, societal values, and upbringing could form a personal normative bias in determining policies in water management.^{18/}

The problems arising from agency traditions are illustrated by the Department of Health's recent efforts to prepare proposed water quality standards regarding minimum stream flow requirements. The proposed water quality standards have produced a variety of objections from various agency representatives, ranging from a "negative impact on state efforts to develop an aquaculture industry" to ". . . direct conflict with the functions and responsibilities of the Board of Land and Natural Resources and the Natural Area Reserve Systems Commission."^{19/}

Furthermore, a study of federal water management practices revealed other factors which may also occur among water planners at a state level. For example, nature and water were valued to water management planners mainly for their potential as economic resources as opposed to their ecological or aesthetic benefits. As a whole, they were largely unaware of current environmental problems, yet considered them manageable.^{20/} These planners viewed their task to be that of meeting future water demands by using present technology in the existing institutions for purposes of expansion. Many were found to take an "elitist" outlook whereby their opinions of public competence and the value of public assistance in planning were not very high. The younger planners showed more distrust of public motives and the political process than the older ones. In general, they did not seem to relate changes in social trends to efforts in water resource development. Also, the personal philosophies of the individual planners did not necessarily follow their agencies' priorities.

The Groundwater Use Act

In general, the Groundwater Use Act (Chapter 177, Hawaii Revised Statutes) gives the State Board of Land and Natural Resources the authority to regulate the use of groundwater in areas designated by the board as being endangered or likely to become endangered by excessive or improper use. The objective of the Act appears to be to achieve the "most beneficial use" of the groundwater resources of the state, although this concept is not clearly defined.

Under terms of the Act, the Board of Land and Natural Resources may establish "designated groundwater areas" subject to its regulation and control if a particular area's water supply is threatened by groundwater withdrawal exceeding recharge, declining water levels, excessive salt content, excessive preventable waste, or proposed water developments that may lead to such conditions.

Individual household users are generally exempted from regulations, and existing uses are preserved by the Act except in times of shortage or emergency, in which case all users in an affected area may be subject to mandatory controls by the Board. In "designated" areas, additional uses of water, other than individual household uses and "preserved" uses, are required to obtain a permit from the Board. The Board is authorized to establish classes of permits and to establish fees which can vary according to the class of permit, the capital investment involved, and the quantity or nature of use. Permit holders may be required to relinquish their permits if there are more beneficial uses of the available water supply, although reasonable compensation must then be paid to the permit holder.

If a "shortage" of water is judged to exist, e.g., the absence of a sufficient quantity and quality of groundwater in a designated area to supply lawful use of water, then the Board is empowered to regulate all users in the area. In such a case domestic, municipal, and military uses will be given priority over other uses, with remaining "preserved" uses being given priority over all other remaining permitted uses.

If an "emergency" condition exists, e.g., a shortage in any groundwater area which threatens the public health, safety, and welfare, then the Board may authorize the appropriation of any water sources needed to protect the public health, safety, and welfare. Property rights affected by this action would have to be duly compensated.

The proposed rules and regulations for the implementation of Chapter 177 generally paraphrase the Act without further clarifying existing ambiguities. Areas which might need clarification include the following:

1. Designation of groundwater areas.

The rules do not further define the technical conditions which must occur before an area would be declared a designated groundwater area.

2. Classes of permitted uses.

The rules do not classify permitted uses according to type or method of use nor provide a fee schedule based on volume or type of use as permitted by the Act.

3. Most beneficial use.

There is no indication in the rules, and the law provides little guidance, concerning how to determine what are the most beneficial uses of the water resource if the Board is forced to choose between two or more prospective permitted uses.

4. Extinguishment of preserved use.

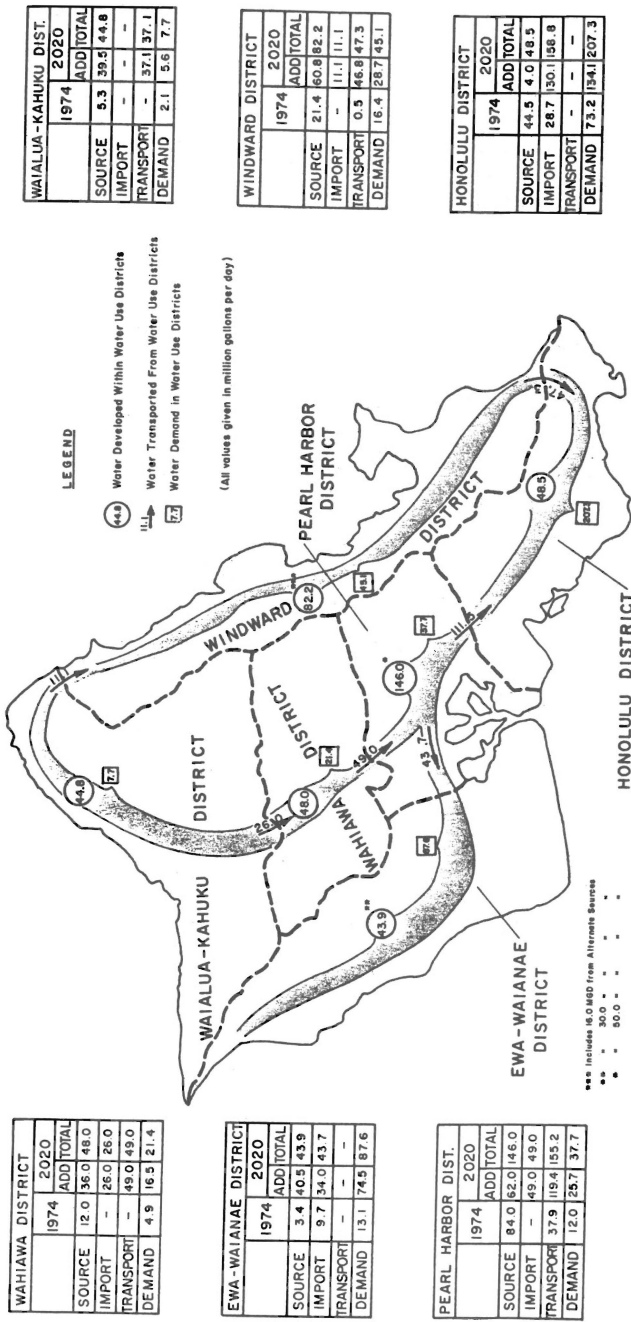
The rules do not define periods of "non-use" which might lead to the extinguishment of a preserved use. The level of reduced usage that might represent a period of non-use is not defined by the Act nor clarified by the rules.

Possible Implementation of the Act

As a major distribution center for Oahu's water supply and use, the Pearl Harbor Area is likely to be a central focal point for competing uses of readily available water on Oahu (see Figure 1). It is likely that BWS will attempt to trade available potable water for water from brackish sources in the Pearl Harbor Area and from treated sewage effluent in exchange for domestic quality water being used for sugar-cane. This is likely to occur even before some other available groundwater is developed, partly as a result of an apparent preference by BWS for water from the Pearl Harbor basal supply due to the uncertainties involved with tapping "diked" supplies and partly due to the high costs of transmission from other areas to the major population centers. During future dry years, even with the exchange of all potable water used by the sugar companies, restrictions are likely to be needed in order to supply domestic needs unless other alternate sources are developed or significant conservation measures are adopted.

Since additional urban development is planned for the Ewa plain, which will call for even greater demands for water from the basal supply, the Board of Land and Natural Resources is likely to someday classify the heavily tapped Pearl Harbor Aquifer as a "designated groundwater area" for the purpose of protecting the basal lens from salt water intrusion caused by heavy pumping during the dry summer months. This would probably result from indications that the use of groundwater in the area exceeds the rate of recharge and that some wells in the area have a marked increase in chloride content. DOWALD might then determine that during periods of drought, over-pumping may cause serious salt water intrusion causing long-term damage to the city's municipal water supply.

FIGURE 1--Disposition of Water Supply Developed and Distributed by the Board of Water Supply in the Year 2020



Source: Board of Water Supply, Oahu Water Plan, 1975.

HONOLULU DISTRICT	OAHU SUMMARY (All values in m.g.d.)			
	1974		2020	
SOURCE	44.5	28.7	73.2	46.5
IMPORT	-	-	158.8	-
TRANSPORT	-	-	-	207.3
DEMAND	4.9	28.7	48.5	158.8
SUBURBAN DISTRICT	126.1	-	28.7	48.5
TOTAL - OAHU	170.6	-	121.7	413.4
				406.8

In accordance with the provisions of the Groundwater Use Act and the regulations established in accordance with the Act, all existing users would submit a declaration to the Board of Land and Natural Resources; after determining the facts, the Board would issue certificates preserving the existing uses.^{21/} The certificate would describe the nature of the use preserved and set forth the maximum daily pumpage and annual days allowable from each well.

Under the "preserved use" provisions of the law, BWS and other suppliers of domestic water might be permitted to expand their pumpage in the area up to five percent, for example, more than their average per-day use during the year immediately prior to the date of the establishment of the designated area. Additional water use by the BWS or others might be allowed by permit only (individual household users are exempted from this provision), providing that (1) there is water available, (2) the use is beneficial, and (3) it will not impair previously granted "preserved" or "permitted" uses.

Uses granted by "preservation" or permit could not be changed (e.g., from agricultural to urban use) or sold, except with the approval of the Board. In effect this means that any additional urban use of water (except the permitted five percent increase) would then be substantially under the control of the Board of Land and Natural Resources. BWS would not be permitted to develop or condemn additional sources of water within the designated area or purchase water from other users without the state's permission. If the State refused to grant such permission, the only way of supplying additional customers would be through importation from outside the designated area, conservation measures imposed on existing uses, or by using alternative sources of water (e.g., desalinization). In the extreme case then, the Board of Land and Natural Resources could exert indirect control over additional urban uses of the land in "designated" groundwater areas by means of its control over changes in groundwater use.

It is more likely, however, that although the Board might be reluctant to permit additional development or pumping by the BWS, it would consider permitting the BWS to purchase or condemn water from existing preserved or permitted users, thus creating additional tradeoff situations between urban and agricultural use of water.

Instead of pursuing the route of declaring a "designated" area, the Board might take action under conditions of a "short-term water shortage." A scenario leading to such action might involve a two-year drought which would cause a temporary shortage of water in the designated groundwater area. Head levels would have dropped and it would be feared that salt intrusion might threaten municipal wells in the Pearl Harbor Area. Under these conditions, municipal, military, and individual household groundwater users might be required to reduce their daily pumpage by a certain amount, say 10 percent below their average pumpage during the past five years on a seasonally adjusted basis. Agricultural users might be asked to make reductions of perhaps 20 percent for the duration of the shortage conditions. Permitted users

(except permits for municipal water) could be required to reduce pumpage by something like 30 percent.

Under such conditions, there would likely be general compliance with the mandatory restrictions and some crop loss due to the drought conditions and restricted pumpage conditions. When the rains returned and head levels began to rise, the restrictions would be then lifted.

A more severe scenario suggests conditions of a long-term water shortage resulting from population growth and urban development which would result in increased municipal demand for water that, combined with agricultural demand, would exceed the supply of readily developed water. The Board of Water Supply may have by then already arranged to exchange much of the sugar companies' domestic quality water for water of lesser quality (treated effluent, brackish water, etc.), but this source of additional supply, too, would be essentially exhausted. The Board of Land and Natural Resources might then declare a water shortage of a more permanent nature. Heavy restrictions might then be placed on agricultural and industrial users so that heavy pumping would not threaten domestic quality water.

In such a scenario, as a result of the apparent permanent restrictions placed on pumping and the likely preference given to municipal use, court actions likely would be initiated by agricultural land users on the basis of the taking of private property without just compensation. The exact nature and extent of the shortage also might be challenged by the sugar companies. The state's ability to "manage" a scarce resource might thus be severely tested and conceivably found wanting in a number of areas, perhaps because the restrictions would have been placed on supply only with no actions taken to influence demand.

In summary, the overall impacts of water resource development and allocation not only will be important public issues as agencies in Hawaii make such decisions, but the agencies as presently mandated and designed are not equipped to identify such impacts nor to readily incorporate such considerations into their decision-making processes.

A PARTIAL FRAMEWORK FOR WATER RESOURCE DECISION-MAKING

The economic impacts of water resource decisions, as with other resource allocation decisions, are not limited to the immediate, direct dollar costs or returns. The impacts are often widespread throughout society, affecting other industries, consumers, and the physical and social environment in which we live. These impacts can be positive in nature, such as increased employment and a higher standard of living, or they can be negative, e.g., increasing traffic congestion, pollution, and the dissipation of a cultural heritage.

The impacts of water allocation have hydrological, technological, and economic aspects. Since an economic problem deals with the allocation of scarce resources to alternative uses, decisions have to be made concerning which ends are to be satisfied. This requires that value judgments must be made concerning the relative desirability of the alternative accomplishments. This may be distinguished from the technological and physical sciences where there may be only one end, therefore providing for an easier choice of alternatives.

The allocation of water for the enhancement of either the agricultural or urban sector of the society is a classic economic problem of resource allocation. According to the principles and standards for planning water and related land resources prepared by the U.S. Water Resources Council, "The overall purpose of water and land resource planning is to reflect society's preferences for attainment of the objectives . . . national economic development . . . quality of the environment . . . regional development . . ."^{22/} The value judgments which must be made can be classified into three main categories: (1) environmental, (2) social effects, and (3) income redistribution or equity.

Value Issues

Public opinion polls show that people are becoming increasingly concerned about the deterioration of the environment. This reflects a perceived need for overall environmental concern to: (1) ensure that demands placed upon nature do not exceed its capabilities; (2) keep in proper perspective nature's relationship to economic concerns, i.e., the battle between development and preservation, and (3) develop a need for better environmental studies. Blind progress and rapidly changing conditions, such as population growth, are considered likely to have long-range damaging effects on the physical environment.

Water resource development projects could have serious adverse effects on the environment with respect to ecological systems, aesthetic and scenic aspects, features of scientific value, and air, land, water, and noise pollution. Any plan or project which will permanently place a negative effect on any of the above for the purpose of a short-term gain or whose environmental impact is substantively unknown should, according to most authorities, be very critically considered.

In a growing economy such as ours, the resources of a fixed supply generally appreciate in value over time, whereas resources for which there exist substitutes will depreciate over time relative to those that are unique and fixed in supply. Consequently, preserved resources tend to gain in value when compared to the benefits derived from development projects. Also, as income increases, the public is known to desire to consume more of certain goods and services, particularly those that are dependent on environmental quality. Therefore, it is understandable that national preferences are shifting toward becoming more protective of the national ecosystem.

Our social organizations stem from basic political decisions which have arisen from basic conflicts in our society. If changing economic conditions give to some conceivable forms of organization, our society may well experience a serious deterioration in the basic values which permit a society to function effectively. Increased economic growth may solve only some problems and create others.

Increasing urbanization of Hawaii, accompanied by water development or reallocation, creates more regulation of life and decreased flexibility in social behavior. For example, we may increasingly lose the ability to go about the day without tension and assorted hassles, and our environment becomes less adaptable to any changes in plans and tastes.

Another value issue is based on ideas of ideal equity and income redistribution. Over the past 25 years the United States has increasingly embraced social welfare programs and normative social policies. The government has committed itself to providing services for the disadvantaged and to remedying social and economic inequalities through programs, such as social security, unemployment insurance, medical care, housing and educational subsidies, welfare payments, legal aid, etc. Such programs are not necessarily impossible to afford, for according to E. J. Mishan, "The merest fraction of America's annual expenditure on neogarbage - on expendables, inimitables, and on inane trivia - would suffice to remove all the remnants of hard-core poverty in the land."^{23/} Others claim that it is possible to alleviate poverty by switching from wholesale and indiscriminant welfarism to selective and discriminating welfare measures that benefit both taxpayers and the really poor.

Since agricultural use of water is the predominant use in Hawaii, particular attention must be given to the underlying values of such use. Irrigation usage values are based on preserving physical environmental conditions, the kinds of crops cultivated, and the rural life-styles associated with some types of agriculture. Also, the importance of self-sufficiency and the "import substitution" and "export promotion" arguments which would generate jobs and income are often cited.

As more land is converted to urban usage, one result is the loss of rural life-style. Cultural diversity is reduced, the agrarian creed which emphasizes the work ethic diminishes, as perhaps do the values of democracy, small enterprise, and the emphasis on personal and family integrity.

Methods have been devised to estimate the value that the public actually places on these factors. For example, behavioral studies can be performed to determine responses from community members to actual or proposed environmental changes. Experimental studies are possible, which collect responses from community members who participate in controlled games simulating changes. Furthermore, social surveys may be used in which interviews and opinions are sought in response to circumstances in hypothetical states. The details of these techniques necessarily are not further explored in the balance of this report due to the limitations of the overall study efforts.

Environmental Impact Statements

The existing legal mechanisms of environmental impact statements (EIS) call for much of this information. This requirement has evolved from initially being a tool of people concerned with the integrity of the physical environment. It subsequently has been broadened to provide a mechanism for the expression of a wide-ranging host of social, economic, and moral concerns. Although not a decision technique itself, it presently serves to require more detailed analysis to buttress, if not necessarily guide, many public decisions. Some of these decisions involve water reallocation, as discussed in the following pages.

Chapter 343 of the Hawaii Revised Statutes mandates the implementation of EIS procedures for any action which requires the use of State or County lands, requires the use of State or County funds, occurs on Conservation lands, occurs within shoreline setback areas, involves historical sites, is in the Waikiki-Diamond Head area, or would involve an amendment to a county general plan. Of the list of items for inclusion in a complete EIS, the emphasis of the analysis in an EIS directs itself to the impact(s) of a proposed action on the "environment," which is further clarified in the Environmental Quality Commission's rules and regulations as "natural and cultural resources," as well as the "economic [and] social welfare of the community or state."^{24/} (Appendix IV reflects the general EIS process on all actions proposed in consideration for the preparation of EIS.) Parties indicating an interest in the preparation of the EIS must be consulted by the proposer of the action.

Regulations as specified by the Environmental Quality Commission state that the EIS must contain the following:^{25/}

- (1) A summary.
- (2) A project description which includes a map, statement of objectives, use of public lands or funds, historic perspective and technical data.
- (3) A description of environment in which the project is to take place.
- (4) Relationship of the proposed action to land use plans.
- (5) Probable impacts on the environment.
- (6) Unavoidable adverse environmental effects.
- (7) Alternatives that satisfy the same objectives.
- (8) The relationship between short-term and long-term aspects of impacts.
- (9) Proposed impact mitigation measures.

- (10) Identification of unavoidable and irreversible impacts on resources.
- (11) Offsetting benefits as indicated by governmental policies.
- (12) Disclosure of all organizations and individuals consulted.
- (13) Consultation comments and responses.
- (14) Issues left unresolved.
- (15) Necessary project approvals.

Before an action can be undertaken, the EIS must be accepted by offices designated by the Governor in the case of an action using state lands or funds, or by offices designated by the Mayor in the case of an action using county lands or funds but not state land or funds. The EIS must be accepted by the approving agency in the case of a private action before the approval can be given. In the assessment process by the Environmental Quality Commission (EQC), an action may be considered exempt from preparing an EIS if it is expected to have minimal or no significant effect on the environment or if it falls within the following exempt classes of action:26/

- (1) Operations, repairs or maintenance of existing structures, facilities, equipment or topographical features, involving negligible or no expansion or change of use beyond that previously existing;
- (2) Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose . . . ;
- (3) Construction and location of single, new, small facilities or structures and the alteration and modification of the same . . . , [as] single family residences, [etc.] . . . ;
- (4) Minor alterations in the conditions of land, water, or vegetation;
- (5) Basic data collection, research, experimental management, and resources evaluation activities . . . ;
- (6) Continuing administrative activities . . . ;

- (7) Construction or placement of minor structures accessory to existing facilities;
- (8) Interior alterations . . . ;
- (9) Demolition of structures, except those . . . designated [as historic] . . . ;
- (10) Zoning variances [with some exceptions]

Regulation 1:31 of the EQC states that in determining whether an action may have a significant effect on the environment, the agency shall consider every phase of a proposed action, expected consequences, either primary or secondary, and the cumulative as well as the short- or long-term effect of the action. A significant effect on the environment occurs when the action:27/

- (1) involves an irrevocable commitment to loss or destruction of any natural or cultural resource;
- (2) curtails the range of beneficial use of the environment;
- (3) conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapters 342 and 344 [HRS] . . . ;
- (4) substantially affects the economic or social welfare of the community or State;
- (5) substantially affects economic or sociological activities;
- (6) involves substantial secondary impacts, such as population changes or effects on public facilities;
- (7) involves a substantial degradation of environmental quality;
- (8) is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;
- (9) substantially affects a rare, threatened, or endangered species of animal or plant, or habitat;
- (10) detrimentally affects air or water quality or ambient noise levels; or

- (11) affects an environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

Agencies submit and file a notice of determination with the EQC after assessing whether the action has or has no significant effect. The notice is considered as an EIS "Preparation Notice" if the determination requires an EIS. If the agency determines that an EIS is not required, the notice is considered to be a "Negative Declaration."

After complying with the time elements and consultation requirements and review process, the EIS is then accepted. Acceptance means a formal determination that the document required to be filed pursuant to Section 343-4, HRS, fulfills the definition of an environmental impact statement, adequately describes identifiable environmental impacts, and satisfactorily responds to comments received during the review of the statement.^{28/}

Impact Analysis

The preceding discussion of EIS requirements does not provide us with the analytic tools necessary to identify social and economic impacts. The first step in any such analytic procedure would be to define the impacted society, be it at a world, national, state, local, or community level. Interest in impact analysis among U.S. economists has come into prominence in recent decades, partly because there has been a growth of large public investment projects which use considerable resources and have effects on prices and outputs of other products over a long period of time. Accompanying this analysis has been the responsive development of techniques, such as operation research and systems analysis. There are, however, two general limitations to the performance of impact analysis. This is used most successfully only when making decisions within a specified framework, although the project may involve a wide range of considerations, many of which are political and social in character. Also, the technique developed so far is difficult to apply to large investment decisions having major effects on outputs and prices over the entire local economy.

In general, as all the alternative projects are considered, impact analysis may enable seemingly "ridiculous" projects to look more attractive as all the various impacts are identified. On the other hand, decision-makers are thus forced to more rationally and concretely defend their decisions on projects, thus, eliminating whimsical and virtually unfeasible projects.

This, however, would also serve to lengthen the decision time and could thus eliminate certain options that may be the best solutions. As more information of the effects is generated, the chances of some unexpected consequence is lessened. Yet, the development of this information costs time, money, and possibly foregone options.

The objective then is to maximize the value of the time stream of all benefits less the value of the time stream of all costs subject to certain constraints. Therefore, the general principle of impact analysis can be set up through the identification of the following items:

1. The kinds of impacts that are to be considered.
2. The values to be assigned to each.
3. The interest rate at which the values will be discounted so that values through time can be compared.
4. The relevant constraints.

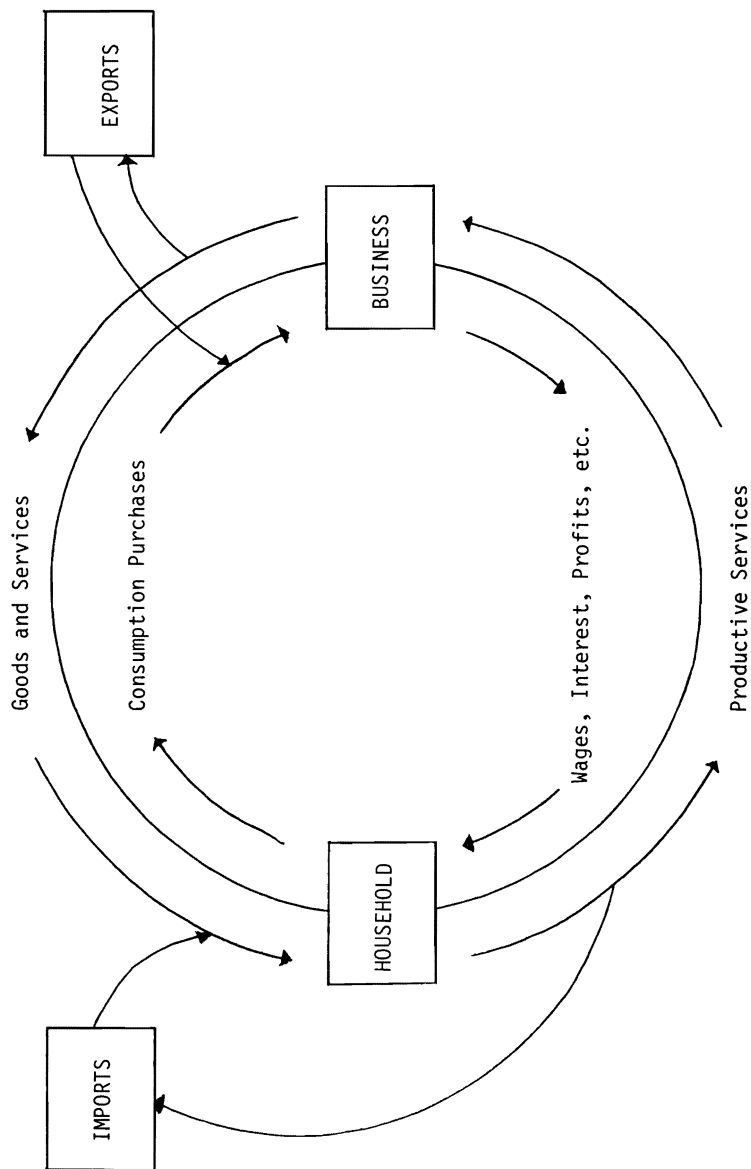
A definition of the impacts of a project is all the "goods and bads" that are generated. These can be broken down into the following categories: (1) impacts valued in the marketplace in a manner that correctly accounts for social values, such as most agricultural inputs and non-price-supported farm commodities; (2) impacts valued in the marketplace, but in a manner which fails to account for social values, such as labor that would otherwise be unemployed; (3) impacts that have no market price, but for which appropriate social values can be approximated, such as admission to a public park or zoo; (4) impacts which would be extremely difficult to determine, such as for the creation or maintenance of historic sites or beautiful views, or such as the maintenance of water quality at a higher level than would be required for health or commercial reasons.^{29/} A sound impact analysis compares not only the monetarily defined impacts, but it also evaluates in appropriate terms those that are nonquantifiable and noncommensurable.

Also, in order to properly assess the totality of consequences of a decision to be made, it is necessary to consider not only the direct effects that will most likely occur given some change, but also the subsequent repercussive effects must be examined. The "input-output" or "interindustry" technique addresses some of the quantifiable repercussive effects in a formalized mathematical model. (See Appendix I for a technical explanation.)

A better understanding of this principle can be gained by examining Figure 2. Suppose that consumers begin to demand less sugar. Besides the fall in sales for sugar, this change affects the outputs of other industries as input suppliers and output buyers adjust to these changes. The reduction in consumption will reduce the output of refineries, transportation operations, etc., with the possibility of reducing the amount of labor employed in the various industries. But, because most of the sugar is exported from Hawaii, the reduction of demand for sugar would mean a reduction in exports.

Each dollar of exports represents dollar inflows to our local economy, viz., money flows into our economic system from "outsiders." Imports to Hawaii reverse the flow, causing dollars to "leak" from the

FIGURE 2--Circular Flow of Incomes and Expenditures



Source: Paul A. Samuelson, *Economics: An Introductory Analysis* (McGraw-Hill: New York) 1967, p. 171. The diagram was modified to introduce the import and export sectors.

local economy. Another source of "leakage" is savings. For example, part of the profits made by local businesses in their sales to tourists are used for consumption expenditures and the rest is saved. The amount expended becomes income to someone else, and that person spends part of it and saves the rest, and so on.

Within the appropriate geographical constraints, the analysis should include benefits and costs without regard to whom they will accrue. For example, if a new irrigation project diverts water from users downstream, the losses they suffer become a part of the costs of the project in the same way as the cost of the irrigation works itself.

However convenient the usage of market prices may be in project analysis, there are circumstances when these market prices cannot be taken as measures of the value of project outputs or inputs. One such circumstance occurs when the project output or input is so large that the project itself causes prices to change. Another set of circumstances occurs with market imperfections or substantial underemployment of labor and production capacity.

"Sunk" costs are costs which have been incurred before the appraisal of the project and therefore can no longer be avoided. These should not be included as part of the cost of the project in the analysis. Only costs which are yet to be incurred should be considered.

Some effects impose no costs nor confer benefits within the confines of the project. Yet, they affect the achievement of the objectives and therefore should be included. Examples are pollution, congestion, and other side effects on health or fisheries which are generally difficult to quantify.

The project may bring about changes in prices for its inputs and outputs. It may also have wide-ranging effects on producers and consumers other than those directly involved in the project itself. Whether this is a serious qualification or adjustment to make depends on the extent to which the project results in price changes.

Some impacts often are "double-counted" when evaluating a project. For example, increases in agricultural output mistakenly may be counted twice as positive impacts if agricultural property value increases are counted in addition to the value of the increased production itself which gives rise to the enhanced property value.

Another problem often encountered is mistakenly counting negative impacts as benefits. For example, a project often requires labor which could be used in other endeavors. Only if such a resource would otherwise be unemployed would its use on the project not be counted as a negative impact.

The source of financing of government investments can also have significant repercussive effects throughout the economy. This is especially true of localized economies. These projects can be financed

by "pay-as-you-go" cash financing through taxation or through bond financing. This means, then, that funds which could have been used for consumption expenditures are reduced, not only by the initial amount, but by a multiple of that amount. This, again, is a cost which must be recognized in the analysis.

While these repercussive effects are important and should definitely be recognized in any impact analysis, quantification of these effects are less than encouraging. Each of the impacts mentioned above can be, in principle, incorporated within the present analytic framework, but the practical problems of modifying the standard model to incorporate such things as identifying the contributions of the various sectors to the pool of tax revenues, the relative weights to adjust the household sector multipliers, etc., makes its use impractical. Therefore, such considerations such as these should be explicitly recognized in the narrative of the analysis.

All projects extend over time. Impacts are generally yielded intermittently through time. For comparison purposes different weights must be assigned to each value that occurs at different points in time in order to make them comparable. The method of "present value" incorporates the use of interest rates to determine the value of the weights. These rates may bear little relation to the interest rate on borrowed money.

If the rate chosen is too low, future project impacts will appear high. Since benefits tend to occur more in the future than do costs, some projects would appear to be desirable and would thus be undertaken. If the rate is too high, the reverse would hold, and short run projects would appear relatively more attractive than long run projects.

The incorporation of the time dimension within the input-output model context is somewhat limited by an industry's capacity to adopt changes in technology and changes in relative prices. The effort would also be constrained by the practical problems of data availability, costs, forecast reliability, etc. Additionally, the hard question must be asked whether the use of a more complex model would indeed provide substantially greater insights over sound thinking and careful analysis with a much simpler model.

It is also important to give attention to who gains and who pays because of society's interest in the distribution of economic welfare among different groups of people. For example, some public efforts are intended to change the distribution of income as opposed to improving the economy as a whole. Even when a project is not designed to do so, it will have an effect on the distribution as well as the magnitude of economic well-being.

At the present, certain types of impact analyses are not meaningful. The complex nature of estimating impacts may result in unreliability. Also, it is important to be able to distinguish which projects are amenable to this type of analysis. When there are many diverse types of impacts resulting from a project which accrue to many

different beneficiaries, it becomes enormously difficult to list them all and avoid double counting. It is optimistic to believe that the technique will be very accurate when impacts are so widely diffused and there is a significant difference between accounting and economic costs and benefits, or when projects being compared are from different branches of economic activity.

Finally, there is always the problem of uncertainty. This can be introduced from a number of sources: (1) physical constraints which deal with the physical inputs and outputs of a project, (2) legal matters may affect matters in many different ways, such as rights of access, time needed for public inquiries, regulated pricing, and limits to the activities of public agencies, (3) administrative limits as to what can be handled administratively, (4) distribution and budgetary constraints where specific financial rules are not laid down, (5) future price movements of both inputs and outputs associated with the project, (6) possible future events, such as technical innovations, changes in domestic and foreign policies, and (7) vast ranges of alternatives in conditions of demand and supply.

APPLYING IMPACT ASSESSMENT TO WATER REALLOCATION

One of the easier ways to understand impact analysis techniques is to examine some of the illustrative impacts of an actual reallocation decision made in the public sector. A simple, useful example is provided by a recent request by the Honolulu Board of Water Supply to the State Board of Land and Natural Resources for use of 4 mgd of State-owned water presently being used by Oahu Sugar Company via the Waiahole Ditch.

At present, the Waiahole Water Company collects and transports 25 to 30 mgd from the windward and central portions of the Koolaus to the dry Ewa plain for sugarcane irrigation. The State holds the right to withdraw its water from the Waiahole Ditch, provided BWS shows a real need and following a two-year notice.

The Honolulu Board of Water Supply was led to its request by the court order to reduce its anticipated pumping from its Waihee wells. This would "force" BWS either to acquire the State's water at a cost of about \$2 million for transmission lines or to develop new wells at a construction cost of about \$4 million.

The two alternatives involve a series of impacts. If the water is withdrawn from sugar production, there would be an associated loss of jobs, incomes, and sales. If we reasonably assume that the land withdrawn from sugar would be placed in pasture for cattle production, an associated creation of jobs, incomes, and sales would also occur, as

would changes in types of open space and groundwater recharge rates. This alternative would also result in lower construction and operating costs for BWS than if the new wells were developed.

Reasonable estimates of the impacts on jobs, incomes, and sales can be derived by using the input-output model that is discussed in Technical Appendix I. Because of the constant proportion assumption of the model, it is possible to derive impacts of marginal changes in sugar production by using the tables (3 through 5) at the end of Appendix I, which are based on a \$1,000,000 change in sugar production.

The 4 mgd reduction in water supply for Oahu Sugar Company can be interpreted to mean that 500 acres would have to be converted from sugar to other use. This reduction would mean an average reduction annually of about 3,000 tons of sugar for export to mainland refineries. This amounts to a reduction of about \$484,530 in sugar sales, which through the multiplier process would lead to a total reduction in Hawaii's economy of \$1,921,479 in annual sales. (All dollar numbers are in terms of 1977 values.) Such a reduction in production would lead to reductions in annual incomes (wages, profits, dividends) within the State amounting to \$684,518. Job losses would amount to about 42, including about 31 within the sugar industry itself.

The consequent slight expansion in the beef industry is a reasonable possible impact to examine, for the recent history in Hawaii suggests that land withdrawn from sugar is likely to be used for pasture. Estimating these impacts is more difficult from a technical point of view, simply because there are a number of possible steps within Hawaii's economy between the time the product leaves the field until it is finally consumed. In comparison, sugar, which is an export from the local economy, does not have these extensive repercussive effects. The input-output model readily provides impact estimates for "final demand" products, such as sugar, but not for "intermediate" products, such as beef cattle, particularly if they are "import replacements." Due to its technical nature, discussion of the estimating procedure for changes in the beef industry is relegated to Technical Appendix II. The results of that analysis show an increase in total sales annually in the State amounting to \$216,606. Annual income increases would amount to \$38,088. A total of 5 jobs would be created by this expansion in the state's beef industry.

Only one slightly technical calculation remains in order to make comparisons of impacts more easily comprehensible. Some impacts, such as construction costs, are short-range in nature, but others, such as income from agriculture, recur over a much longer period of time. By use of an appropriate discount rate and time horizon, it is possible to convert a series of values over time (such as annuities) into a present value (or capitalization). The choice of a discount rate and time period is somewhat arbitrary, but most practitioners today would utilize something close to 10 percent and a 30-year time horizon, which is what we will use for this illustration. (A full technical discussion of the selection of the discount rate and time period selected is clearly

beyond the scope of this report. Individual agencies, however, may find themselves mandated by law to use particular figures.)

Other impacts would include a possible reduction in groundwater recharge, if it is assumed that the water would be used for furrow irrigation. The extent of this change in recharge rates would be highly dependent on the specific location of the acreage that would be withdrawn from sugar, and only the grossest of estimates would be possible in any case.

Conversion of land from sugar cultivation to beef cattle production also would probably lead to the improvement of the "open space" quality of the acreage involved. Although theoretically possible, it is not practical to attempt to place a dollar value on this impact.

For purposes of ready comparison, the "positive" and "negative" impacts of converting the 4 mgd in question to urban use can be listed in the following fashion:

Negative	Positive
\$6.45 million (present value) reduction in income due to sugar reduction.	\$.35 million (present value) in income gained due to beef increase.
\$18.11 million (present value) reduction in sales due to sugar reduction.	\$2.06 million (present value) in sales gained due to beef increase.
42 jobs lost, including 31 in the sugar industry.	5 jobs gained, including 3 in the beef industry.
Less recharge to groundwater, assuming furrow irrigation.	More desirable open space amounting to 500 acres.
Sugar production costs would rise marginally.	Beef production costs would go down marginally.
	\$2 million less in capital costs, plus unestimated savings in operating costs.

This summary of the impacts would be useful to the decision-making process, but the decision cannot rest on these estimates alone. Other factors not identified as impacts might be of considerable importance, such as the establishment of legal or operational precedents. Furthermore, the estimated impacts might prove to be in serious error. For example, the sugar industry may decline for reasons unrelated to water availability, which means the estimated impact shown is highly overstated. On the other hand, development of alternative water supplies might prove far more costly than anticipated.

These problems of vast uncertainty have been detailed in preceding sections, for it behooves a decision-maker to be fully aware of the degree of approximation involved in making the foregoing estimates. Nevertheless, decisions made in the absence of considering such impacts are likely to be inferior to decisions based on possible scenarios derived from the alternatives being considered. Although the development of such scenarios is necessarily somewhat technical, the results can be readily understood. The preparation of the scenarios rests with the technical analysts, but the decisions rest with individuals who often do not, and could not, command the wide range of expertise necessary for the analysis of a set of society's problems. In such a situation, the people making such decisions must require the analysts to inform them of the likely impacts of the alternatives available.

TECHNICAL APPENDIX I

INPUT-OUTPUT ANALYSIS AND
WATER MANAGEMENT

TECHNICAL APPENDIX I

Input-Output Analysis and Water Management

Introduction

In general, changes in final demand will alter output which, in turn, will alter employment and labor income. If output changes, then the various inputs used in the production of that output will change, corresponding to the output change. But, the inputs to this sector may very well be outputs for other sectors, which must also adjust to the changes in final demand for the other sector's products. This logical flow of economic activity can be carried backwards to the primary resources and forwards to final demand. These activities and inter-relationships among the various sectors within the economy can be quantitatively summarized in an input-output model, such as the State's interindustry model.^{30/}

The Input-Output Model

The model describes the economy through a matrix array of major sectors, as in Figure 1. The rows describe the sales of each of the sectors to the other sectors as intermediate goods and to final demand for consumption. The columns show the purchases of various factor inputs from the various sectors, including payments to households in the form of wages, salaries, dividends, and to governments and other contributors to the value of the output.

Further examination of this table shows that Quadrant I describes the behavior of consumers in the aggregate among the various sectors. Quadrant II isolates the producing sectors where each element in this square array reflect the transactions of intermediate goods and thus, their dependence on each of the various sectors. Quadrant III is the primary inputs section of the model. It consists of the household labor inputs, entrepreneurial capacity, imports, and other value-added items. The last quadrant accounts for the transactions within the economy that do not result in output, but that are merely transfers of purchasing power from one source to another, such as personal savings, personal taxes, welfare and unemployment payments, etc.

Such a table fully describes the economy in terms of the accounting transactions which take place, and generally it is called the transactions matrix or table. With this initial tableau of dollar transactions, two other tables can be constructed: a technical coefficients or direct requirements table and an interdependence or total requirements table. Excluding the household sector, the interdependence table provides the "direct" and "indirect" requirements per dollar of delivery of final demand. Inclusion of the household sector in the table yields

FIGURE 1--Schematic of an Input-Output Model

		PURCHASING INDUSTRIES						FINAL CONSUMPTION SECTORS					
		1	2	3	4	...	N	1	2	3	...	P	
SELLING INDUSTRIES	1	<p style="text-align: center;">LOCAL INTERINDUSTRY TRANSACTIONS (II)</p>						<p style="text-align: center;">EXPENDITURES BY FINAL USERS (I)</p>				TOTAL SALES	
	2												
	3												
	4												
	.												
	N												
FINAL PAYMENT SECTORS	1	WAGE AND SALARY PAYMENTS						<p style="text-align: center;">TRANSFERS (IV)</p>				TOTAL FINAL PAYMENTS (GSP)	
	2												
	3												
	.												
	M												
		TOTAL PURCHASES						TOTAL FINAL EXPENDITURES					

Source: Hawaii State Department of Planning and Economic Development; Interindustry Study of the Hawaiian Economy (Honolulu) 1972; p. 17.

the additional "induced" requirements per dollar of delivery of final demand.

The necessary set of assumptions implicit by the model include: (1) the relative amounts of the various input factors purchased by a sector from the other sectors remains constant, which further implies that relative prices remain constant and that no input substitution occurs; (2) each firm within a sector produces a single, homogeneous product with a single production process, although the heterogeneity of quality within a particular class of outputs does tend to make the analyses derived from this model less realistic; (3) it is assumed that no significant external economies or diseconomies exist that will affect the relative cost structure of firms in each of the sectors.

Given these assumptions, it is possible to derive the remaining tables of the input-output model. The technical coefficients or "direct" requirements table is obtained by dividing each of the column entries by its column total. This indicates the amount by which each input factor is combined in the production process to produce a dollar's worth of output from that sector for delivery to final demand. Any change in any of these sectors will also lead to reductions of output in other sectors. These are the "indirect" requirements or changes in the economy.

With a reduction of output and the consequent reductions in output of related sectors, incomes to households also will be reduced. Assuming that either savings are held constant for short run changes or that the output reductions are permanent, consumption will decrease, leading to further reductions in final demand and output reductions in the various producing sectors. This inclusion of the household sector adds the "induced" effects from an initial change in final demand.

Some Practical Problems of Input-Output Models

In addition to the necessary assumptions implicit in input-output models in general, there are tremendous practical problems of aggregation and data generation. The aggregation of non-homogeneous firms suppresses and averages the effective responses of firms to exogenous disturbances. Furthermore, aggregation may substantially reduce the accuracy of the model as an analytical device, even though it may be necessary in order to make it useful for policy formulation.

The accuracy and reliability of the data may be questionable, particularly if it is not controlled through a formal and well-documented collection procedure.

Since our economy is in constant flux, the ideal model to represent the real world would be a "dynamic" input-output model. It would be dynamic in the sense that the model would incorporate or anticipate changes in the technological state of the various industries and changes in the tastes of consumers within the economy. Although at a glance the

idea of forecasting with a dynamic input-output model seems appealing, major problems reduce the practical value of this type of model.

The additional data requirements beyond the static model requirements are very demanding. Such a comprehensive model would also be more complex in its structure and would therefore be far more costly to build and update. Also, there is a very real question of whether such a model would really be a significant improvement over careful analysis and sound thinking with readily available static input-output information.

Using the Model

Since we know that changes in final demand lead to initial changes in the various sectors as well as repercussive effects, we can quantitatively express these impacts by utilizing the coefficients from the interdependence tables, employment coefficients derived independently of the input-output tables, and income coefficients that can be retrieved from the technical coefficients table.

Output coefficients can be obtained from the total requirements tables, both direct-plus-indirect and direct-plus-indirect-plus-induced, by locating the appropriate column of the affected sector. An additional assumption is made to derive employment coefficients: a linear relationship exists between employment in a particular sector and that sector's output. The ratio between sector employment and output can then be derived to estimate the direct employment coefficients. The household row of the technical coefficients table yields the direct income coefficients. These coefficients tell us the change in personal income resulting from a dollar change in final demand.

Given a change in final demand (in dollar terms), coefficients from the appropriate columns of the direct-plus-indirect table and the direct-plus-indirect-plus-induced tables are multiplied together to yield both direct-plus-indirect output changes in the various sectors due to the initial change in final demand and direct-plus-indirect-plus-induced sectoral output changes. The net difference between the two estimates is the induced change in output. This is depicted in Figure 2.

The direct-plus-indirect change in output and the induced change in output, along with the direct income and direct employment coefficients, can then be used to estimate the income and employment effects from the change in final demand. The procedure, shown in Figures 3 and 4, is simply that of multiplying both the direct-plus-indirect output change and the induced output change with either the direct income or direct employment coefficients. For the income effect, this will yield both the direct-plus-indirect change in personal income due to the change in final demand and the induced change in personal income. The employment effect has the same kind of interpretation. Summing the direct-plus-indirect change with the induced change yields the total change in both personal income and employment.

FIGURE 2--Methodology to Calculate Output Effects

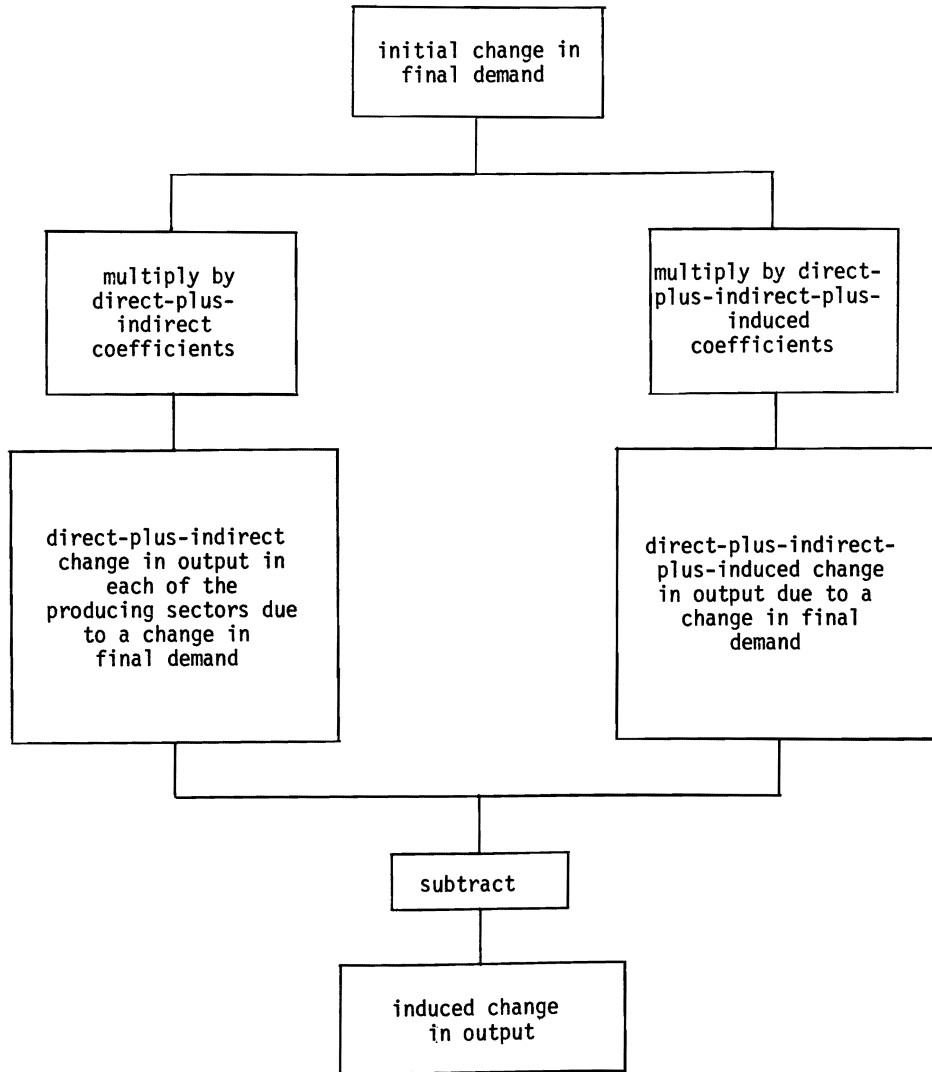


FIGURE 3--Methodology to Calculate Income Effects

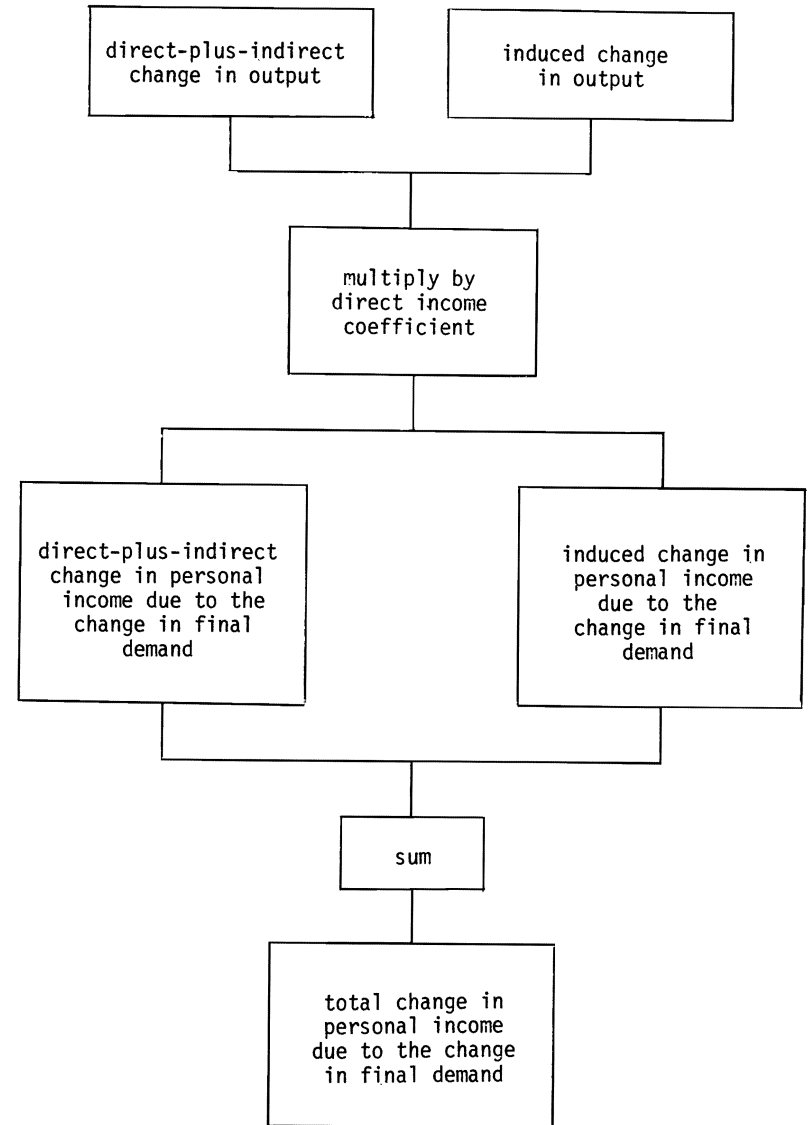
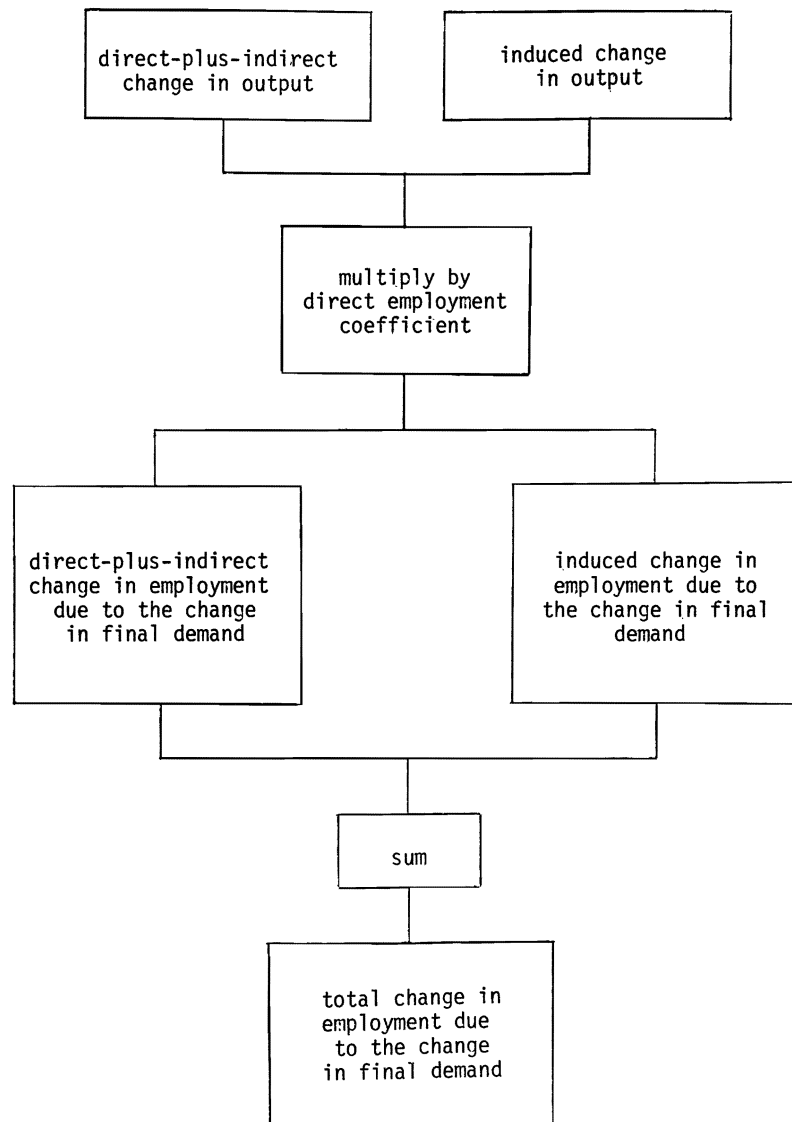


FIGURE 4--Methodology to Calculate Employment Effects



The input-output model currently used by the Research and Economic Analysis Division of the Department of Planning and Economic Development consists of 26 sectors and is based on 1970 dollars. This model is used in this report. The original Input-Output tables, developed in 1967, consisted of 54 sectors utilizing data from five sources: survey data on purchases and sales of selected industries, the 1963 National Input-Output Study, national price indices, 1967 estimates of gross sales and purchases by industries, and the 1967 Gross State Product.

Because the model was constructed primarily through secondary sources, qualifications must be kept in mind in interpreting the analytic results. The first qualification is the technology of the various sectors. Because of the assumption of constant technology, it is important that the model, at least initially, reflect the existing state of technology in Hawaii. Another area of significance is the product-mix question. This deals primarily with the problem of aggregation of industries subsumed in a given sector which may or may not be valid for Hawaii's economy.

Impact Analysis: An Application to Water Management

Suppose that final demand for sugar processing changes by \$1,000,000 due to a change in one of its input factors, such as the water supply. What are the likely impacts on the economy due to the change in the final demand for sugar processing? We can estimate the impacts on the economy by utilizing the methodology outlined above.

Table 1 presents the total requirements columns for the sugar processing sector (both the direct-plus-indirect and the direct-plus-indirect-plus-induced coefficients). Table 2 lists the direct employment and income coefficients for each of the 26 sectors. Both tables, when used in conjunction with the hypothetical change in final demand, yield the results presented in Tables 3, 4, and 5, which show estimates of the changes in output, personal income, and employment, respectively, in the economy for each major sector.

TABLE 1--Total Requirements Per Dollar of Delivery to Final Demand:
Sugar Processing

Industry	Direct-Plus-Indirect	Direct-Plus-Indirect-Plus-Induced
Sugarcane and Other Field Crops	0.59873	0.59885
Pineapple, Fruits, Nuts, and Vegetables	0.0	0.00225
Canned Fruits, Vegetables, and Sea Foods	0.0	0.00084
Sugar Processing	1.00270	1.00290
Beef, Hog, Poultry, and Dairy Farms	0.00037	0.00936
Other Agricultural Products and Fishery	0.00001	0.00114
Other Food Processing	0.00053	0.02777
Textiles and Apparel	0.00184	0.00755
Lumber and Wood Products	0.00227	0.00697
Printing and Publishing	0.00370	0.00969
Petroleum Refining	0.01740	0.02371
Miscellaneous Manufacturing	0.06414	0.07496
Construction	0.00475	0.01116
Transportation and Warehousing	0.02237	0.03681
Communication	0.00366	0.02250
Electricity, Gas and Sanitary Services	0.00560	0.02182
Wholesale Trade	0.02961	0.06299
Retail Trade	0.00765	0.07404
Eating and Drinking Places	0.0	0.02166
Banking, Finance, and Real Estate	0.01462	0.13423
Hotels	0.0	0.00409
Personal Services	0.00027	0.01327
Business Services	0.01295	0.01956
Health and Professional Services	0.01458	0.05601
Other Services	0.02522	0.06489
Dummy Industries and Others	0.02384	0.03928

Source: DPED updated coefficients (unpublished).

TABLE 2--Direct Coefficients

Industry	Employment	Income
Sugarcane and Other Field Crops	46.4814	0.4096
Pineapple, Fruits, Nuts, and Vegetables	60.9505	0.4498
Canned Fruits, Vegetables, and Sea Foods	35.5557	0.2746
Sugar Processing	23.6798	0.2582
Beef, Hog, Poultry, and Dairy Farms	31.1675	0.1121
Other Agricultural Products and Fishery	31.1068	0.2832
Other Food Processing	25.3778	0.2423
Textiles and Apparel	60.5173	0.4105
Lumber and Wood Products	31.7384	0.3295
Printing and Publishing	43.5030	0.5065
Petroleum Refining	3.6234	0.3419
Miscellaneous Manufacturing	21.7195	0.3827
Construction	29.0228	0.5039
Transportation and Warehousing	56.1616	0.5804
Communication	45.7225	0.5430
Electricity, Gas and Sanitary Services	22.8300	0.3557
Wholesale Trade	51.5974	0.6094
Retail Trade	76.6609	0.5557
Eating and Drinking Places	62.3659	0.3792
Banking, Finance, and Real Estate	27.1275	0.5839
Hotels	55.1663	0.3965
Personal Services	42.0573	0.4620
Business Services	70.0595	0.6141
Health and Professional Services	38.7458	0.4997
Other Services	36.8857	0.4632
Dummy Industries and Others	46.4179	0.2600

Source: DPED updated coefficients (unpublished).

TABLE 3--Output Changes Due to a \$1,000,000 Change in the Final Demand in Sugar Processing

Industry	Direct-Plus- Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	598,730	120	598,850
Pineapple, Fruits, Nuts, and Vegetables	0	2,250	2,250
Canned Fruits, Vegetables, and Sea Foods	0	8,400	8,400
Sugar Processing	1,002,700	200	1,002,900
Beef, Hog, Poultry, and Dairy Farms	370	8,990	9,360
Other Agricultural Products and Fishery	10	1,130	1,140
Other Food Processing	530	27,240	27,770
Textiles and Apparel	1,840	5,710	7,550
Lumber and Wood Products	2,270	4,700	6,970
Printing and Publishing	3,700	5,990	9,690
Petroleum Refining	17,400	6,310	23,710
Miscellaneous Manufacturing	64,140	10,820	74,960
Construction	4,750	6,410	11,160
Transportation and Warehousing	22,370	14,440	36,810
Communication	3,660	18,840	22,500
Electricity, Gas and Sanitary Services	5,600	16,220	21,820
Wholesale Trade	29,610	33,380	62,990
Retail Trade	7,650	66,390	74,040
Eating and Drinking Places	0	21,660	21,660
Banking, Finance, and Real Estate	14,620	119,610	134,230
Hotels	0	4,090	4,090
Personal Services	270	13,000	13,270
Business Services	12,950	6,610	19,560
Health and Professional Services	14,580	41,430	56,010
Other Services	25,220	39,670	64,890
Dummy Industries and Others	23,840	15,440	39,280
TOTALS*	1,856,810	499,050	2,355,860

TABLE 4--Income Changes Due to a \$1,000,000 Change in the Final Demand in Sugar Processing

Industry	Direct-Plus- Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	245,239.81	49.15	245,288.96
Pineapple, Fruits, Nuts, and Vegetables	0.00	1,012.05	1,021.05
Canned Fruits, Vegetables, and Sea Foods	0.00	2,306.64	2,306.64
Sugar Processing	258,897.14	51.64	258,948.78
Beef, Hog, Poultry, and Dairy Farms	41.48	1,007.78	1,049.26
Other Agricultural Products and Fishery	2.83	320.02	322.85
Other Food Processing	128.42	6,600.25	6,728.67
Textiles and Apparel	757.16	2,349.67	3,106.83
Lumber and Wood Products	747.97	1,548.65	2,296.62
Printing and Publishing	1,874.05	3,033.94	4,907.99
Petroleum Refining	5,949.06	2,157.39	8,106.45
Miscellaneous Manufacturing	24,546.38	4,140.81	28,687.19
Construction	2,393.53	3,230.00	5,623.52
Transportation and Warehousing	12,983.55	8,380.98	21,364.52
Communication	198.74	1,023.01	1,221.75
Electricity, Gas and Sanitary Services	1,991.92	5,769.45	7,761.37
Wholesale Trade	18,044.33	20,341.77	38,386.11
Retail Trade	4,251.11	36,892.92	41,144.03
Eating and Drinking Places	0.00	8,213.47	8,213.47
Banking, Finance, and Real Estate	8,536.62	69,840.28	78,376.90
Hotels	0.00	1,621.69	1,621.69
Personal Services	124.74	6,006.00	6,130.74
Business Services	7,952.60	4,059.20	12,011.80
Health and Professional Services	7,285.63	20,702.57	27,988.20
Other Services	11,681.90	18,375.14	30,057.05
Dummy Industries and Others	6,198.40	4,014.40	10,212.80
TOTALS*	619,827.34	233,048.87	852,876.21

*Totals may not add up due to rounding.

TABLE 5--Employment Changes Due to a \$1,000,000 Change in the Final Demand in Sugar Processing

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	28	n**	28
Pineapple, Fruits, Nuts, and Vegetables	0	n	n
Canned Fruits, Vegetables, and Sea Foods	0	n	n
Sugar Processing	24	n	24
Beef, Hog, Poultry, and Dairy Farms	n	n	n
Other Agricultural Products and Fishery	n	n	n
Other Food Processing	n	1	1
Textiles and Apparel	n	n	n
Lumber and Wood Products	n	n	n
Printing and Publishing	n	n	n
Petroleum Refining	n	n	n
Miscellaneous Manufacturing	1	n	2
Construction	n	n	n
Transportation and Warehousing	1	1	2
Communication	n	1	1
Electricity, Gas and Sanitary Services	n	n	n
Wholesale Trade	2	2	3
Retail Trade	1	5	6
Eating and Drinking Places	0	1	1
Banking, Finance, and Real Estate	n	3	4
Hotels	0	n	n
Personal Services	n	1	1
Business Services	1	n	1
Health and Professional Services	1	2	3
Other Services	2	3	6
Dummy Industries and Others	1	1	2
TOTALS*	62	23	35

*Totals may not add up due to rounding.

**Number is less than 5

*This Appendix was prepared and written by Dr. Gary R. Vieth, University of Hawaii, College of Tropical Agriculture, Department of Agriculture and Resource Economics.

TECHNICAL APPENDIX II*
 IMPACTS OF THE BEEF GRAZING INDUSTRY

TECHNICAL APPENDIX II

The purpose of this section is to analyze the economic impact on the State of Hawaii of a \$100,000 change in the output of the beef grazing industry. The Hawaii interindustry model is used in the analysis, with 1970 prices as the base year for the model.

Beef Industry

The output of the beef grazing industry is composed of two products: animals which are grass-fattened for slaughter and those which will be placed in feedlots for further fattening. The first task is to divide the change in output into the two types of products. This was accomplished by using 1976 physical production data and 1970 prices for the two types of beef. Seventy percent of the change in output (\$70,000) is estimated to be the value of animals going to feedlots and 30 percent (\$30,000) the value of grass-fattened animals.

The beef and hog sector of the industry includes feedlot as well as grazing activities. The value of the animals entering the feedlot (\$70,000) must be converted to the value at the end of the fattening activity to measure the true change in the output of the beef industry. The following figures were used to estimate the increase in value from the feedlot activity:

- \$.02 per animal per day feedlot charge
- 5.76 pounds of feed per pound of gain
(feed conversion rate)
- \$4.90 per hundred weight of feed
(1970 price)
- 754 pounds - weight at which animal enters
feedlot (live weight)
- 1,065 pounds - weight at which animal is
slaughtered (live weight)

The value of a feeder entering the lot was estimated to be \$192.97 per head and its slaughter value to be \$282.23 per head. The difference reflects the increase in value due to the feedlot operation. Therefore, the \$70,000 change in feeder cattle output means a \$102,377 increase in the output of the beef industry. The total change in output of the beef industry is \$102,377 in feedlot beef, plus \$30,000 in grass-fattened beef for a total change of \$132,377. (The \$30,000 increase in grass-fattened beef is composed of 1,336.3 cwt live weight at \$22.45 per cwt. The typical animal weighs 800 pounds.)

Movement Through the Economy

For purposes of this analysis, it is assumed that the increase (decrease) in feedlot-fattened cattle will be reflected by an increase (decrease) in sales to the meat products industry. The meat products industry will in turn increase (decrease) the sales of their product to restaurants ("eating and drinking places" sector) which will adjust their imports accordingly.

The purchases of the meat products sector from the beef industry is 44.2 percent of the output of the meat products sector. To enable a \$102,377 change in this transaction, the output of the meat products sector must change by \$231,538. This change in output is then reflected in the purchases of "eating and drinking places" from the meat products and imports sectors by a magnitude of \$231,538. The changes will be of equal size but opposite directions depending on whether the initial change was an increase or decrease.

It is assumed that grass-fattened cattle are sold directly to households and serve as a substitute for imported New Zealand grass-fed beef. Thus, a change of \$30,000 in the output of grass-fattened beef will be reflected by a change of \$30,000 in the purchases of households from the beef industry. The retail sector is assumed to be the importer of the substitute product. However, the output of the retail sector is valued at the margin. Standard industry practice is to use a mark-up of 30 percent of the sales value of meat products. To reflect a change of \$30,000 in the imports of grass-fed beef, the purchases of households from retail trade must be changed by \$9,000 and the imports by households by \$21,000.

Adjustment of the Interindustry Model

The changes mentioned in the previous section can be reflected in the transactions matrix to the extent that they will result in changes in the structure of the economy, i.e., the technical coefficients (dollars purchased per dollar of output) matrix. The changes which need to be incorporated are those in which new local purchases substitute for imports or in which a given sector is no longer a linkage in the distribution system of a given product.

Specific Changes for an Increase of \$100,000 in the Beef Grazing Industry

The following changes are required in the transaction matrix for a \$100,000 increase in the output of the beef grazing industry.

1. Increase the purchases of eating and drinking places from meat processing by \$231,538.

2. Decrease the imports purchases of eating and drinking places by \$231,538.
3. Increase the purchases of households from the beef industry by \$30,000.
4. Decrease the purchases of households from retail trade by \$9,000.
5. Decrease import purchases of households by \$21,000.

The interindustry model can now be mathematically manipulated to determine the changes in output, household income, and employment. These results are presented in Tables 1, 2, and 3.

Estimates for the Kahana Valley Diversion Example

The illustration discussed in the text incorporated the conversion of 500 acres into a cow-calf operation. If we reasonably assume that the pasture on this acreage is rated at a carrying capacity of one "animal-unit" per acre, it can be demonstrated by various simulation approaches that a "steady state" condition of production results in .3375 steers sold per year. This allows for deaths, replacements, non-calving cows, and adjusts for the sales of "culls" which result in varying sales figures per animal.31/

Calculation of the effects of the Kahana Valley diversion example thus becomes straightforward. Total acreage (500) is multiplied by the "animal-unit" rating (1), which is multiplied by the price per head in 1970 terms (\$192.97) to give total sales at the farm gate. The resultant figure of \$32,563.69 is then used as a proportion of the \$100,000 sales figure used in the following three tables. The dollar figures are then converted to 1977 dollars by use of the indexes shown in the table in the following appendix. The sectoral results are presented in Tables 5 through 7, also in the following appendix.

TABLE 1--Output Changes Due to a \$100,000 Change in Beef Grazing, 1970

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	2,873	18	2,891
Pineapple, Fruits, Nuts, and Vegetables	0	338	338
Canned Fruits, Vegetables, and Sea Foods	0	126	126
Sugar Processing	4,811	30	4,841
Beef, Hog, Poultry, and Dairy Farms	133,502	1,363	134,865
Other Agricultural Products and Fishery	293	169	462
Other Food Processing	244,885	4,095	248,980
Textiles and Apparel	9	857	866
Lumber and Wood Products	199	708	907
Printing and Publishing	981	902	1,883
Petroleum Refining	554	936	1,490
Miscellaneous Manufacturing	1,414	1,622	3,036
Construction	695	1,108	1,803
Transportation and Warehousing	6,185	2,190	8,375
Communication	784	2,802	3,586
Electricity, Gas and Sanitary Services	1,264	2,415	3,680
Wholesale Trade	9,410	5,019	14,429
Retail Trade	1,759	9,973	11,732
Eating and Drinking Places	0	3,250	3,250
Banking, Finance, and Real Estate	2,084	17,781	19,865
Hotels	0	614	614
Personal Services	570	1,952	2,521
Business Services	2,202	937	3,139
Health and Professional Services	1,328	6,186	7,513
Other Services	2,424	5,957	8,381
Dummy Industries and Others	1,552	2,257	3,809
TOTALS*	419,779	73,603	493,382

*Totals may not add up due to rounding.

TABLE 2--Income Changes Due to a \$100,000 Change in Beef Grazing, 1970

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	786	5	791
Pineapple, Fruits, Nuts, and Vegetables	0	102	102
Canned Fruits, Vegetables, and Sea Foods	0	23	23
Sugar Processing	830	5	835
Beef, Hog, Poultry, and Dairy Farms	10,963	103	11,066
Other Agricultural Products and Fishery	92	41	133
Other Food Processing	37,656	666	38,322
Textiles and Apparel	2	235	237
Lumber and Wood Products	55	132	187
Printing and Publishing	332	305	637
Petroleum Refining	127	214	340
Miscellaneous Manufacturing	298	410	708
Construction	234	373	607
Transportation and Warehousing	2,416	836	3,252
Communication	284	1,016	1,301
Electricity, Gas and Sanitary Services	300	574	874
Wholesale Trade	3,830	2,043	5,873
Retail Trade	653	3,702	4,355
Eating and Drinking Places	0	823	823
Banking, Finance, and Real Estate	728	7,256	7,983
Hotels	0	163	163
Personal Services	176	602	778
Business Services	903	384	1,287
Health and Professional Services	443	2,065	2,508
Other Services	832	1,865	2,697
Dummy Industries and Others	122	342	464
TOTALS*	62,062	24,283	86,345

*Totals may not add up due to rounding.

TABLE 3--Employment Changes Due to a \$100,000 Change in Beef Grazing, 1970

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	n	n	n
Pineapple, Fruits, Nuts, and Vegetables	0	n	n
Canned Fruits, Vegetables, and Sea Foods	0	n	n
Sugar Processing	n	n	n
Beef, Hog, Poultry, and Dairy Farms	5	n	5
Other Agricultural Products and Fishery	n	n	n
Other Food Processing	4	n	4
Textiles and Apparel	n	n	n
Lumber and Wood Products	n	n	n
Printing and Publishing	n	n	n
Petroleum Refining	n	n	n
Miscellaneous Manufacturing	n	n	n
Construction	n	n	n
Transportation and Warehousing	n	n	n
Communication	n	n	n
Electricity, Gas and Sanitary Services	n	n	n
Wholesale Trade	1	n	1
Retail Trade	n	1	1
Eating and Drinking Places	n	n	n
Banking, Finance, and Real Estate	n	1	1
Hotels	0	n	n
Personal Services	n	n	n
Business Services	n	n	n
Health and Professional Services	n	n	n
Other Services	n	1	1
Dummy Industries and Others	n	n	n
TOTALS*	11	4	15

*Totals may not add up due to rounding.

TECHNICAL APPENDIX III

INTERINDUSTRY TABLES

Industry	Price Index* (1970 = 100)	Notes; Source**
Sugarcane and Other Field Crops	167.1	HDB, HSH
Pineapple, Fruits, Nuts, and Vegetables	162.8	HDB, HSH
Canned Fruits, Vegetables, and Sea Foods	105.1	HDB, HSH
Sugar Processing	181.8	HDB
Beef, Hog, Poultry, and Dairy Farms	172.2	HDB, HSH
Other Agricultural Products and Fishery	172.2	HDB, HSH
Other Food Processing	105.1	HDB, HSH
Textiles and Apparel	131.5	HDB, HSH
Lumber and Wood Products	140.2	HDB, HSH
Printing and Publishing	149.3	HDB, HSH
Petroleum Refining	171.1	HDB, HSH
Miscellaneous Manufacturing	149.3	HDB, HSH
Construction	186.3	High-rise buildings; EI
Transportation and Warehousing	143.4	HDB, HSH
Communication	149.3	HDB, HSH
Electricity, Gas and Sanitary Services	171.6	HDB, HSH
Wholesale Trade	177.9	US WPI; EI
Retail Trade	149.3	HDB, HSH
Eating and Drinking Places	167.8	HDB, HSH
Banking, Finance, and Real Estate	149.3	HDB, HSH
Hotels	140.2	HDB, HSH
Personal Services	156.1	HDB, HSH
Business Services	149.3	HDB, HSH
Health and Professional Services	169.5	Medical care; HDB, HSH
Other Services	126.5	HDB, HSH
Dummy Industries and Others	149.3	HDB, HSH

*Conversion to 1977 dollars.

**Sources: Hawaii, Data Book 1977 [HDB] (Honolulu) 1977; Schmitt, Robert C., Historical Statistics of Hawaii [HSH] (University Press of Hawaii: Honolulu) 1977; First Hawaiian Bank, Economic Indicators [EI] (Honolulu) various issues.

TABLE 2--Output Effects Due to a Reduction in Sugar Processing, 1977 Dollars

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	484,762	97	484,859
Pineapple, Fruits, Nuts, and Vegetables	0	1,775	1,775
Canned Fruits, Vegetables, and Sea Foods	0	4,278	4,278
Sugar Processing	883,253	176	883,430
Beef, Hog, Poultry, and Dairy Farms	308	7,501	7,809
Other Agricultural Products and Fishery	9	944	952
Other Food Processing	270	13,872	14,142
Textiles and Apparel	1,173	3,639	4,812
Lumber and Wood Products	1,542	3,192	4,735
Printing and Publishing	2,677	4,333	7,010
Petroleum Refining	14,425	5,231	19,656
Miscellaneous Manufacturing	46,399	7,828	54,227
Construction	4,289	5,786	10,075
Transportation and Warehousing	15,543	10,034	25,577
Communication	2,647	13,630	16,277
Electricity, Gas and Sanitary Services	4,656	13,486	18,142
Wholesale Trade	25,523	28,774	54,297
Retail Trade	5,535	48,027	53,561
Eating and Drinking Places	0	17,611	17,611
Banking, Finance, and Real Estate	10,576	86,527	97,103
Hotels	0	2,779	2,779
Personal Services	204	9,833	10,037
Business Services	9,369	4,782	14,151
Health and Professional Services	11,973	34,025	45,998
Other Services	15,458	24,315	39,773
Dummy Industries and Others	17,246	11,169	28,415
TOTALS*	1,557,839	363,640	1,921,479

*Totals may not add up due to rounding.

TABLE 3--Income Effects Due to a Reduction in Sugar Processing, 1977 Dollars

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	198,558.33	39.79	198,598.12
Pineapple, Fruits, Nuts, and Vegetables	0.00	798.32	798.32
Canned Fruits, Vegetables, and Sea Foods	0.00	1,174.64	1,174.64
Sugar Processing	228,056.16	45.49	228,101.64
Beef, Hog, Poultry, and Dairy Farms	34.61	840.85	875.46
Other Agricultural Products and Fishery	2.36	267.01	269.37
Other Food Processing	65.39	3,361.12	3,426.51
Textiles and Apparel	482.43	1,497.11	1,979.55
Lumber and Wood Products	508.10	1,052.02	1,560.12
Printing and Publishing	1,355.69	2,194.75	3,550.44
Petroleum Refining	4,931.96	1,788.54	6,720.50
Miscellaneous Manufacturing	17,756.94	2,995.48	20,752.42
Construction	2,160.60	2,915.65	5,076.25
Transportation and Warehousing	9,021.18	5,823.24	14,844.42
Communication	143.78	740.05	883.83
Electricity, Gas and Sanitary Services	1,656.18	4,797.03	6,453.21
Wholesale Trade	15,553.83	17,534.18	33,088.01
Retail Trade	3,075.27	26,688.46	29,763.73
Eating and Drinking Places	0.00	6,677.89	6,677.89
Banking, Finance, and Real Estate	6,175.42	50,522.69	56,698.11
Hotels	0.00	1,101.64	1,101.64
Personal Services	94.35	4,542.65	4,637.00
Business Services	5,752.93	2,936.43	8,689.36
Health and Professional Services	5,983.54	17,002.58	22,986.12
Other Services	7,160.19	11,262.69	18,422.88
Dummy Industries and Others	4,483.94	2,904.03	7,387.98
TOTALS*	513,013.18	171,504.34	684,517.52

*Totals may not add up due to rounding.

TABLE 4--Employment Effects Due to a Reduction in Sugar Processing, 1977 Dollars

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	14	n	14
Pineapple, Fruits, Nuts, and Vegetables	0	n	n
Canned Fruits, Vegetables, and Sea Foods	0	n	n
Sugar Processing	12	n	12
Beef, Hog, Poultry, and Dairy Farms	n	n	n
Other Agricultural Products and Fishery	n	n	n
Other Food Processing	n	n	n
Textiles and Apparel	n	n	n
Lumber and Wood Products	n	n	n
Printing and Publishing	n	n	n
Petroleum Refining	n	n	n
Miscellaneous Manufacturing	n	n	1
Construction	n	n	n
Transportation and Warehousing	n	n	1
Communication	n	n	1
Electricity, Gas and Sanitary Services	n	n	n
Wholesale Trade	1	1	2
Retail Trade	n	2	3
Eating and Drinking Places	0	n	n
Banking, Finance, and Real Estate	n	1	2
Hotels	0	n	n
Personal Services	n	n	n
Business Services	n	n	1
Health and Professional Services	n	1	1
Other Services	1	1	2
Dummy Industries and Others	n	n	1
TOTALS*	31	13	42

*Totals may not add up due to rounding.

TABLE 5--Output Effects Due to an Increase in Beef Grazing, 1977 Dollars

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	1,563	10	1,573
Pineapple, Fruits, Nuts, and Vegetables	0	179	179
Canned Fruits, Vegetables, and Sea Foods	0	43	43
Sugar Processing	2,848	18	2,866
Beef, Hog, Poultry, and Dairy Farms	74,862	764	75,626
Other Agricultural Products and Fishery	164	95	259
Other Food Processing	83,812	1,401	85,213
Textiles and Apparel	4	367	371
Lumber and Wood Products	91	323	414
Printing and Publishing	478	439	916
Petroleum Refining	309	522	830
Miscellaneous Manufacturing	687	788	1,476
Construction	422	672	1,094
Transportation and Warehousing	2,888	1,023	3,911
Communication	381	1,362	1,744
Electricity, Gas and Sanitary Services	707	1,350	2,056
Wholesale Trade	5,452	2,907	8,359
Retail Trade	855	4,849	10,746
Eating and Drinking Places	0	1,776	1,776
Banking, Finance, and Real Estate	1,013	8,645	9,658
Hotels	0	280	280
Personal Services	290	992	1,281
Business Services	1,071	456	1,526
Health and Professional Services	733	3,414	4,147
Other Services	998	2,454	3,453
Dummy Industries and Others	755	1,097	1,852
TOTALS*	180,381	36,226	216,606

*Totals may not add up due to rounding.

TABLE 6--Income Effects Due to an Increase in Beef Grazing, 1977 Dollars

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	427.70	2.72	430.42
Pineapple, Fruits, Nuts, and Vegetables	0.00	54.07	54.07
Canned Fruits, Vegetables, and Sea Foods	0.00	7.87	7.87
Sugar Processing	491.38	2.96	494.33
Beef, Hog, Poultry, and Dairy Farms	6,147.56	57.76	6,205.32
Other Agricultural Products and Fishery	51.59	22.99	74.58
Other Food Processing	12,887.76	227.94	13,115.69
Textiles and Apparel	0.86	100.63	101.49
Lumber and Wood Products	25.11	60.27	85.38
Printing and Publishing	161.41	148.29	309.70
Petroleum Refining	70.76	119.24	189.44
Miscellaneous Manufacturing	144.88	199.34	344.22
Construction	141.96	226.29	368.25
Transportation and Warehousing	1,128.20	390.39	1,518.59
Communication	138.08	493.96	632.53
Electricity, Gas and Sanitary Services	167.64	320.75	488.39
Wholesale Trade	2,218.79	1,183.54	3,402.33
Retail Trade	317.48	1,799.85	2,117.33
Eating and Drinking Places	0.00	449.71	449.71
Banking, Finance, and Real Estate	353.94	3,527.75	3,881.20
Hotels	0.00	74.42	74.42
Personal Services	89.47	306.01	395.48
Business Services	439.02	186.70	625.72
Health and Professional Services	244.52	1,139.80	1,384.33
Other Services	342.73	768.26	1,110.99
Dummy Industries and Others	59.31	166.27	225.59
TOTALS*	26,050.15	12,037.78	38,087.36

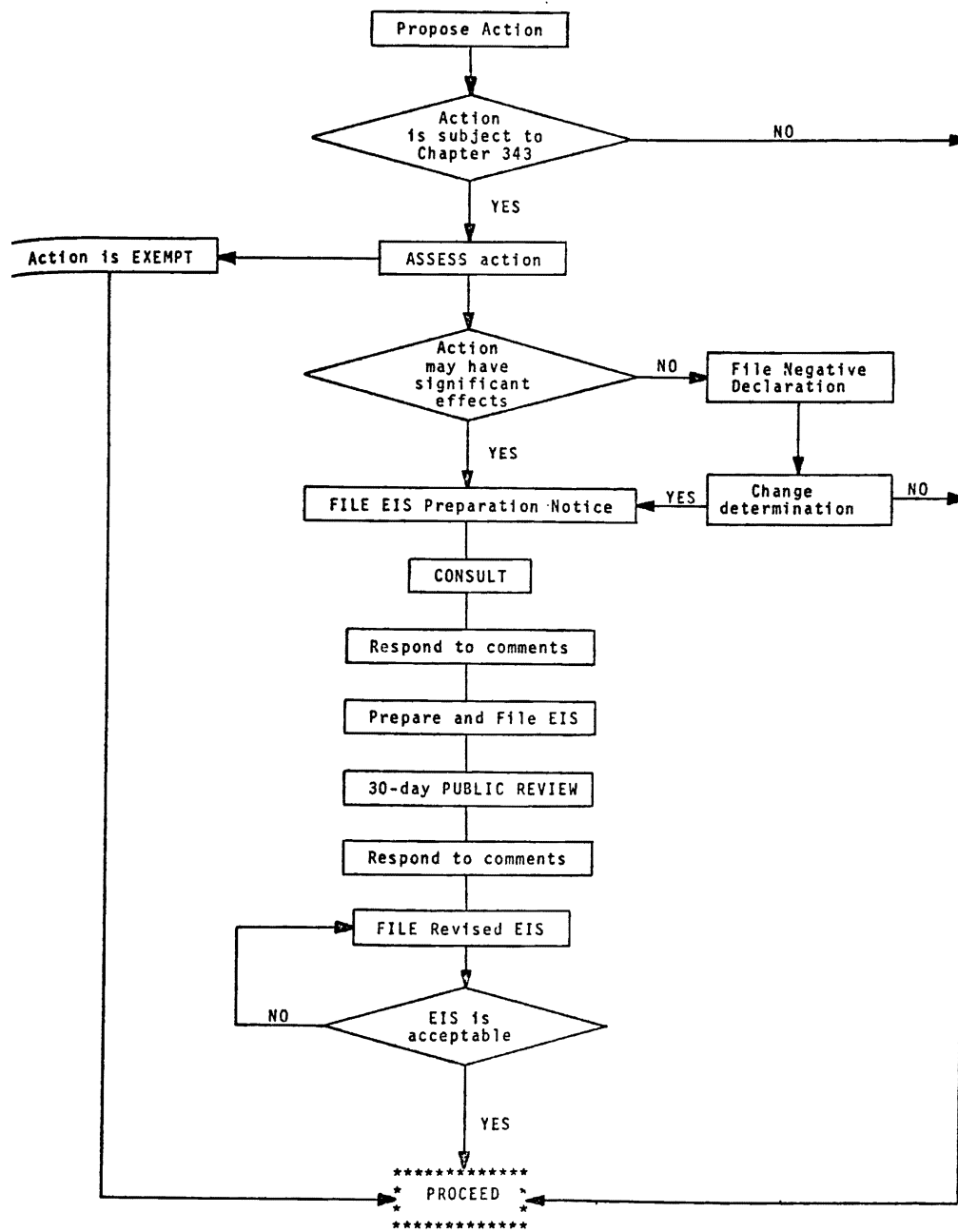
*Totals may not add up due to rounding.

TABLE 7--Employment Effects Due to an Increase in Beef Grazing, 1977 Dollars

Industry	Direct-Plus-Indirect*	Induced*	Total*
Sugarcane and Other Field Crops	n	n	n
Pineapple, Fruits, Nuts, and Vegetables	0	n	n
Canned Fruits, Vegetables, and Sea Foods	0	n	n
Sugar Processing	n	n	n
Beef, Hog, Poultry, and Dairy Farms	2	n	2
Other Agricultural Products and Fishery	n	n	n
Other Food Processing	1	n	1
Textiles and Apparel	n	n	n
Lumber and Wood Products	n	n	n
Printing and Publishing	n	n	n
Petroleum Refining	n	n	n
Miscellaneous Manufacturing	n	n	n
Construction	n	n	n
Transportation and Warehousing	n	n	n
Communication	n	n	n
Electricity, Gas and Sanitary Services	n	n	n
Wholesale Trade	n	n	n
Retail Trade	n	n	n
Eating and Drinking Places	n	n	n
Banking, Finance, and Real Estate	n	n	n
Hotels	0	n	n
Personal Services	n	n	n
Business Services	n	n	n
Health and Professional Services	n	n	n
Other Services	n	n	n
Dummy Industries and Others	n	n	n
TOTALS*	3	1	5

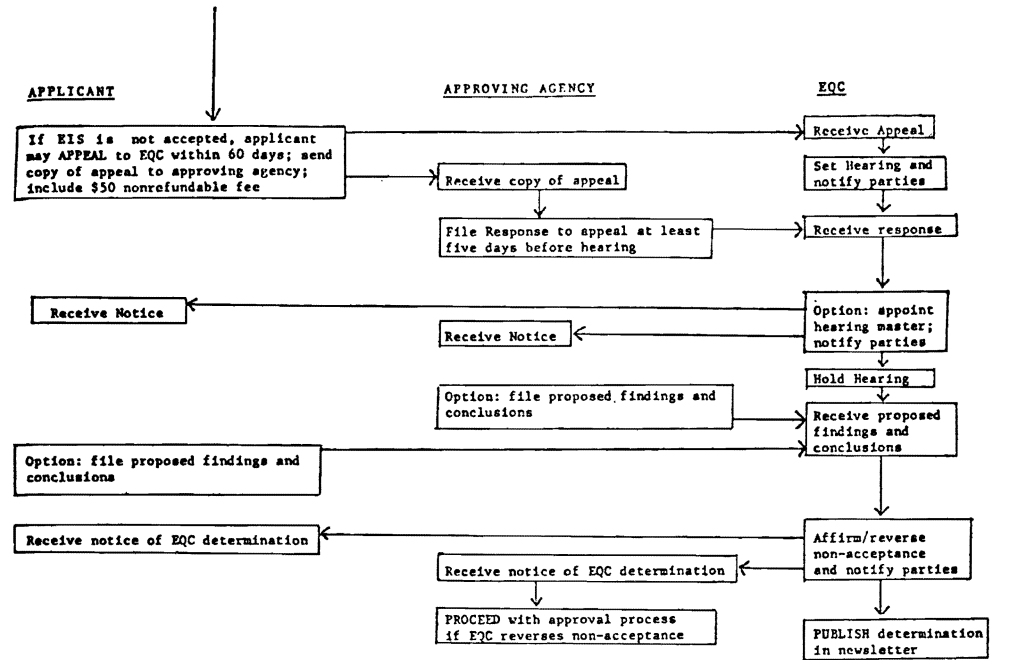
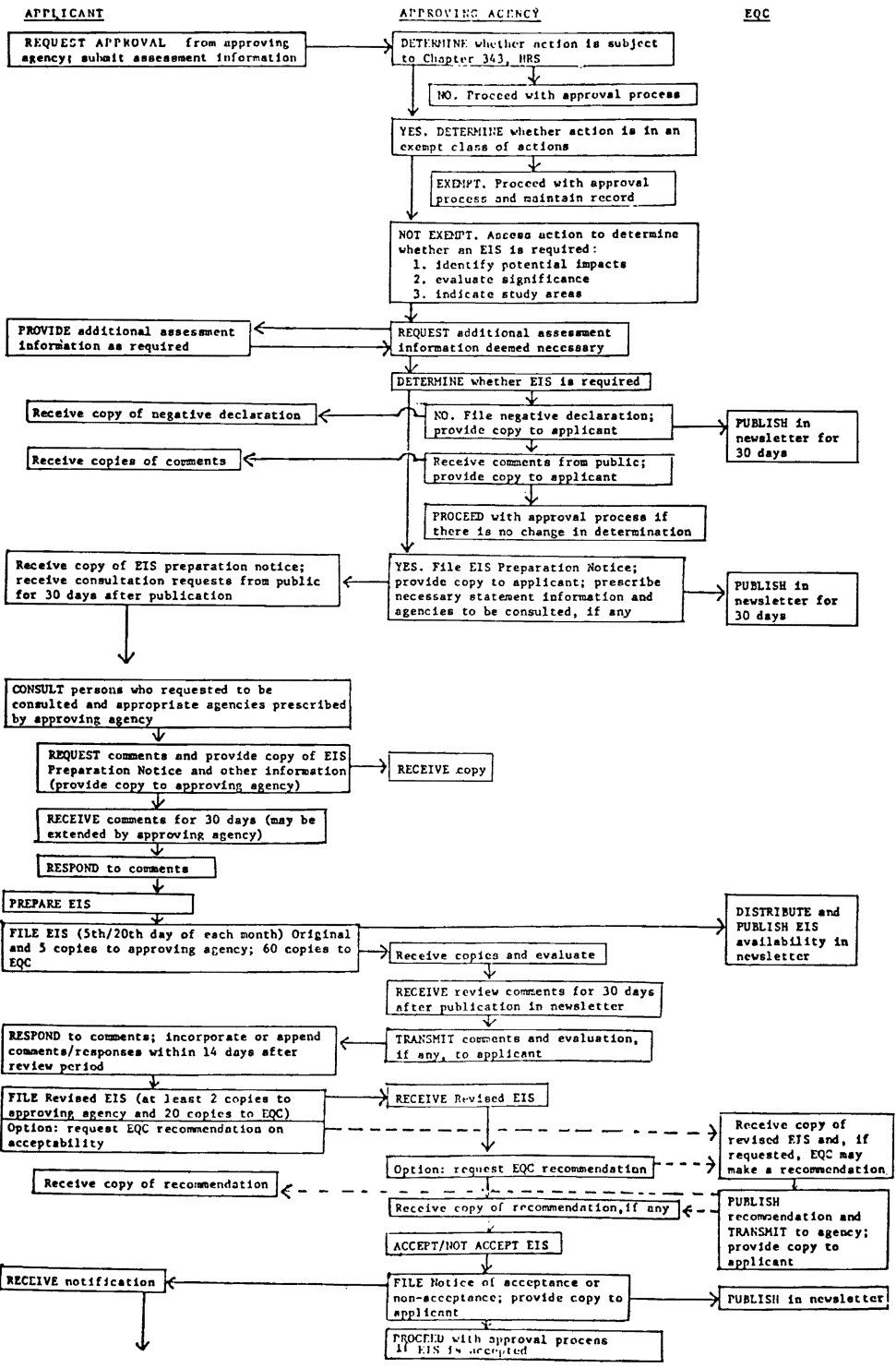
*Totals may not add up due to rounding.

TECHNICAL APPENDIX IV*
EIS PROCESSES AND PROCEDURES



*Taken from the Hawaii Environmental Quality Commission's publication.

FIGURE 3-- EIS PROCEDURES FOR APPLICANT PROPOSED ACTIONS



FOOTNOTES

1. Harvey Doerksen, "Water, Politics, and Ideology: An Overview of Water Resources Management," in "A Symposium: Water Resources Management," Symposium editors, Paul L. Beckett and Berton L. Lamb, Public Administration Review, (Washington, D.C.: ASPA) September/October, 1977, p. 444.
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23. E. J. Mishan, "Extending the Growth Debate," Prospects for Growth, K. D. Wilson, ed. (New York: Praeger) 1977, p. 286.
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25. Ibid., 1:42(a)-(o), pp. 14-18.
26. Ibid., 1:33(a), pp. 11-12.
27. Ibid., 1:31(a), pp. 8-9.
28. Hawaii Revised Statutes, Ch. 343-1.
29. C. W. Howe, Benefit-Cost Analysis for Water System Planning (Washington, D.C.: American Geophysical Union) 1971, p. 15.
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WATER RIGHTS IN HAWAII

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INTRODUCTION

It does seem a bit quaint in this age to be determining water rights on the basis of what land happened to be in taro cultivation in 1848. Surely any other system must be more sensible. Nevertheless, this is the law in Hawaii, and we are bound to follow it. We invite the legislature to conduct a thorough re-examination of the area. (McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 189 n. 15, 504 P.2d 1330, 1340 n. 15 (1973) (emphasis added).)

Water rights have long been a source of controversy in Hawaii, because the limited water resources of the islands have had to be divided up among competing users. The native Hawaiians developed a sophisticated irrigation system before Westerners arrived and allocated water according to the agricultural needs of the farmers and according to the amount of labor each farmer contributed toward building and maintaining the system of ditches or auwais. Frequently, water was rotated to different agricultural plots at different times of the day, so that all could share the limited resource.^{1/}

When Westerners came to Hawaii and saw the economic potential of sugar, the demand for water increased dramatically because of the enormous amount of water required to grow sugar. The Western entrepreneurs quickly acquired land in the rainy parts of the islands and constructed ditches for transporting water that were engineering marvels of their day. The sugar industry required this extensive irrigation system, and no major obstacles were put in the path of transporting the waters across the islands to the dry areas. Those persons who might have objected were either uncertain of the implications of these irrigation efforts or were powerless to act. Many viewed these water diversion projects as economically beneficial to the islands.

Subsequently, the wealth brought by the sugar crops gave persons with investments in sugar a major role in the politics of the islands. The power of the Hawaiian monarchy was first reduced in the 1880's; then in 1893 the monarchy was overthrown. Westerners first established their own government and then in 1898 annexed the islands to the United States, conveying to the United States the government and crown lands that had previously been controlled by the Hawaiian governments. One purpose behind this action was to ensure that sugar grown in Hawaii could be sold freely in the markets of the United States.^{2/}

After annexation, the Western oligarchy continued to dominate local politics in Hawaii until World War II. Many questions about water rights were still unsettled at the turn of the century, and the Hawaii Supreme Court was quickly faced with serious litigation on these issues.

Everyone agreed that persons who owned land that had received water under the traditional Hawaiian water distribution system in use prior to 1848 had a right to continue to receive water for their lands. This water right was called an "appurtenant" water right, because the right to use water was appurtenant to land that historically had used and needed the water.^{3/} The cases also occasionally referred to "riparian" water rights, which are the water rights of landowners whose land is adjacent to a running stream.^{4/}

Left unresolved, however, was the question of control over the rest of the stream water, which has become known as the "surplus" water. Although the native Hawaiians had occasionally transported waters through their auwais to dry areas, especially during years of heavy rainfall, they had not engaged in the massive irrigation projects required by the sugar industry. The Hawaiian approach to water use had been one of sharing the resource to promote agriculture. The sugar companies, however, demanded a secure supply of water and insisted on the right to control and own the waters that originated on lands they owned. The sugar companies also insisted on the right to transport water out of its original watershed area, even if such transportation greatly depleted the stream flow to the detriment of persons who owned the downstream land. Many of these diversions turned uninhabited and unproductive lands into flowing fields of sugarcane.

The Hawaii Supreme Court's responses to these claims were somewhat uncertain and inconsistent, but the three-member Court tended to uphold the position of the sugar companies.^{5/} Perhaps because of the importance of sugar to the islands' economy, the justices tended to permit private ownership of these "surplus" waters. The justices during this period were all Westerners, and the native Hawaiians had little opportunity to participate in these disputes. Even so, however, the cases are confused. The 1904 case ^{6/} first establishing private "ownership" over the "surplus" waters was not directly followed by the next case dealing with this question in 1917.^{7/} And the key 1930 case ^{8/} re-affirming private rights to the "surplus" waters was decided by a divided court with the three justices issuing three separate opinions. This 1930 case adjudicating rights in the "surface" or stream waters also seemed suspicious as an expression of neutral principles of law, because the principles it relied on differed so dramatically from those used just one year earlier in 1929 ^{9/} to adjudicate rights in the "groundwaters" of the state. The 1929 case involving the artesian well waters on Oahu adopted an approach of sharing this limited resource, an approach now called the "correlative rights" doctrine. The 1930 case permitted the upstream landowner to control the "surplus" water totally and to divert it without concern for the uses that downstream landowners and others might have had for this water.^{10/}

The next time the Hawaii Supreme Court looked at this question was in 1973 in the case of McBryde Sugar Co. v. Robinson.^{11/} During the years since 1930, the political make-up of the islands had changed, and the sugar industry's economic importance had declined. Many residents had rediscovered the native Hawaiian values of conservation, sharing,

and reverence for the land. The majority justices of the 1973 Hawaii Supreme Court saw a conflict between the traditional Hawaiian values and laws, on the one hand, and the Western approach which had guided the Hawaii Supreme Court in 1904 and 1930, on the other hand. They may also have been influenced by the approaches of other states to water rights, and they may have discovered that no other state in the United States appears to permit private ownership of water in the manner that the Hawaii Supreme Court had apparently approved.^{12/}

After considerable argumentation and a rehearing, the 1973 Court stated (with two of the five justices dissenting) that the Hawaiian monarchs had not intended to give away all water rights when the lands were distributed beginning in 1846, and that the stream waters belong to the State, subject to appurtenant and riparian rights.^{13/} They did not rule, however, that these waters could not be used by private parties. The court based its ruling on nineteenth century statutes and invited the Hawaii legislature to consider this question more fully.^{14/}

The private landowners viewed this ruling as a "taking" of their private property and turned to federal court for help. Although the U.S. Supreme Court declined to review the matter,^{15/} the U.S. District Court in Hawaii asserted jurisdiction over the dispute and ruled that the Hawaii Supreme Court's decision did deprive the landowners of property interests in the water.^{16/} This federal court ruling raises serious procedural questions which will be reviewed by the U.S. Court of Appeals for the Ninth Circuit.

Our analysis of these procedural questions leads us to conclude that the Hawaii Supreme Court decision should survive federal court scrutiny because this issue involves property laws which are traditionally interpreted by state courts rather than federal courts.^{17/} Even if the decision of the U.S. District Court should prevail, however, the water situation in Hawaii would still require legislative action, and we recommend several changes in our concluding section.^{18/}

The report that follows analyzes the changes in Hawaii's water laws during the past 200 years in the context of the changes that have occurred in the economy, political structure, demography, and social make-up of Hawaii. The report also includes a concise overview of the laws of other states, to help put Hawaii's situation in the proper context.

Many others have studied this problem, and its solution will require a consensus of agreement from Hawaii's many communities and interest groups. We feel that all parties to this dispute may have overstated the areas of their disagreement and that it may be possible to achieve a solution that is fair to all. We hope that this report will provide sufficient background to aid in the achievement of this consensus and that our recommendations will provide a beginning framework to enable the people of Hawaii to resolve their differences.

THE ANCIENT HAWAIIAN WATER SYSTEM

Introduction

Before the arrival of the Westerners to the Islands, the Hawaiians had a hierarchical society and a subsistence economy.^{19/} A carefully planned system of water rights supported this ancient society.

The Western conception of private property ownership did not apply to land in ancient Hawaii. Taro (kālo) was the staff of life for the ancient Hawaiian people, and its life and productivity depended primarily upon water. The right to use water was, therefore, probably more important than the right to use or possess land. The Hawaiian word for law, kanawai, originally referred to regulations concerning the water. This word choice illustrates the intimate relationship between the law and water during the ancient period.^{20/}

Moreover, water symbolized wealth to the Hawaiians because it was used to perpetuate the taro culture. The Hawaiian word waiwai means wealth, prosperity, ownership, possession. Translated literally, waiwai means water-water.^{21/}

The Tenure System

The idea of private ownership of land had no place in early Hawaiian thinking.^{22/} Some Western scholars and judges have, however, described Hawaiian land divisions as if the land had been personally "owned" in the Western sense. One leading scholar on Hawaiian water rights wrote, for instance, that:

Under the ancient Hawaiian system all land belonged to the king, the ruling chief. The sovereign allotted tracts of land from time to time to the principal chiefs, subject to revocation at will, retaining the remainder under his immediate control.

'Each principal chief divided his lands anew, and gave them out to an inferior order of chiefs, or persons of rank, by whom they were subdivided again and again, after passing through the hands of four, five or six persons, from the King down to the lowest class of tenants.'^{23/}

Ralph Kuykendall, professor of Hawaiian history, also stated that "the land belonged to the conquering king."^{24/}

These descriptions, however, oversimplify and distort the ancient Hawaiian system.^{25/} Under the ancient system, a high chief (alii nui or moi) controlled one island or a section of an island. For instance, the

great moi of Maui in historic times was Kahekili (said to have been the father of Kamehameha I). Kamehameha I also established his right to title as moi of the island of Hawaii when in 1805 he slew the alii nui of Kau, Keouakuahuula. In the fifteenth century, the great Umi ruled the whole island of Hawaii.^{26/}

Although larger divisions of land existed,^{27/} the basic landholding units were the ahupuaas. They ranged in size from 100 to 100,000 acres and normally had natural boundaries. Ideally, an ahupuaa extended from the mountains to the sea and was economically self-sufficient.^{28/}

At the top of the hierarchy, a chieftain (alii) controlled the ahupuaa through a supervisor, or land agent (konohiki). Because water rather than land was the primary consideration for the taro planters, the konohiki was normally responsible for the fair allotment of water. The control of the water by the land agent is discussed more fully in the next section.

The ahupuaas were generally divided into subdivisions called ilis. The chief or konohiki often designated an ili of an ahupuaa for his own convenience.^{29/} An ili was usually a long narrow strip of land running from the mountain to the sea through the ahupuaa.^{30/}

Upon granting an ahupuaa to a chief, the king would sometimes reserve a small tract of land or ili kupono (or simply ku) that stood independent of the ahupuaa within which it was situated. The king usually retained the ku for himself or gave it to a loyal follower. The residents of the ili kupono owed no tribute to the chief of the ahupuaa. In addition, the transfer of an ahupuaa did not necessarily include the ili kupono within its limits.^{31/}

At the lowest level, the maka'ainana (people of the land) mainly worked the land for the chiefs' personal benefit.^{32/} The commoners also had small tracts of land called moainas (later called kuleanas) for their own use and had gathering rights within the boundary of the ahupuaa.^{33/}

Within this hierarchy, the alii nui or high chief had a supreme role, but one that also had limits. The Hawaiian scholar David Malo wrote that "the king was over all the people; he was the supreme executive, so long, however, as he did right."^{34/} At the initial stages of becoming a ruler:

The [young prospect for king] had first to be subject to another chief, that he might be disciplined and have experience of poverty, hunger, want, and hardship, and by reflecting on these things learn to care for the people with gentleness and patience, with a feeling of sympathy for the common people, and at the same time to pay due respect to the ceremonies of religion and the worship of the god, to live temperately, not violating virgins, conducting the government kindly to all.

This is the way for a king to prolong his reign and cause his dynasty to be perpetuated, so that his government shall not be overthrown.35/

From a religious viewpoint, the ancient Hawaiians saw the alii nui as a person vested with divine powers and authority. This investment, however, provided "only a channeling of power and authority, not a vested right."36/ The alii nui was sacred (kapu) as though he was a god (akua). Nevertheless, his authority was not to exercise a personal dominion, but a channeled dominion (from the gods, Lono and Kane).37/ In other words, the alii nui was a trustee.38/

Further down in the political hierarchy, a chieftain or his land agent (konohiki) also had only a limited authority throughout the ahupuaa or ili kupono. Although the maka'ainana owed a work obligation to their superiors in the societal structure, the commoners were free to leave their ahupuaa if unhappy with their particular chief or konohiki and seek land elsewhere. In short, the maka'ainana were not bound to the land.39/ This situation apparently played a significant role in ameliorating abuses by the chiefs, who were anxious to keep sufficient work forces on their lands.40/ Should the high chief find that the konohiki had ill-treated the maka'ainana and caused them to move to another district, he would be inclined to remove the konohiki and place another person over the ahupuaa.41/

On the other hand, the konohiki would not have acted unreasonably if he had dispossessed a maka'ainana who had failed to render a plot productive. Under ancient customs, beneficial use of the land, as well as water, was essential for the continued use thereof.

This ancient land system was thus sharply different from Western ideas of private land ownership. The alii nui (or moi) himself enjoyed no absolute ownership of all the land. The alii nui was a trustee of all the people within an island (moku) or some other larger district. The konohiki also maintained a similar tentative position because the maka'ainana were free to leave the ahupuaa if they were unhappy with a particular chieftain (alii) or konohiki. In short, the members throughout the political hierarchy shared a mutual dependence in sustaining their subsistence way of life.

Ancient Hawaiian Water Rights

Agriculture in the ancient society existed as a highly organized and productive system. David Malo expressed the importance of agriculture in his manuscripts from the 1830's: "Agriculture was a matter of great importance in Hawaii, because by it a man obtained a means of supporting himself and his wife, his children, friends, and domestic animals."42/ Samuel Kamakau asserted that the "[Hawaiians] have been cultivators from very ancient times; it was by agriculture that they made a living for themselves, for their families, and for those dependent on them."43/ Paul Chun, in his study of Waihe'e Valley on windward Oahu, wrote of Hawaiian agriculture:

The highly advanced agricultural practices of the natives plus the rich valley bottoms and the adequate water supply provided an abundance of food for both commoners and chiefs. Boundaries were well established and the valley possessed almost all of the economic resources necessary for the natives.44/

Of the various agricultural products that the natives cultivated (which included sweet potatoes, yams, bananas, sugarcane, and bread-fruit), taro was the primary crop. The ancient Hawaiians farmed the taro on the flat lands near the sea, in the valley bottoms, and on terraced sections where water could be made available. None of the other products were cultivated as intensively as taro.45/ Superimposed on this agricultural preference of the ancient Hawaiians was a highly effective system of water rights.

The concept of inalienable title to water rights in relation to land did not exist in the ancient Hawaiian culture.46/ The ancient people believed that water, whether for irrigation, for drinking, or for other domestic purposes, "was something that 'belonged' to Kane-i-kawai-ala (Procreator-in-the-water-of-life) and came through the meteorological agency of Lono-makua the Rain-provider."47/ The Hawaiians further worshipped the alii nui (moi, high chief) as the descendant of Lono and Kane. As such, the alii nui was instrumental in bringing forth the rain and the flowing of water that gave life to the staff of life--taro. Hence, as mentioned earlier, the high chief held a channeled dominion from the gods and not a personal dominion over the water. The alii nui was the trustee in control of the water with the people as the beneficiaries. If the alii nui tried to assert personal dominion over the water, he risked being rejected or even killed by the people.48/

Water, like the air and sunlight as a source of life to the land and people, belonged to no person, not even the alii nui. The right to water depended solely upon the use of it. So long as the maka'ainana cultivated the land and contributed their share of labor to maintain the water system, the "right" of the maka'ainana to water would continue. The building and maintenance of the flood taro patches (lois) and of the irrigation ditches (auwais) were community projects.

On lands with a sufficient supply of running water, the natives built wet patches that were planted with taro. The farmers would first raise banks of earth about the patch. They would beat the banks hard and then let water into the patch. When the loi had become nearly dry, the laborers reinforced the four banks with stones, coconut leaves, and sugarcane tops, until they were water tight. The soil in the patch was then broken up, water let in again, and the earth was mixed and trampled with the feet. The trampling made the ground waterproof to stop the water from soaking entirely away.49/

The farmers often stretched lines to mark the rows in which the huli, or taro tops, were to be planted. The natives then kept water constantly running into the patches (except in times of shortages when

the water was rotated among the patches).^{50/} Although the taro may have attained full size earlier, it was usually not until after twelve months that the taro roots or tubers were ripe and ready to be made into food.^{51/}

The water that supplied these patches flowed through the auwai system. The ancient people frequently dug these ditches from the ocean upward to the mountains.

The dams (manos) in the ancient system were usually temporary low loose walls of stones. The natives made the dams high enough only to raise a sufficient amount of water to flow into the auwai. "No auwai was permitted to take more water than continued to flow in the stream below the dam. It was generally less, for there were those living makai or below the same stream, and drawing water from it, whose rights had to be regarded."^{52/}

The type of work that went into the lois, auwais, and manos could not have been done without the planning and direction of the chief (alii) of the ahupuaa or ili kupo. The chief, or his agent, the konohiki,^{53/} administered and distributed the water within the ahupuaa. The chief also granted homesites and taro patches, called kuleanas, to the maka'ainana. As mentioned earlier, the chief or konohiki could dispossess at his pleasure the commoners of their kuleanas and deprive them of their water privileges.^{54/} However, because the chief and commoners shared a common bond in the development of their subsistence economy, such dispossessions were rare and usually only for good cause. Working together, the ancient Hawaiians constructed an efficient irrigation system.

All the auwais (artificial ditches, watercourses) that tapped the main stream were under the authority of the konohiki of the ahupuaa or ili kupo. Whenever a single auwai served two or more ahupuaas, water was distributed in accordance with the number of persons who worked on its construction. The konohikis of the two or more independent lands usually united in the building of the auwai. The konohiki controlling the most men supervised the work and often became the water master of the canal.^{55/}

The number of laborers any land might furnish was not limited to any extent. It often occurred that more laborers represented a small ku or ili in the auwai-making than the laborers who represented the larger ahupuaa. Thus, the ku or ili would become entitled to as much or more water than the larger land.^{56/} The quantity of water awarded each kuleana was also according to the amount of work expended on the auwai and mano (dam) by the occupant of the kuleana.

The obligation of maintaining the ditches fell upon those whose lands received water. Should the maka'ainana fail to contribute their appropriate share of service, they would risk temporary suspension or entire deprivation of their water rights, or even total dispossession of their lands.^{57/} The maka'ainana who failed to render their plots productive also risked dispossession of their lands and water rights. A

type of beneficial use of water by the maka'ainana apparently was essential for the continued delivery of water under the ancient code.^{58/}

The methods of distribution differed at different times and at different places. One common method of distribution was on the basis of time. The time flow varied among the various land units (i.e., kuleanas, ilis, kus, and ahupuaas) from a few hours to as much as three days. The konohiki regulated the divisions of the day by the position of sun and the stars. The konohiki of each independent land unit subdivided the water time among the tenants. Again, the amount of work the commoners expended on the water system determined the quantity of water to which they were entitled.^{59/} In the case of large neighboring lands, the water master allotted water at night to one land and during the day to the other. This rotation continued until all subdivisions of each neighboring tract received their water. The water master then exchanged the night and day use between the tracts.^{60/} Some patches were supplied by overflow and seepage from higher lands and not necessarily from any watercourse.^{61/} Still another method apparently occurred under conditions of abundant water supply and limited demand. The operator of an upper patch received as much water as needed without any reference to time. When the operator of this upper patch was satisfied, the next lower patch received water in the same manner. This procedure continued until all the areas along the auwai had been supplied. The process was then repeated.^{62/}

One writer in the 1930's, H. A. Wadsworth, noted the many parallels between the ancient Hawaiian approach and the water allocation schemes in use in most Western states under the "appropriation" system (which is explained in detail below at pages 222-26):

Beneficial use of water in the hands of the commoners was essential to continued delivery under the early Hawaiian code as it is among western states operating under the doctrine of appropriation. Compulsory maintenance work on the auwais under the direction of the konohiki, with the threat of refusing delivery, with possible dispossession, is at least analogous to maintenance assessments or water tolls in modern irrigation development, while the powers of the konohiki in rationing water during periods of scarcity are parallel to those of water masters on some important streams in western America. Furthermore, the delivery of water upon the basis of labor contributed in the construction of the auwai is suggestive of the distribution of modern costs upon the basis of benefits received, a method frequently used in drainage ventures.^{63/}

Little has been written about the use of "surplus" waters (waters beyond that required for the irrigation of taro) among the ancient Hawaiians. One writer on ancient Hawaiian water rights has said that

when the summer brought plentiful rainfall, surplus water was sometimes diverted to dry kula lands and a second crop of potatoes planted. Waters were never diverted, however, if any taro patches still needed water.^{64/} Wadsworth attributed the lack of attention given to the surplus water to the technical difficulties that limited early irrigation:

Since water in Hawaiian streams was usually sufficient for the irrigation of valley and flood-plain lands in taro, even at low-river stage, the surplus waters find scant notice in the early water code. The heavy construction required for the utilization of these waters upon nearby slopes was beyond the engineering resources of the time, resourceful as the natives may have been. Apparently such water was allowed to follow its natural course to the sea.^{65/}

An opinion rendered by the Hawaii Supreme Court in 1904 did assert (without citation) that all waters originally belonged to the King and that no limitation existed to his power to use the "surplus waters" as he saw fit.^{66/} The Hawaiians probably did not view this matter in that way. Because such waters generally followed their natural course to the sea, the question of who had the power to control the waters was irrelevant. The 1904 opinion, furthermore, ignored the basic custom of cooperation and mutual dependence that existed among the ancient Hawaiians in maintaining their subsistence culture.^{67/}

In any event, disputes concerning water were extremely rare among the ancient Hawaiian people.^{68/} The Hawaiians accepted the water as sacred, and no believing Hawaiian would tamper with that which was identified with Kane, the source of life.^{69/}

The ancient people took much care not to pollute the streams. The Hawaiians bathed ('au'au) low down in the stream. The washing of utensils and calabashes took place farther upstream. Still farther upstream were the dams for the auwais. And finally the natives took drinking water from a place above the dams.^{70/}

Conclusion

Perhaps the essential feature of the ancient water system was that water was guaranteed to those persons who needed it, provided they helped in the construction of the irrigation system. Because agriculture was a matter of great importance to the Hawaiians, they were, in general, willing to contribute their efforts to the water system. The konohikis aimed to secure equal rights for all the maka'ainana and to avoid disputes. Beneficial use of water by the maka'ainana was also essential to the continued delivery of the water. The natives were subject to compulsory maintenance work on the auwais under the supervision of the konohiki. The konohiki, on the other hand, was reluctant

to impose unreasonable burdens on the tenants because they were normally free to leave the particular plot if unhappy with the konohiki. Hence, a "spirit of mutual dependence and helpfulness prevailed, alike among the high and the low, with respect to the use of the water."^{71/}

HOW ECONOMIC, SOCIAL, AND POLITICAL CHANGES AFFECTED WATER RIGHTS

Introduction

Water rights in Hawaii are historically related to the lands adjoining the water. As land became consolidated into the hands of a few wealthy owners, so too were water rights claimed. Therefore, it is necessary to understand the history of land acquisition and ownership patterns in Hawaii to understand how water rights came to be controlled in the hands of a few.

As the previous section indicates, land in ancient Hawaii was controlled by the central chief who held it as trustee for the gods and people and who shared it with lower chiefs and commoners for their mutual benefit. Even though the maka'ainana were in a sense merely tenants on the king's land, they did possess rights. "Thus possession of allotted land, though basically temporary and insecure even during the life of the holder, carried with it water rights, fishing rights, and the right to use forest products."^{72/} Although a tenant could be dispossessed without cause by the king or a chief of higher status, such dispossessions were probably infrequent. "The tenants as a rule did not migrate and lived on the same lands for generations. The fact that the landlord was dependent on them for service both in peace and war tended to render their tenure more stable."^{73/}

The boundaries and names of various landholdings were maintained by oral tradition and passed from generation to generation through specific persons selected as repositories of this information. Boundaries were identified by geographical features: streams, ridges, hills, or other prominent features.^{74/}

The question of land ownership became complicated as more and more foreigners settled in Hawaii. Foreigners pressured the king to grant fee simple ownership of land, thereby securing their capital investments, and "foreigners were aided in some cases by diplomatic agents of the governments to which they owed allegiance . . ."^{75/} The missionaries, intent on improving the welfare of common people, also influenced the king's thinking on tenure patterns.

The first effort to adapt land patterns in Hawaii to Western perspectives occurred in 1825 when Kamehameha III acceded to the throne.

The council of chiefs approved a formal policy, later characterized as the Law of 1825, that permitted the hereditary succession of lands at the death of their occupants. Kalanimoku, the guardian of the young king, had ridiculed the reversion of lands to the king upon the death of the occupants. The guardian instead proposed the system of hereditary succession, an objective of Kamehameha I.^{76/} In short, the Law of 1825 formalized the law of inheritance that Kamehameha I had recognized.

The next changes came with the Bill of Rights in 1839 and the Constitution of 1840. The Bill of Rights "declared, among other things, that the chiefs and the people were entitled to the same protection under the same law; that all persons should be secured protection in their lands, building lots, and all property; and that nothing should be taken from any individual except by express provision of law."^{77/} The following year, the Constitution formally declared that the land belonged to all, with the king named as trustee for the people:

Kamehameha I, was the founder of the kingdom, and to him belonged all the land . . . though it was not his own private property. It belonged to the chiefs and people in common, of whom Kamehameha I was the head, and he had management of the landed property.^{78/}

These provisions codified ideas that Hawaiians were familiar with. Arbitrary evictions and seizures of lands occupied by native tenants were outlawed, and the trust relationships among the king, the chiefs, and the people were explicitly declared.

In order to limit the Westerners' claims to land, the 1840 Constitution further expressed that the king could lose no land without his consent.^{79/} Foreigners disliked this latter provision because it reaffirmed the general rule that no one, native or foreigner, could convey lands without authorization by the king.

The Westerners did receive some benefits from the 1840 Constitution, however, giving them a foothold on the island lands. Fearing a confrontation with the Westerners, the king also provided in the Constitution that he would refrain from reclaiming any property already held by Westerners.^{80/}

The Mahele Period (1845-1855)

By 1845 the land tenure system would no longer accommodate itself to the wishes of the Westerners. R. C. Wiley published his notes in the Friend that advocated a "liberal policy in order to encourage industry, awaken the energies of the people, and develop the agricultural resources of the country."^{81/} Another instance occurred when several British subjects alleged interference with their long held lands.^{82/}

Consequently, the government presented the legal foundation for a system of private ownership in real property. The legislative council in 1845 adopted the "Law Creating the Board of Commissioners to Quiet Land Titles."^{83/} Dr. Gerrit P. Judd, as Minister of the Interior, had initiated the creation of this Board or Land Commission.^{84/} The Land Commission Act established a five-member board:

. . . for the investigation and final ascertainment or rejection of all claims of private individuals, whether natives or foreigners, to any landed property acquired anterior to the passage of this Act; the awards of which board, unless appealed from as hereinafter allowed, shall be binding upon the Minister of the Interior and upon the applicant.^{85/}

The Minister of the Interior issued patents or leases to the claimants of land after the Board had confirmed their respective claims.^{86/} The Minister, in concurrence with the Privy Council, also issued patents in fee simple upon payment of commutation.^{87/} One must note that the Land Commission could not divide the lands or change the tenures by which the lands were held. The Commission was not empowered to grant patents. It only decided whether claims submitted were valid.

The Land Commission initially lacked guidelines to reorganize the intertwined land tenure system among the king, chiefs, and commoners. The board therefore adopted a set of principles in 1846 ^{88/} to "guide its work with land still under the traditional system."^{89/} The Western-dominated Commission ^{90/} projected its goal to be a "total defeudalization and partition of undivided interests."^{91/} The Principles essentially discussed a fair and equitable division of land between the king, chiefs, and tenants:

If the King be disposed voluntarily to yield to the tenant a portion of what practice has given to himself, he most assuredly has a right to do it; and should the King allow to the landlord one third, to the tenant one third and retain one third himself, he, according to the uniform opinion of the witnesses, would injure no one unless himself; . . . According to this principle, a tract of land now in the hands of a landlord and occupied by tenants, if all parts of it were equally valuable, might be divided into the three equal parts. . . .^{92/}

For two years the king and chiefs debated over the division of land. The chiefs on the Privy Council initially were reluctant to adopt the Principles concerning the division of land without knowing what lands the king intended to take for his own.^{93/} Finally, on December 18, 1847, the Privy Council adopted these Principles ^{94/} and the

following year they set in motion the division of land now known as the Great Mahele.

The "Principle" quoted above at footnote 92 seemed to envision a division of the lands into three categories: the King's lands, the chiefs' lands, and the lands of the maka'ainana or commoners. The mechanics of the Mahele were more complicated, however, and ultimately the maka'ainana did not receive their share. For 41 days in early 1848, King Kamehameha III signed agreements with the 251 major chiefs to divide the lands of the islands between the King and the chiefs. The day after these divisions were completed, March 8, 1848, the King divided his lands into two parts--crown lands and government lands.^{95/}

The land of the commoners was held in trust by the King and the chiefs, and it was not originally clear what the commoners needed to do to obtain their land. Many of the commoners were, of course, unaware that they needed to do anything to obtain their lands, because they had always had access to whatever lands they needed.

In 1850, a statute was enacted to clarify this problem. This statute, formally called the "Enactment of Further Principles," but more commonly referred to as the Kuleana Act, provided for commoners' claims to land which they lived on and cultivated. Most of those eligible to claim land did not, however, do so. Estimates of those who actually claimed and were awarded land range from 8,205 to 11,132 persons.^{96/}

Numerous reasons help explain why the maka'ainana did not secure more kuleana grants. Most people believed they were protected from dispossession by the Constitution, so many owners saw no need to apply for the patents which secured their claim. Many people did not understand the concept of fee simple ownership, so they remained unconcerned with the patent.^{97/} In addition, many Hawaiians were being attracted to the cities and to an easier life-style than taro cultivation. Fewer people had an interest in farming as a livelihood.^{98/}

Perhaps most important were the diseases that were ravaging the Hawaiian people. Four devastating epidemics occurred in rapid succession in 1848 and 1849. Low Hawaiian resistance to measles, whooping cough, diarrhea, and influenza resulted in appalling mortality levels.^{99/} By 1878, a century after Captain Cook arrived, the Hawaiian population had gone from an estimated 300,000 to 50,000.^{100/}

The end result was that kuleana grants amounted to less than 1% of the total land area of the Kingdom. Table 1 below indicates the amounts awarded each of the groups.

A second major piece of land legislation was passed in 1850. The Penal Code and Laws of 1850 gave foreigners the right to acquire freehold land. A foreigner could also dispose of the same to any resident of the Kingdom, whether native or foreigner.^{102/}

TABLE 1--Approximate Division of Lands, 1848 to 1855 ^{101/}
(Acres)

Category	Acres
Total area of kingdom ^{a/}	4,010,000
Crown lands (as of 1893) ^{a/}	915,000
Government lands (as of 1848)	1,495,000
Land sales (or grants) to June 8, 1893	667,317.4
Held by government as of 1893	828,000
Chiefs' lands ^{a/}	1,571,341.6
Bishop Estate (as of 1893)	420,000
Other chiefs' lands, surveyed before 1855	133,012.6
Other chiefs' lands, not surveyed before 1855	1,018,329
Kuleanas ^{b/}	28,658.5

^{a/} Variant estimates appear in Report of the Governor . . . 1901, p. 7: total area, 4,126,000 acres; crown lands, 984,000 acres; chiefs' lands, 1,619,000 acres.

^{b/} Land Commission awards to the common people, including a few lots awarded to foreigners (mostly in Honolulu). These were generally either house lots or small pieces of cultivated land. The number of Land Commission awards was 11,309, including 177 to chiefs or konohikis; for the remaining 11,132 kuleanas, the average award was 2.57 acres.

Source: 53d Congress, 2d Session, House of Representatives, Ex. Doc. No. 47, President's Message Relating to the Hawaiian Islands. December 18, 1893 (Government Printing Office, 1893), pp. 639-641.

The Penal Code of 1850 completed the basic transition of the Hawaiian tenure system to a system of private ownership of land. The Great Mahele of 1848 and the Kuleana Act of 1850 had concerned mainly native Hawaiians. The Penal Code finally allowed aliens to enjoy the same rights as the Hawaiians in the ownership and use of land.

Subsequent large sales of land by chiefs and the government, through the Minister of the Interior and the Land Commission, transferred much of the land to the wealthy and non-indigenous population. The government did not do much to help the common people acquire land after 1855. Sanford B. Dole, President of the Hawaiian Republic between 1893 and 1898 and subsequently the first territorial governor of the islands, explained this phenomenon as follows:

Afterwards [after the Mahele] the Government drifted away from this liberal attitude toward the people [granting common people the opportunity to obtain title] and for a long time its land policy was of a character most unfavorable to the development of a prosperous rural population. Large areas of arable and grazing land were leased for long terms or sold outright for cash. The crown lands being inalienable were leased in large areas for long terms. The rich easily obtained the control of extensive tracts while it was a difficult and discouraging enterprise for the poor man to secure the few acres that he needed for a home and for cultivation.103/

This story is thus a sad one from the perspective of the native Hawaiian people, because it is the story of how they lost their lands. Whether they intended to transfer their water along with their land is, however, less clear. Certainly, one can point to efforts on the part of Kamehameha III to preserve his authority over water and to retain his sovereign rights as trustee for the people to ensure their overall well-being. Significantly, the King emphasized in the Laws of 1842 his continued authority to allocate the rights to water. The Law stated:

In all places which are watered by irrigation, those farms which have not formerly received a division of water, shall . . . be supplied in accordance with this law, the design of which is to correct in full all those abuses which men have introduced. All those farms which were formerly denied a division of the water, shall receive their equal proportion. Those bounties which God has provided for the several places should be equally distributed, in order that there may be an equal distribution of happiness among all those who labor in those places. The allowance of water shall be in proportion to the amount of taxes paid by the several lands.104/

This language seems to indicate that Kamehameha III intended to preserve the power to regulate water for the common good. The land would be divided into private parcels, but the king would retain control of the water for the purpose of ensuring that it was divided equitably among those who used the water and contributed beneficially to the community's economy. This formula was consistent with the earlier Hawaiian approaches to water distribution.

Another example of the King's concern for his sovereign powers over the waters occurs in the Principles adopted by the Land Commission in 1846. One of these Principles stated that the King was authorized to dispose of his proprietary rights in the lands, but not his "sovereign prerogatives as head of the nation"--which include his duties as trustee to promote the beneficial uses of the land: "To encourage and even to enforce the usufruct of lands for the common good. . . . These prerogatives, powers and duties, His Majesty ought not, and ergo, he cannot, surrender."105/ The majority justices in the 1973 McBryde decision viewed water as one of the most important usufructs of land, and thus decided that the King intended to maintain his sovereign dominion over the fresh waters of the Kingdom.106/

The 1850 Kuleana Act, or Enactment of Further Principles, also contains language concerning the water rights of the common people against the landlords (konohikis) who had taken allodial titles to their lands (ahupuaas and ili kuponos). The statute stated:

The people also shall have a right to drinking and running water, and the right of way. The springs of water, and running water, and roads shall be free to all, should they need them, on all lands granted in fee simple: Provided, that this shall not be applicable to wells and watercourses which individuals have made for their own use.107/

The McBryde majority interpreted this part of the provision as guaranteeing riparian rights in the surface waters of the islands:

. . . the term "running water" must mean water flowing in natural watercourses, such as streams and rivers. We also believe that the right to "running water" as contained therein guarantees a land owner the same flow of water in a stream or river as at the time of the Mahele, without substantial diminution, or the right to flow of a stream in the form and size given it by nature. This right may be in connection with his right of laundering, canoeing, swimming, bathing, etc.108/

The dissenting justices, however, disagreed with this interpretation.109/

Although the statutes seem to have tried to distinguish between water rights and land ownership, that distinction was lost in the case law prior to the 1973 McBryde decision. In the 123 years between the Kuleana Act and the McBryde interpretation, private landholders had increasingly claimed the surface waters as their own and had exercised control over these waters.

The Rise of Sugar and the Transfer of Land to Private Hands

The Land Commission, charged with granting awards based upon Mahele divisions, finished its labors and was dissolved in March of 1855. All unadjudicated claims became the responsibility of the Minister of the Interior, as did the sale or lease of all government lands. By the Act of January, 1865, all crown lands were made inalienable and could not be sold. This same act, initiated at the time of Kamehameha V, took administration of these lands away from the monarch and placed it in the hands of a newly created Board of Commissioners of Crown Lands.^{110/} By 1865, the ownership of all lands rested predominately in three places: (1) the large tracts awarded chiefs during the Mahele; (2) the vast amounts of government lands under the administration of the Minister of the Interior; and (3) the remaining crown lands under the administration of the Commissioners of Crown Lands. The king had no administrative control over the disposition of land.

At this point, the sugar industry began playing a prominent role in the life of the islands. Twelve sugar plantations were operating here in 1860, but by 1866 the number jumped to 32.^{111/} The Civil War made sugar production so profitable that Hawaiian growers could afford the high U.S. tariffs. However, it was the Reciprocity Treaty, negotiated with the United States in 1876, which removed the tariffs and made sugar production in Hawaii very profitable.

As Table 2 below indicates, sugar became Hawaii's big business and growth in the industry over time is apparent.

TABLE 2--Capital Invested in Sugar Production ^{112/}

1867 to 1929

Year	Million \$
1867	2
1880	9
1892	32
1900	85
1929	150-175

Sugarcane production required large-scale plantation operations and tremendous amounts of capital. Both requirements contributed to an aggregation or consolidation of land and consequently power in the hands of a few wealthy and influential Western entrepreneurs. As technological innovations made the sugar market more competitive, independent growers were forced to sell out to the large-scale sugar corporations.

The corporations, factors, or fiscal agents, operated by providing needed capital to the plantations and eventually expanded their services to include exporting products and importing commodities and labor. The factors had the financial stability to weather price fluctuations that the independent growers lacked. The result was a consolidation of independent sugar operations into large factor-operated plantations. In 1885, 90 plantations were in operation. Five years later, the total acreage in cane production had increased greatly but the number of plantations dropped to 60.^{113/}

The factors, known as the Big Five, included the companies of Alexander and Baldwin, American Factors, C. Brewer, Castle and Cooke, and T. H. Davies. By 1933, the Big Five controlled 96% of the sugar crop and most of the banking, insurance, railroads, utilities, merchandising, and shipping concerns in Hawaii.^{114/} They also acquired enormous parcels of land through purchase or lease and exercised control over much of the surface waters on the islands.

After the Land Commission expired in 1855, the Minister of the Interior was empowered to sell building lots and tracts of land of all sizes, at prices ranging from twenty-five cents to one dollar an acre.^{115/} A new Land Commission took over the duties of the Minister of the Interior in 1900 and, like the Minister of the Interior, could lease as well as sell government lands. Both administrators of public land had a strong predisposition to lease large amounts of land to the sugar companies, because the return on the lease revenue was far more profitable than if the land was used for small-scale farming or homesteading. "A special effort has been made by the Land Commissioners Office in renewing cane land leases, to the end that the Territory share in the profits derived from the leased areas."^{116/} Frequently, leases negotiated with sugar companies based the amount of rental on the price of sugar.^{117/} The Territory benefited when the industry prospered, and sugar interests were not unduly harmed when the price of sugar fell, for so did their rental with the government.

Much of the land that had been transferred to the chiefs after the Mahele quickly moved into the hands of the Western sugar interests. The great majority of the Hawaiian upper class was heavily in debt by the 1840's. The sandalwood was gone and local commerce was in the hands of foreigners. The land was the only thing left of value. One commentator has explained the Mahele along these lines: "One of the main reasons for instituting the Great Mahele was to provide the chiefs with an alternative source of income."^{118/}

The chiefs were eager in most cases to sell their entire Mahele award to another single landowner. These practices kept ownership of land consolidated while transferring control of it out of the hands of the native population. The result of this predisposition toward large landowners was that after the Mahele, in 1890, 3 out of 4 landowners were Hawaiian, but 3 out of every 4 acres belonging to private owners were held by Westerners.^{119/}

The process of consolidation continued, so that by 1909 five-sixths of all the land in Hawaii was controlled by Western interests.^{120/} By 1967 Hawaii's 72 largest landowners in combination with the state and federal governments owned 95.36% of the total land area. All other private owners taken together hold less than 5% of the land in Hawaii.^{121/}

Some persons who held positions as Minister of the Interior or as a Commissioner of Crown Lands were decidedly inclined toward sugar interests. (See Appendix I for listing of office holders.) Many of the ministers and commissioners between 1875 and 1893 had an active role in the overthrow of the monarchy.

Record keeping by the Minister of the Interior was poor and lacking in specificity, and it is probable that the Ministers may not have always had the public interest at heart during certain sales. One early example involves sales of land to Gerrit Judd who held positions in the 1840's and 1850's as Secretary of Foreign Affairs, Minister of the Interior, and Minister of Finance in the Kingdom. According to one writer, Judd's ". . . purchases and grants of land were immense, and, it is a matter of record, in the Government House, that he purchased at one time 17,000 acres of land for 50 cents."^{122/}

Examination of the records of government land sales from 1886 to 1888 reveals other large-scale land sales for what does not seem to be a great deal of money.

TABLE 3--Selected Government Land Sales, 1886-1888

	Purchaser	Island	Size	Price
Patent No. 3416	Trustees of B. P. Bishop Estate	Hawaii	2,200 acres	\$250.00 (\$.11/acre)
Patent No. 3396 3397	Kalama K. Kumuloa	Hawaii	5,500 acres	\$100.00 (\$.02/acre)
Patent No. 3409 3410 3414	Samuel Parker	Hawaii	72 acres	\$1,104.00 (\$15.33/acre)

The exact location of these lands has much to do with their proper value. Unfortunately, the records are not specific enough to compare them further. A complete listing of government land sales for 1886-1888 is presented in Appendix II. However, it is clear that the government sold great amounts of land at very "reasonable" prices, which seem far below the comparable figures for private sales during this period. In 1886 James Campbell offered Honouliuli lands on Oahu (suitable for sugar, rice, and fruit production) for from \$100 to \$200 per acre for the best land, while grazing land was offered for \$25 an acre.^{123/}

Creation of the offices of Minister of the Interior and the Commission of Crown Lands was originally a response to the general lack of understanding of land values on the part of the king. For example, in 1855 Kamehameha IV granted the entire ahupuaa of Waihe'e on Oahu to Ben Parker for \$48,000.^{124/} Yet the Ministers of the Interior themselves encouraged land sales which placed a great deal of land in the hands of a few people (conducive to sugar operations) and consequently left most common people without the opportunity to own land.

The common people who were able to secure their kuleana grants also saw much of their land fall into the hands of large landowners for two reasons: (1) the changes in the economy and the nature of sugarcane operations, and (2) their lack of understanding of the new Western legal and institutional system. The inauguration of the sugar industry and commercial activities in the cities afforded the maka'ainana employment opportunities, a certain income, and an easier life-style than the kuleana. Often the kuleana was deserted or leased to neighboring sugar plantations.

Once having passed into the possession of the plantation, whether by lease or purchase the bounds and identity of the Kuleana were gone. The boundary hedges, or fences, were cut down, the Ku-aunas or dykes, were levelled off, the ditches were filled up, the fruit trees sacrificed and when the middle-aged owner came back from Honolulu to see the place which was dear to him from childhood, he simply couldn't find it!^{125/}

It was a lengthy and cumbersome process for the owner of a kuleana to regain it after it had been leased to a sugar company. More often than not, after a small payment from the plantation, he did not want it back. Eventually many kuleanas came to be owned by neighboring sugar plantations.

The Water Commission

What became of the rights to water during these periods? The sugar industry increasingly sought access to additional water sources. Because sugar appeared at the time to be the most viable economic base for the islands, the Hawaiian governments tended to support the needs of

the sugar industry. Some observers have interpreted the government action as acknowledging the private ownership of the "surplus" waters. Federal Judge Martin Pence, for instance, wrote in 1977 that:

For a period in excess of seventy-five years, the several governments of Hawaii have executed the laws of the Kingdom, the Territory and the State of Hawaii in a manner which has been guided by court decisions on the question of surplus water, which expressly or implicitly acknowledged the title to surplus water rests in the owner of the ahupuaa or ili kupono (konohiki) in which it originates. . . .^{126/}

An equally reasonable interpretation of these governmental actions, however, would be that they were attempts to maximize beneficial use of the water by allowing the sugar industry access to the water, but that they did not imply that the sugar companies "owned" the surplus water. Although water rights were taxed by the government at different periods,^{127/} no konohiki was ever given any specific title to the surplus waters by any governmental agency. The claim to title to these waters is thus based solely on 20th century cases that are discussed below at pages 185-91.

In 1860 the legislature created a Commission of Private Ways and Water Rights to settle the inevitable controversies over the use of water. The duty of the commission was to settle all controversies respecting water rights between individuals and between individuals and government. In 1888 the commission was reduced to a single member with the right to Supreme Court appeal. In 1907 the office of commissioner was abolished and its duties were transferred to the circuit court judges.^{128/}

An examination of commission records ^{129/} reveals that the earliest commission hearings involved only oral testimony. No written documents, such as deeds or titles to land or water, were presented. In each dispute testimony concerning customary water uses was taken from numerous persons who had resided in the area and were familiar with the dispute. The length of residence is important, for it is given in the testimony of each witness and in every dispute. This oral or "kamaaina" testimony was given great weight by law, for long term residence reflected better knowledge of customary water rights.^{130/}

In these early disputes the commission did not define ownership per se, but rather determined the duration and time of day in which each of the claimants could divert the stream onto their fields. In fact, the "water right" meant the right to divert and use water for a specified time.

The commissioners apparently did not establish specific principles to determine water rights. Instead they attempted to adjudicate the dispute based on historical usage and maximizing beneficial uses. The

records often do not specifically acknowledge whether appurtenant, prescriptive, or riparian rights were in dispute, although appurtenant and prescriptive rights were recognized.

The commission records are confusing because they lack the complete details of each dispute, but the following general observations are possible:

1. The commissioners recognized other rights to stream water than ancient appurtenant rights and for other purposes than taro cultivation. This distribution of rights may have been based on the principle of maximizing use. The commissioners recognized the principle of water rights in proportion to land based on the tax law of 1842.^{131/} "They [the commissioners] further decree that the water shall be divided among these lands in quantities proportionate to the acreage"^{132/}
2. The government was treated as any other landowner in water rights disputes.
3. Private citizens could acquire prescriptive water rights.
4. All new diversions of stream flow were only possible after satisfying appurtenant rights.
5. Appurtenant taro rights were preserved against all other claims and could not be lost by disuse.

No case was discovered that specifically involved the control or ownership of surplus water or the transfer of large amounts of water out of its original watershed area. It is questionable if a statutory basis for this control ever existed. But the government's apparent acquiescence to private control was a necessary condition for the growth of the sugar industry. "A large part of modern [sugar industry] development has been made by securing such rights [to surplus water] by purchase of the ahupuaa and the subsequent transfer of available water to areas which in early days had never been irrigated."^{133/}

As large landowners purchased entire ahupuaas suitable for growing sugarcane, but only if vast portions of neighboring streams could be diverted for irrigation, it became in the government's economic interest to recognize private control.

On September 25, 1876, King Kalakaua signed a legislative act creating a commission to report on lands suitable for the growing of sugarcane and on the cost of water, harbor, and other improvements necessary to develop suitable lands. The Minister of Finance was authorized to issue bonds to finance necessary improvements and to make government water and land available for new enterprises "without compensation to the government."^{134/} The Minister of the Interior was also authorized to apportion the government water to the various interested landowners. Finally, in the same 1876 legislative session, an act, signed September 18, provided the means by which persons having water

rights distant from land proposed to be developed could acquire necessary rights of way across intervening land owned by others.^{135/} Hawaii's water resources were thus made freely available to the sugar industry, which developed the resource.

The Irrigation Ditches on the Four Larger Islands

Introduction.

The ancient Hawaiian ditches diverting streams for irrigation purposes were short and of small capacity.^{136/} But as land tenure patterns shifted to large-scale private holdings and the economy turned to plantation sugar production, the method of diversion and amount of water taken from streams changed radically.

Owners of ahupuaas (which by the 1880's were frequently Westerners) with large unirrigated acreage suitable for sugar production claimed and diverted waters from neighboring streams, making many of these lands productive for the first time. A second method used to acquire water when no neighboring streams were available was to obtain a water license from the kingdom to collect and transport waters.

The kingdom had a strong economic interest in assisting sugar companies in many of these operations. Some members of the Hawaiian royalty viewed the development of the sugar industry as a means of helping the economy of their people. In addition, some members of the royalty were personally indebted to Western sugar producers and often granted favorable leases of land and water as a method of keeping their creditors happy.^{137/} Many of the early leases between the kingdom and the irrigation developers based the price of water on the price of sugar. A good sugar crop would mean extra revenue for the kingdom.

The diversion of waters to sugar lands sometimes created a hardship on downstream water users, but because of the government's economic alliance with sugar growers, the interests of these small farmers tended to be ignored. The profitability of the sugar industry depended on the ability to transport and use water cheaply; and the government assisted these efforts with some enthusiasm. The first of these projects was the Hamakua Ditch on Maui.

Hamakua Ditch on East Maui.

In 1876, Samuel Alexander and Henry Baldwin obtained a lease from the Hawaiian government to construct an aqueduct and collect the waters of East Maui. The kingdom apparently granted this water license because the government could not afford to finance the project itself.^{138/} The project captured mountain water from Nahiku on East Maui along the coast to Honopou and transported it to the dry lands of Central Maui. Before the project was built, waters from these East Maui streams generally flowed back into the sea. Alexander and Baldwin estimated the ditch would take a year to build at a cost of \$25,000, but the ditch actually required \$80,000 and two years to complete.^{139/} Had the ditch

not been completed within two years, all construction would have reverted to King Kalakaua who had a secondary agreement with Claus Spreckels for completion of the ditch should Alexander and Baldwin fail and thus forfeit.

Alexander and Baldwin worked strenuously and creatively with the help of imported laborers to complete this engineering feat within the time limit. The finished product was 17 miles long with a capacity of 60 million gallons per day, supplying the Haiku, Paia, Kaliahinui, Puulehu, and Kula plantations, which used water in proportion to their share in the cost of construction.^{140/}

Other ditches were added to the system as Central Maui's sugarcane development demands expanded - the Haiku, Spreckels, Center, Manuel Luis, and Lowrie ditches before the turn of the century; the New Hamakua, Kauhikoa, and Koolau ditches before World War I; and the last major construction, the Wailoa ditch, completed in 1923.^{141/} Each of these new ditches either paralleled or extended the Hamakua ditch, moving water from East to Central Maui for cane irrigation.

By 1948 Hawaiian Commercial and Sugar Company had incorporated all the surrounding plantations, becoming the sole user of water supplied by the East Maui Irrigation System (EMI). Today the East Maui Irrigation Company, a wholly owned subsidiary of Alexander and Baldwin, Inc., operates a vast waterworks system incorporating 75 miles of ditches and tunnels, reservoirs, and numerous other support facilities. The system, with a delivery capacity of 455 million gallons a day, would cost over \$100 million to construct today.^{142/}

The licenses and leases between the government and EMI are renegotiated in four separate agreements for four geographic zones. Each lease lasts for 20 years, but each of the four leases begins and ends at a different year, and so they are not renegotiated together. The Honomanu license is computed upon the basis of an assumed average annual yield of 5,300 million gallons at \$2.92 per million gallons; Huelo assumes an annual yield of 14,060 million gallons at \$3.50 per million gallons; Nahiku assumes a yield of 7,143 million gallons at \$1.26 per million gallons; and Keanae assumes 18,296 million gallons at \$1.95 per million gallons.^{143/}

For these amounts, EMI is entitled to divert by means of aqueducts government-owned surface water from all streams in the license area. EMI is also entitled to develop groundwater sources within the license area. The variations in the amounts charged for water in the four zones result from a complex computation regarding the quantity of water taken under various conditions.^{144/} Although previous leases had also varied the price of water according to fluctuations in the price of sugar,^{145/} in recent years the amount charged for water has been negotiated at a fixed rate.

Dividing EMI System into four separate lease agreements--each of which expires in different years--seems to provide an inherent advantage for EMI. The staggered leases have made it all but impossible for any

competitive users to bid at public auction for parts of the EMI license. In addition, the value of each piece of the system separately is far less than its value as part of the system as a whole. These two factors have almost guaranteed EMI use of the system at a cost far below actual value. To correct these unbalances, the Department of Land and Natural Resources (DLNR) plans to renegotiate each lease so they all will terminate at a common point in the future. This change would allow DLNR to negotiate a lease with EMI, or with a competing bidder, that would recognize the full value of the water.146/

One problem that remains, however, is that under the East Maui Water Agreement of 1938, the Territory of Hawaii granted EMI a perpetual easement through government land in the license area for the collection and transmission works in return for use of the works between Nahiku and Honopou.147/ This agreement also seems to make it impossible for anyone but EMI to bid for the license. Consequently, EMI has obtained the license in the past for \$10.00, plus the cost of the sale or public auction, amounting to less than \$200.00.148/

Beginning in 1961, the County of Maui, needing water for economic development and growth, requested a re-evaluation of the state's agreements with EMI. Of particular concern to Maui County is the legality of the State granting easements and rights in perpetuity that have prevented Maui from bidding for the water it needs. The county's perspective was stated in 1961:

There is adequate water for all concerned, however, no one party should control its sale or usage as to be detrimental to others. The County being a subdivision of the State should have as much rights to the usage of State water as the present licensee.149/

EMI's monopoly of East Maui water continues to place a heavy financial burden on Maui County. In 1961, the Honomanu license between the State and EMI was due for renegotiation. Maui County requested that the State grant the license to the county, enabling the county to purchase water directly from the State instead of through the EMI "middle-man." The cost savings for Maui County would have been significant:

The water sales revenue from this area amounts to only \$9,000 yearly for the state as compared with the cost to the County of \$7,400 for only 11% of the volume.150/

The county's plea was rejected, however, and the Honomanu license was once again renegotiated between the State and EMI. The county and EMI then entered into a Master Water Agreement in December, 1961, for 24 years. This Agreement states that rates can be renegotiated every five years, but shall not be less than rates for the preceding period.151/

EMI's monopoly allows it to purchase water cheaply from the State and forces the county to repurchase the water from EMI to provide water for public purposes on Maui. The difference between what EMI pays for

water and what it charges for water is great. Under the Honomanu license, the State of Hawaii is selling water to EMI at a rate of approximately \$2.90 per million gallons. After transporting the water out of the watershed area, EMI sells it to the Maui County Water Department at a rate of \$10.00 per million gallons.152/

Samuel Alexander and Henry Baldwin's construction of the Hamakua Ditch, ancestor to the East Maui Irrigation System, turned hundreds of barren acres in Central Maui into productive sugarcane land. Yet today, the monopoly of water controlled by EMI raises questions that need resolution.

Hanapepe River on Kauai.

Three major landowners now divide the land adjoining the Hanapepe River--Gay & Robinson Co., McBryde Sugar Co. (a subsidiary of Alexander and Baldwin), and the State of Hawaii. These three parties have been fighting since 1918 over control of the waters in this area. (See pages 187-91 and 194-99, below.)

The six major geographical areas of importance in the Hanapepe region are the ahupuaas of Makaweli and Hanapepe and the four major ilis kupono in the ahupuaa of Hanapepe--Koula, Manuahi, Eleele, and Kuiloa.

Mrs. Elizabeth Sinclair purchased the ahupuaa of Makaweli and the ili of Koula in 1865. In 1878, she also acquired the ili of Manuahi. Mrs. Sinclair's son-in-law Francis Gay formed the partnership of Gay & Robinson in 1888 and made plans for a sugar plantation. The crown retained the ahupuaa of Hanapepe and today the State of Hawaii owns this area. The McBryde Sugar Company purchased the ilis of Kuiloa and Eleele in 1915 and 1884, respectively.153/ The ilis of Manuahi and Koula, which contain the principle sources of the Hanapepe River, have been used by Gay & Robinson to secure water rights for sugar activities in the arid ahupuaa of Makaweli.154/

Henry Baldwin organized the Hawaiian Sugar Company in 1889 and after securing a lease from Gay & Robinson for lands in Makaweli began sugarcane production there. As in Maui, Baldwin was responsible for the first major diversion of water in Kauai from the Hanapepe River to the cane lands in Makaweli. The ditch, constructed in 1891-1892, was capable of delivering 60 million gallons of water a day. Its 13 1/2-mile length consisted of tunnels, open ditches, flumes, and siphons. The reported cost was \$152,000.155/

The Hanapepe Ditch was difficult to maintain and was finally abandoned in 1948, when the new Koula Tunnel was completed. This tunnel diverts water directly from the Koula Stream tributary, before it reaches the Hanapepe River, keeping the tunnel entirely within Gay & Robinson's Manuahi and Makaweli land.156/

The only other major ditch in the area is the McBryde Intake Ditch or Pumpditch which diverts water from the Hanapepe River at an elevation of 50 feet for use by the McBryde Sugar Company. The water is mixed

with well water and pumped to cane fields in the eastern portion of the Hanapepe Valley.^{157/}

The Hanapepe River once flowed to the sea with a great volume of water and supported a large indigenous population in the Hanapepe Valley. The large-scale diversion of water to irrigate kula sugarcane lands has significantly affected the flow of the river. In some years, the mouth of the river is almost dry for many months.^{158/} The ecological equilibrium of the Hanapepe Valley has been significantly upset by these major diversions.

Water diversions in the Hanapepe area illustrate how large landholders acquired lands for the purpose of sugarcane production on the assumption that by the purchase of the land they also acquired rights to excess waters. At the time of these early purchases and diversions, however, no statutes or judicial precedents provided a secure basis for this assumption.

Kohala Ditch on the Island of Hawaii.

On June 11, 1906, Samuel Parker opened the Kohala Ditch to provide water to the thousands of empty acres of land at the north end of the Big Island. The ditch has its origin at the Honokane Stream 1,030 feet high in the Kohala Mountains.^{159/} This system is fairly unique in Hawaii because it is comprised predominately of tunnels and only the last few miles are really ditches. When completed, the ditch accommodated 70 million gallons per day.^{160/}

The ditch provided water for over 13,000 acres of existing sugarcane lands and increased the productivity of this region from 2 to 4 tons per acre. In addition, the project allowed the cultivation of over 10,000 additional acres that would have remained idle without water. Construction costs amounted to \$600,000.^{161/} A contemporary author described this project as "a clear development in the savings of waters which were going to waste in the ocean."^{162/}

The Kohala Ditch Co., Ltd., was organized in 1904 to develop and furnish these waters for domestic and agricultural purposes in Kohala. The Kohala Ditch Company is currently owned by the Kohala Corporation, a subsidiary of Castle and Cooke, Inc.^{163/} The company acquired its rights to the water from two sources. The first involved a water license from the Territory of Hawaii in 1904 for a period of 50 years to "enter upon, confine, conserve, collect, impound and divert all the running natural surface water on that portion of the island of Hawaii . . ."^{164/} In addition the company negotiated certain other leases from the trustees of the Bishop Estate.^{165/} One of the conditions of the water lease with the Territory required the company to provide domestic water for use in the Kohala area "and deliver water to all consumers for any purpose at reasonable rates."^{166/}

In 1921, the Public Utilities Commission determined that the Kohala Ditch Company was a public utility subject to the control of the PUC. "Kohala Ditch Company is a public utility as to all water furnished and

supplied by it and . . . as such a public utility its rates are subject to the control of the Commission as to its entire water supply and so we hold."^{167/} After that ruling, however, most of the Kohala Ditch Company water continued to be sold to Kohala Sugar Plantation, its parent, for irrigation purposes. A very small proportion has been sold to the County of Hawaii for domestic purposes.^{168/} After the shutdown of the Kohala Sugar Plantation, the major users of the water became Hawaii Biogenics (for feedlots and corn irrigation), Kohala Nursery, and Pacific Hay (for cattle feed production). Their combined consumption ranges from 6 to 10 million gallons per day.^{169/}

Waiahole Tunnel on Oahu.

Oahu Sugar Company, located on the leeward coast of Oahu, began operations in 1896, initially using water pumped from wells for irrigation purposes. The cost of pumping water to lands at higher elevations limited the plantation's operations to lands below 650 feet above sea level.^{170/} For many years, however, the idea of transporting water from the rainswept slopes of the windward side of the island to these potentially productive but arid lands in Central Oahu was toyed with by various interests in Oahu. Many reports on the feasibility of the project determined that such an undertaking was possible but costly. The original estimate was \$1,500,000.^{171/}

The demand for water was so great that in 1912 the Waiahole Water Company was formed to combine the water sources of the Waiahole, Waikane, and Kahana Streams into a single aqueduct for transport to the leeward plain through the Koolau Mountains. Most of the work done by the company in 1912 involved acquiring water rights from the government and other small landowners to take the water from the valleys, as well as securing easements and access routes.^{172/} From its various leases, the Waiahole Water Company claimed title to the konohiki rights to water. The Waiahole Water Company also took advantage of government policies that provided private security for water development by offering access to public land and water. A listing of Waiahole Water Company's private and public water licenses is presented in Table 4.

The Waiahole system consists of a number of connecting tunnels on the windward side, which divert surface water from the many streams on the slopes of the Koolau Range, and four development tunnels from which groundwater is obtained. The main trans-mountain tunnel serves both as an interceptor of dyke water and a conveyance tunnel to transport the water from the windward to leeward side. A series of ditches on the leeward side then conveys water to the reservoirs and ditches of Oahu Sugar Company. The original length of the system from Kahana Valley to the terminal reservoir in Honouliuli was approximately 21.9 miles. The ditch system has been expanded westward an additional 3.4 miles in recent years.^{173/}

The system was an engineering and technological marvel in its day, and problems involved in its construction were of no small scale. Yet, the tunnel provided a boon to Oahu Sugar Company that none of the early engineering reports had anticipated.

TABLE 4--Waiahole Water Company Water Licenses

Area	Lessor	Lease Period	Rental Price
1. Kahana	Kahana Hui	5/27/16-5/26/66 [acquired 12/21/12]	\$40,000 a year
		Included right of way for facilities for the length of the lease.	
	--development tunnel	4/15/29-5/26/66	\$6.00 per mg
2. Waikane	McCandless	12/30/12-now [acquired 12/30/12]	---
		Included permanent right of way for facilities and water rights.	
3. Waiahole (General Lease 810)	Territory	5/27/16-5/26/46 [acquired 12/12/12]	\$15,000 a year
		Included permanent right of way for facilities.	
	--first extension	5/27/46-5/26/56	Water up to 3 mgd \$8 per mg From 3-5 mgd \$6 per mg Over 5 mgd \$2 per mg Pump water \$1 per mg
		--second extension denied but water still being used.	
4. Kahana and Waiahole (General Lease 4329)	State	1/1/71-12/31/2000 [acquired 12/30/70]	-For first 15 years: Fixed min. rent \$32,600/mg Camp site \$1,000/mg Aqueduct system \$10,000/mg First 2160 mg/yr. \$10/mg Over 2160 mg/yr. \$8/mg Pump water \$1.50/mg

TABLE 4--Continued

Area	Lessor	Lease Period	Rental Price
			-For remaining 15 years: All above at reappraised price not less than the first 15 years
5. Waiawa	Bishop Estate	5/27/16-5/26/66 [acquired 1/1/13]	\$5.14 per mg with \$22,500/yr. minimum
		Included a permanent right of way for facilities.	
	--revised	7/1/23-3/1/57	\$8.50 per mg with \$16,000/yr. minimum
	--renewed	4/1/57-3/31/79	First 1825 mg/yr. \$12/mg Over 1825 mg/yr. \$6/mg Ahrens ditch water \$6/mg with \$24,000/yr. minimum

Source: Karen Yamashita (Department of Agricultural Economics, University of Hawaii), Native Hawaiian Water Rights: The Integration of Laws and Economics 25 (May, 1977).

Work on the project began from both sides of the Koolau Mountains in early 1913. While tunneling in from the south (leeward) side, the drillers tapped unexpected dyke water held in the volcanic formations of the mountains. These waters were fed into the discharging ditches, providing Oahu Sugar Company with water sooner and in greater amounts than expected.^{174/} This dyke water percolated down from the publicly-owned watershed areas of the Koolau Range; the rights to these waters were never formally purchased by the Ditch Company. Approximately 17 million gallons per day began flowing to fields on the leeward coast before the tunnel was even completed.

Dyke water was also encountered by the drillers entering from the north and this slowed construction considerably. When the two sides of the tunnel met in December, 1815, 80% of the length of the tunnel was driven from the south entrance. The final cost of construction was \$2,000,000, not including the cost of water rights.^{175/}

The diversion of the three major windward streams seriously affected lower-level stream flow but the issue of depleted flow was not seriously raised in the early 1900's. Today the lost stream flow on the windward side is taking on greater importance to residents of those valleys who find that the low stream flow places severe constraints on the possibility of developing small diversified agricultural operations. The key issues center around whether all the water rights acquired by Waiahole Water Company are legitimate and whether such water rights can be severed from the land and transferred from the watershed. Another important issue is the amount of water taken from the stream. The Waiahole tunnel system has seriously affected the flow of the Waiahole, Waikane, and Kahana Streams because most of the water is diverted above the 800-foot level. A 1969 study of the water resources of Windward Oahu stated that the Waiahole Ditch tunnel system caused two Waiahole Valley springs to dry up, resulting in a loss of a substantial amount of water.^{176/}

Conclusion.

All of the ditches examined in these case studies have diverted great quantities of water to irrigate sugarcane lands that would have remained unproductive without the water. That the Territory and State of Hawaii benefited by the prosperity of the sugar industry, made possible by such diversions, is unquestioned. However, recent changes in the economy and growth in the population have caused observers to ask whether the interests of the people of Hawaii in common are currently properly protected in the management and allocation of this natural resource.

Overthrow and Annexation

The economic impact of the sugar industry played a role in changing the political control of Hawaii, as well. James Blount, a special federal investigator sent to Hawaii in 1893 by President Cleveland to research the causes of the overthrow earlier that year reported:

The undoubted sentiment of the (Hawaiian) people is for the Queen, against the Provisional Government and against annexation. A majority of the whites, especially Americans, are for annexation.

* * *

The controlling element in the white population is connected with the sugar industry.

* * *

The repeal of the duty on sugar in the McKinley Act (a reversal of the Reciprocity Treaty in 1890) was regarded as a severe blow to their interests . . . Annexation has for its charm the complete abolition of all duties on their exports to the U.S.^{177/}

Sugar was the hub of the Hawaiian economy in 1900 and "at the top of (the) power structure were the men who ran the great sugar agencies."^{178/} The cohesiveness of this oligarchy kept sugar interests and government interests compatible:

At nearly all times during the period (1900 through 1940) of elite rule, the governor and a substantial number of legislators were men who had held administrative or policy positions in the major sugar agencies or their subsidiaries.^{179/}

Every governor appointed to the Territory was Republican and as historian Gavin Daws says, "was beholden in some way or other to one or another of the Big Five, and the agencies were well represented on governmental boards that dealt with tax appraisals, land leases, and other items of interest."^{180/} This oligarchy of business and government constituted only 5% of Hawaii's population, yet its control of social, economic, and political events in Hawaii was unchallenged until after World War II.

After annexation, the new government adopted the Western land registration system to secure land titles. Thus, 1904 marked the final major transition in landholding patterns in Hawaii with the introduction of the Torrens Land Registration System. From the time of the Mahele through the early 1900's, land titles were in a very confused state. Deeds were missing, boundaries lost, surveying was inaccurate, and kuleana holders continued to die in disproportionate numbers.^{181/} In addition, Hawaiian children frequently did not take their parents' name or used multiple names in business matters. Land transactions were bogged down by the problems of establishing certain ownership, making it almost impossible to buy land safely.^{182/}

Investments were hampered by the lack of security in the titles. The Torrens System and the land court were established to settle all claims or titles to property for all time. Claims were brought before the court where controversies were adjudicated and uncontested claims taken as confessed. A registered title was issued to the successful applicant. Once registered, no one else could challenge the title: "title (is) good against the world even if the register is incorrect."183/

The use of the Torrens System effectively shut out many Hawaiian kuleana claimants.184/ To file a Torrens claim required the services of an attorney, an abstractor, and a surveyor. Preparation of some claims cost \$2,000. But the more devastating effect for small Hawaiian landholders was that unchallenged claims were taken as confessed or valid. Appeals of a land court decision were not permitted.

Although all claims were required to be published in a newspaper of general circulation for three consecutive weeks, in the early 1900's the newspapers only reached outlying rural areas once a month.185/ In addition, "only a few could read well enough to understand legal verbiage."186/ Many rural Hawaiians lost their land because they were unaware of a challenge to the title they assumed was secure.

THE DECISIONS OF THE HAWAII SUPREME COURT ON WATER RIGHTS 187/

Introduction

The Hawaii Supreme Court stated in 1930 that "our system of water rights is based upon and is the outgrowth of ancient Hawaiian customs and the methods of Hawaiians in dealing with the subject of water."188/ The justices of the Hawaii Supreme Court--who until recently were all Westerners--have, however, disagreed over the years on how Hawaiian customs should apply to modern water disputes. Numerous Hawaii Supreme Court decisions have asserted that the king in ancient Hawaii owned all the land and water and could do with either or both as he pleased.189/ Yet most Hawaiian scholars have found that in ancient Hawaii the water, like the air and sunlight, belonged to no one, not even the ruler.190/ This disagreement affects many of the cases that will be examined in this section.

The case law in Hawaii has historically made a distinction between surface waters flowing in streams, on the one hand, and groundwaters which percolate from artesian wells, on the other hand. Most water engineers find this distinction odd, because both waters are part of the same overall ecosystem.191/ Yet the major 1929 case on groundwaters 192/ made this distinction apparently because the ancient Hawaiians did not utilize well drilling as a source of water, the surface waters being sufficient for their subsistence economy.193/ The 1929 supreme court

presumed that Hawaiian customs and methods in dealing with water were not applicable to the use of groundwater and adopted the doctrine of correlative rights for these waters.194/

In fact, however, although the doctrine of correlative rights originated from Western jurisprudence, its several principles are similar to ancient Hawaiian customs concerning water. A fundamental conception that water may be taken only after considering its impact on other water users underlies both the doctrine of correlative rights and the ancient Hawaiian customs regarding water.

In contrast, the doctrine that emerged for surface waters--which permitted the landowner owning the highest parcel to claim all the "surplus waters" without regard for the downstream impact of such a claim 195/--seems to be opposed to the Hawaiian approach of sharing, even though the court purported to be applying Hawaiian concepts.196/

The full examination of these cases that follows tries to explain the jurisprudence of the Hawaii Supreme Court on water in the context of the economic, social, and political conditions of the times.

"Appurtenant" Water Rights

The ancient Hawaiians diverted water from natural streams for domestic and agricultural use by means of artificial ditches or auwais. The konohikis ensured the continued delivery of water to taro lands for the services that the commoners had contributed to the building of the water system. The konohikis, as well as their tenants, shared an interest in the continued cultivation of the lands. When waters flowed normally, the konohiki distributed the water to subunits of taro patches as an established procedure, and the food that was produced was then shared with the konohiki and other chiefs.197/

The ancient ditches connected with the streams "became a permanent feature of the topography of the localities where they were constructed."198/ The water that usually flowed through the system attached as a custom to the irrigated tract, even though the konohiki could still, for cause, revoke such customary right.199/ This ancient use of water evolved into a "legal appurtenance, or easement, or incident to the land" during the land reform period of the 1840's. The use of water on a tract at the time title was obtained, though not an actual ancient use, also became the basis of a valid water right. These rights are included in the term "appurtenant rights."200/

The justices of the Hawaiian Supreme Court interchangeably used the term "prescriptive rights" and "appurtenant rights" in their early decisions concerning water rights. Prescriptive rights, which are examined in the next subsection, are rights acquired by a person without actual title who has used the water against the wishes of the actual owner for the statutory period of time. The konohikis, prior to the 1840's, gave the tenants rights to use specific quantities of water

based on their labor in helping to construct the irrigation ditches. The tenants' use of water was not adverse to the konohikis. The tenants, therefore, did not acquire prescriptive rights in the technical sense of the term. The Western judges in the late nineteenth century nonetheless characterized the right to water by virtue of being appurtenant to a stream or ditch as a prescriptive right.^{201/}

Chief Justice Allen, in the first reported water rights case of Peck v. Bailey ^{202/} in 1867, stated:

By the deed, the water courses were conveyed and a right to the water accustomed to flow in them. The same principle applies to all the lands conveyed by the King, or awarded by the Land Commission. If any of the lands were entitled to water by immemorial usage, this right was included in the conveyance as an appurtenance.^{203/}

According to Peck v. Bailey, the taro lands conveyed by the King or awarded by the Land Commission thus carried with them the appurtenant rights to water sufficient for taro growing.^{204/} Appurtenant water rights in Hawaii are frequently referred to as taro water rights.

On the question whether appurtenant waters could be transferred to kula lands (uncultivated arid lands), the Peck court held that the defendant had the right to use the taro water on other lands if no injury was done to others. The court limited the quantity of water that could be transferred to kula land to that amount the defendant was entitled to on his taro lands by immemorial usage.^{205/}

A later case ruled that the discontinuance of irrigating lands that were entitled to appurtenant water rights did not amount to an abandonment of those rights. Justice Antonio Perry, in Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co. (1904),^{206/} stated this principle as follows:

It does not necessarily follow from the discontinuance of irrigation of land to which water rights are appurtenant that the right to the water is abandoned. It may be and often is the fact that the discontinuance is merely for the purpose of using the water on other lands.^{207/}

As had the Peck court, Perry condoned the transfer of appurtenant waters to kula lands within the same ahupuaa (of Wailuku). The question whether appurtenant waters can be transferred to lands outside the Wailuku ahupuaa was not addressed in these cases.

Although Peck v. Bailey confirmed the transferability of appurtenant waters, the fact that the transfer imposed no injury on other parties might limit the court's holding to similar situations without

resulting injury. The Peck court's view allowing transfer of "appurtenant" waters departs from the basic meaning of the word--something that belongs to, is an accessory or incident to a principal ^{208/--} without a complete justification for this departure.

Prescriptive Rights to Water by Adverse Usage

Although the terms are sometimes used interchangeably, "prescriptive" rights differ fundamentally from "appurtenant" water rights (which are the ancient taro rights). "Prescriptive" rights are those obtained adversely from a previous owner, through "actual, open, notorious, continuous, and hostile use" of the water for the statutory period of time.^{209/} Appurtenant water rights have been based upon a use that was permissive at its inception and later ripened into a legal appurtenance. This ancient right has no element of hostility because the konohiki originally gave permission for the use of water.^{210/}

Uses of the Term as Connoting Ancient Appurtenant Water Rights.

In several of the early water rights cases, the term "prescriptive" implied ancient appurtenant rights as well as rights obtained by adverse use.

In dealing with appurtenant rights, the opinion in Peck v. Bailey (1867) indiscriminately refers to such rights as vested by prescription and vested by immemorial use. Chief Justice Allen asserted "that the complainants were entitled to all the water rights which the lands had by prescription at the date of their title."^{211/} In the same context, Allen said, "If any of the lands were entitled to water by immemorial usage, this right was included in the conveyance as an appurtenance."^{212/}

More confusion over "prescriptive" rights emerged in Lonoaea v. Wailuku Sugar Co. (1895).^{213/} The opinion of Chief Justice Judd discussed only prescriptive rights although both appurtenant and prescriptive rights were involved in the case. The plaintiff, one of a number of taro growers in Wailuku, alleged that the Wailuku Sugar Company, the defendant corporation, took more water than its share from the Wailuku River. The defendant claimed prescriptive rights to the whole flow of Kalauiawai, Kamauiawai, and the mill stream from 4 o'clock a.m. to 4 o'clock p.m. of each day from Monday to Saturday, and on Sunday the right to run the water into its reservoirs from 4 o'clock a.m. to 10 o'clock a.m.

Historical evidence showed that Wailuku was once thickly settled; over 400 kuleanas were granted to natives and others.^{214/} Kalauiawai and Kamauiawai supplied most of the water to these kuleanas. Kamehameha III cultivated cane on a small scale in the ahupuaa in the early 1850's. In subsequent years, two sugar mills were constructed in Wailuku, which combined with several independent planters to become one corporation, the Wailuku Sugar Company.

The cane growers apparently had irrigated their fields by day for thirty years or so because of the inconvenience of watering cane at night. The taro growers--who had appurtenant rights--took water by day and night. In times of drought, the cane lands drew the water exclusively by day and the taro growers diverted water at night. When the scarcity of water had passed, the taro growers again took water by day and by night. This system continued to the date of the case.

The court found sufficient evidence to sustain the view that the Wailuku Sugar Company had prescriptive rights to all the water by day as against the majority of the taro growers.^{215/} This result seems surprising because it was unclear how "hostile" the sugar company's use actually was. (See the next subsection, below.) The result also seems contrary to the holding in the later 1904 case of Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co. ^{216/} which held that appurtenant taro water rights cannot be lost by abandonment or disuse.^{217/}

In spite of the distinctions between the concepts "appurtenant water rights" and "prescriptive rights," the early Hawaiian decisions tended to use the two terms interchangeably. This behavior by the early courts illustrates the difficulty of transforming the ancient Hawaiian water code into Western legal principles.

The Courts Outline Prescriptive Rights in the Technical Sense.

The principles that govern the acquisition of properties by adverse possession (actual, open, notorious, continuous, hostile, and exclusive use) also govern prescriptive acquisition of water rights. Actual, open, and notorious uses have always been essential elements in obtaining a prescriptive right to use water. The adverse party must use water in the manner that would give notice of such adverse use to the actual owner or party who has the right to use said water.^{218/}

Another essential element has been the continous use of water for the statutory period of time.^{219/} The first statute in Hawaii authorizing claims by prescription or adverse possession was enacted in 1870, establishing 20 years as the statutory period over which the adverse use must continue.^{220/} Interestingly, this statute was passed exactly 20 years after foreigners were permitted to purchase private property.

In 1898, after Westerners had solidified their control over the lands and had taken over political power as well, they lowered the statutory period to ten years,^{221/} thus further accelerating the movement of lands into Western control. The most recent statutory period has been twenty years,^{222/} but a 1978 amendment to the Hawaii Constitution ^{223/} imposes limits on all claims of prescriptive rights.

Lonoaea v. Wailuku Sugar Co. (1895) ^{224/} was described in the subsection above as a case where the court confused the terms prescriptive and appurtenant rights. The court may also have misapplied principles normally governing prescriptive rights, because the "hostility"

of the use by the sugar company remained unclear. Hostile use has been a fundamental prerequisite for the adverse use against the holder of a legal claim. In other words, the adverse party must claim the use of water as his or hers by right.

Lonoaea ruled that a change in the use of water was adverse because of the fact that the changed use was "enforced."^{225/} The taro growers originally had rights to the water in the Wailuku River by day and night. With the advent of large-scale sugar growing in the district, the Wailuku Sugar Company began using the water by day while the taro growers used it by night. Although the taro growers acquiesced in this system, the court still ruled the use by day adverse.

To be hostile, a use must deprive the legal owner of water to which he or she is entitled or, as in Lonoaea, compel the owner to change the accustomed manner of usage. In short, the rightful owner must be injured.

The element of exclusiveness has not frequently appeared in litigation that has reached the Hawaii Supreme Court. This element is so closely related to the element of hostility that exclusiveness is included therein.^{226/}

Hawaii has recognized the general law that the statute of limitations does not run against the State.^{227/} If the State should acquire rights to certain waters, according to the general law, no private party would be able to obtain prescriptive rights to those waters. The question whether prescriptive rights already vested in private parties would revert to the State remains to be resolved.

The Evolution of Riparian Rights

The Riparian Doctrine.

The word "riparian" comes from the Latin word "ripa" which means bank.^{228/} A general understanding of the doctrine has been that:

. . . owners of lands adjacent to a natural stream are entitled to correlative rights in the water of that stream,--that each is entitled to a reasonable use of those waters and to so use them that other owners on the banks of the same stream may have a like reasonable use of the same waters, unaffected in quality and undiminished in quantity except in so far as made necessary by the reasonable use of others above.^{229/}

In other words, the riparian rights under common law have depended upon the fact that the land is on the bank of a natural watercourse. It has been a right to use first for domestic reasons, and then second for

"artificial" purposes. The latter purposes have included mining, mechanical uses, and irrigation. The use must be reasonable and correlative for the artificial purposes. As for domestic purposes, or "the drinking purposes of men and animals,"230/ all the water in the stream may be taken if necessary.231/

The riparian owner must return all unused water diverted from the stream. He does not own the water, but merely has a usufruct 232/ while it passes his property. The owner of the riparian land cannot transfer the water from the land, for use on nonriparian land. Should he sell part of his property that does not abut the stream, such conveyed land would not carry any riparian right to water.233/

These principles of riparian rights evolved from the English rule of natural flow. Under the strict English rule, each riparian landowner had a right to have the water flow past his or her lands undiminished in quantity and unimpaired in quality. This strict interpretation of the rule has proved to be almost completely unworkable, because it deprives every riparian proprietor of applying the water to domestic, agricultural, and manufacturing purposes.234/

The riparian doctrine was adopted in many jurisdictions in the United States, but they have modified the common law in two ways. First, damages have become essential to maintain an action against a user of the stream. Second, use of the water on non-riparian land is permitted, subject to the criterion of "reasonableness."235/ The main factors that caused these changes in the common law include the rapid industrialization of the Eastern states and the mass migration of people to the West. In short, water became too precious to permit the English rule of natural flow that allowed water to be wasted.236/

The doctrine of "correlative rights," which is applied to groundwater (or specifically, artesian waters) in Hawaii 237/ is similar to the riparian doctrine in certain respects. The correlative doctrine permits a landowner above an artesian basin to draw a reasonable share of the water therefrom so long as he does not injure the rights of others to the water.238/ This groundwater principle does not specifically categorize the use of water between domestic use and artificial use as does the riparian law. The correlative principle suggests, however, that under certain circumstances larger uses, such as for industrial purposes, might not be permitted.239/ This suggestion perhaps would mean that domestic purposes would receive higher priority than industrial uses in times of scarcity. Moreover, in times of threatened deterioration in the quality of the groundwater, the correlative rule would require all landowners above the artesian basin to conduct themselves so as not to take more than their reasonable share.240/ Because the riparian owner merely has a usufruct to the surface water-course, the riparian use of the water also must not alter the substance or quality of the stream.

One of the appeals of the riparian doctrine is thus that it is similar to the correlative principle in certain significant respects.

It would seem logical for these two doctrines to co-exist in a water system comprised of surface and groundwaters that come from the same sources and service the same population. The Hawaii Supreme Court, prior to 1973, did not follow this approach. (Pages 191-94, below, deal specifically with the correlative rights doctrine.)

Judicial References to the Riparian Principle.

In three cases between 1867 and 1917, the Hawaii Supreme Court apparently assumed that riparian rights existed in Hawaii. In the Peck v. Bailey (1867) decision, Chief Justice Allen discussed riparian rights in some detail in spite of the fact that the "principles which govern them have very little practical application to this case."241/ Allen stated that all riparian proprietors are "subject to the rights of others enjoyed by prescription. . . . So if a riparian proprietor should interfere with an ancient auwai, by which other lands had been watered from time immemorial, he would be liable in damages. . . ."242/ In short, appurtenant taro water rights are paramount over riparian rights. Allen also mentioned that the rights of irrigation, watering cattle, and using water domestically were incident to the estate adjacent to a natural flow, "provided [the adjacent landowner] does not materially diminish the supply of water or render useless its application by others."243/

The king's conveyance of the land in the ahupuaa of Wailuku would normally include those auwais used from time immemorial. The Peck court, in dicta, also states that the king's "conveyance of land bordering on the Wailuku River will include the rights of water in said river, which had not been before granted."244/ Moreover, the court recognized that the kula lands, or lands not bordering on the river, had no riparian rights.245/

The Peck court did not specifically describe the type of water governed by riparian law. The language outlined above strongly indicates, however, that the common law rule would apply to those waters in the natural streams that are not claimed by ancient appurtenant rights.

The Hawaii Supreme Court in Davis v. Afong (1884) 246/ included a holding implicitly based upon the riparian doctrine.247/ It was not until Carter v. Territory in 1917,248/ however, that the Hawaii Supreme Court finally explicitly adjudicated a dispute involving the riparian doctrine and based its decision on that doctrine. The Waikoloa Stream in the Carter case originated on the ahupuaa of Waimea in the district of South Kohala, on the island of Hawaii. The Territory owned the ahupuaa of Waimea. The stream also flowed partly onto the ahupuaa of Ouli, land owned by the petitioner who was a private owner.249/

Chief Justice Robertson's opinion for the court gives no extended discussion of the riparian doctrine. He does not refer to previous Hawaiian decisions that apparently acknowledged the riparian principle. The Chief Justice does, however, state that: "Private water rights in

this Territory are governed by the principles of the common law of England except so far as they have been modified by or are inconsistent with Hawaiian statutes, custom or judicial precedent."^{250/} The riparian doctrine was considered to be part of the common law of England at that time. At one point in the opinion, the court mentions that the right to ancient ditches for domestic and irrigation purposes "passed with the conveyance of the land as an incident, like a riparian right at common law, though it was by public grant."^{251/} The Carter court also states that:

While the Territory is the riparian proprietor both above and below the points at which water is diverted to the lands of the petitioner it is obvious that the diversion by it of water to sell to the homesteaders is not the exercise of its riparian right. Such use, though a highly beneficial one, is a new and different use which could not be exercised to the detriment of the pre-existing vested rights of others.^{252/}

The above passage suggests that the Carter court felt bound by the rule that riparian waters shall not be transported to non-riparian lands if such a transfer injures other users.

Finally, after disposing of the many other questions raised by this case, the court addressed the issue concerning the petitioner's "right to storm or freshet waters of the Waikoloa Stream on the ahupuaa of Ouli."^{253/} The court phrased this issue as follows: "The question here presented, as to the rights in the surplus waters of a stream which flows from one ahupuaa into another, is one of first impression."^{254/}

The court's answer came from principles applicable to the riparian doctrine:

That is to say, each ahupuaa is entitled to a reasonable use of such water, first, for domestic use upon the upper ahupuaa, then for the like use upon the lower ahupuaa, and, lastly, for artificial purposes upon each ahupuaa, the upper having the right to use the surplus flow without diminishing it to such an extent as to deprive the lower of its just proportion under existing circumstances.^{255/}

The common law rule permitted an upper riparian owner to use the entire stream if necessary for "natural" or "ordinary" uses--i.e., domestic, household, and watering of domestic animals, and probably irrigation of family gardens.^{256/} A modified version of the rule entitled each riparian proprietor to a reasonable use of the water for "artificial" purposes--such as large scale irrigation--but only if such use did not injure other lower proprietors.^{257/} In short, artificial uses have been considered inferior to domestic uses at common law. Carter seems to have adhered to this distinction by stating that both

ahupuaas have rights to use the waters for domestic purposes before either can use it for artificial purposes. Carter does not, however, grant the upper ahupuaa the privilege, which appears to have existed at common law, of exhausting, if necessary, the supply for domestic purposes. The court thus seems to be fashioning a correlative rights approach to these waters, requiring a sharing of the resource, along the lines followed by the native Hawaiians.

The 1917 Carter case was the first reported Hawaii Supreme Court case specifically adjudicating riparian rights. The court focused on riparian rights with respect to storm and freshet surplus waters of the Waikoloa Stream as it flowed from the ahupuaa of Waimea, owned by the government, and the ahupuaa of Ouli, owned by the petitioner. The 1930 case of Territory v. Gay ^{258/} restricted Carter by finding that it had not adjudicated riparian rights with respect to the normal surplus flow of the stream.

Rights to "Surplus Waters"

Although rights to "surplus waters" would seem to be related to riparian rights, an adequate discussion of the subject requires a separate section because the 1930 decision of Territory v. Gay ^{259/} treated such waters as a special category. The use of surplus water apparently was not unknown to the ancient Hawaiians. When the rains were plentiful, providing substantial water during the summer months, the Hawaiians transferred the surplus waters to the dry kula lands, which were normally uncultivated, for a second crop of sweet potatoes. The native Hawaiians never diverted this surplus water, however, if any taro patches still needed water.^{260/} The references to surplus waters prior to the landmark decision of Territory v. Gay,^{261/} had not provided a consistent treatment of these waters.^{262/}

The first case that seemed to address this question was the 1895 case of Lonoaea v. Wailuku Sugar Co.,^{263/} which was one of the first cases to be decided after the major irrigation ditches began serving the sugar plantations. This case was also the first water case to be decided after the monarchy was overthrown. Although the dispute specifically involved prescriptive rights, the court, in the introductory paragraphs of the opinion, stated:

So, also, when the rains, either those falling in the mountains only, or when they were general, made freshets in the river, the Wailuku plantation would run off into reservoirs surplus water that otherwise would run into the ocean. This conservation of storm water was free to all who desired to appropriate it and we see no valid objection to its practice being continued.^{264/}

Significantly, however, the Lonoaea court limited the right to use surplus water by emphasizing the rights of others to these waters. The court's opinion seemed to adopt a correlative rights approach by stating

in dicta that "It would become objectionable if . . . any party . . . should take all the storm water and deprive others of an opportunity to do the same."^{265/} In this situation, one may reasonably infer that the court has applied the concept of riparianism to the surplus waters.

Subsequently, shortly after Hawaii was formally annexed to the United States, a claim was raised in Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co. (1902) ^{266/} testing whether the Loanoaea decision related to the rights of the parties in the surplus waters of the Wailuku River. "In other words, did that decision settle the question as to so-called surplus water; that is, the water, whether storm water or not, that was not covered by prescriptive rights."^{267/}

The plaintiff's predecessor in title was Claus Spreckels, a co-defendant with the Wailuku Sugar Co. in Loanoaea. The plaintiff in Hawaiian Commercial (1902) therefore was bound by the decision in Loanoaea to the extent that Claus Spreckels had been bound. Hence, the question on appeal in Hawaiian Commercial (1902) was how decisive was the Loanoaea opinion.

The 1902 Hawaii Supreme Court concluded that only prescriptive rights had been adjudicated in Loanoaea v. Wailuku Sugar Co. and expounded on the policy reasons for holding that Loanoaea could not have adjudicated rights to so-called surplus water. The Hawaiian Commercial court argued that it would have been strange if the court in Loanoaea intended to adjudicate surplus waters without more explicit language. Surplus waters involved questions of great difficulty. The Hawaii Supreme Court had apparently avoided passing upon such rights until specifically compelled to do so. The court had always regarded surplus waters as an unsettled issue.^{268/}

The issue of the ownership of surplus waters was finally confronted directly in a subsequent ruling in the same case, Hawaiian Commercial (1904).^{269/} In a bold opinion written by Justice Antonio Perry, who was first appointed to the Hawaii Supreme Court in 1900 and who later wrote the governing opinion in Territory v. Gay (1930),^{270/} the court permitted private ownership over these surplus waters. The controversy arose between two sugar plantations that together owned 99 percent of the ahupuaa of Wailuku, Maui. The Wailuku Stream emerged from the Iao Valley. It flowed out of the valley through a narrow defile. The course continued down a gulch through low hills and plains to the sea. The defendant had constructed a dam at the narrow defile and diverted water to kula lands in the ahupuaa. The ancient ditches, Kālaniauawai and Kamaauwai, also diverted water from the Wailuku Stream.

The 1904 court divided the controversial waters into three categories: "(1) those of the ordinary flow of the Wailuku Stream; (2) those of ordinary (small) freshets, which come about once in ten days; and (3) storm waters (large freshets)."^{271/} The court then re-divided the waters into two classes: "(a) surplus water, meaning thereby, . . . the water, whether storm water or not, that is not covered by prescriptive rights and excluding also riparian rights, if there are any, and (b) water

which is covered by prescriptive rights."^{272/} The term "prescriptive rights" in the foregoing passage included "the right of taro lands to water" or the ancient appurtenant rights.^{273/}

After establishing these various categories, the court held that "surplus water" was the property of the konohiki, meaning, in this case, the owner of the upper watershed area of the Iao Valley--the Hawaiian Commercial and Sugar Company. According to Justice Perry's opinion, the konohiki could use this water without limitation; the surplus water was not appurtenant to any specific portion of the ahupuaa. The Hawaiian Commercial (1904) decision derived this holding from its interpretation of ancient Hawaiian customs,^{274/} an interpretation that conflicts with other views of these customs.^{275/} Although Justice Perry quotes extensively from earlier cases for other parts of this opinion, he cites no decision or historical source for this conclusion, relying instead on his own views of ancient Hawaiian customs and the practical advantages of permitting private ownership and diversion for irrigation.^{276/}

Justice Perry was off the bench in 1917 when Carter v. Territory ^{277/} was decided, and, in fact, was Attorney General arguing for the Territory's claim to exclusive control over the surplus waters originating in watershed areas owned by the Territory. Perry argued that Hawaiian Commercial (1904) had held that the landowner of the source of the water could use the "surplus" water without restriction. Although one would think that a court would normally defer to the interpretation of a prior case offered by the person who wrote the opinion, in fact, the 1917 court rejected Perry's interpretation in favor of a sharing approach based on the principles of the riparian or correlative rights doctrines and on the traditional Hawaiian practices. The Carter court did not view the 1904 Hawaiian Commercial case as a governing precedent because that case had involved waters within the same ahupuaa while Carter involved waters that flowed from one ahupuaa to another.^{278/}

Territory v. Gay: Perry was back on the court in 1930 for Territory v. Gay,^{279/} however, this time as Chief Justice, and was then able to reaffirm his earlier view in favor of exclusive private ownership of "surplus" water. The decision divided the court, however, and each justice had a different view of the proper result. In particular, the 1930 justices disagreed on how the Hawaiian Commercial (1904) and Carter (1917) precedents should be interpreted and applied.

The three 1930 justices also disagreed on whether a distinction should be made between "normal surplus waters" and "storm-and-freshet surplus." As a result, they disagreed on whether the diversion of water was proper.

Chief Justice Perry explicitly applied his ruling in Hawaiian Commercial (1904), that the surplus water of the ahupuaa was the property of the konohiki by ancient custom, to the surplus waters of the key ili kupoas where the Hanapepe watershed originates. In his opinion, Perry included storm and freshet waters in the general term "surplus waters," and, therefore, advocated the overturning of the Carter decision on the riparian rule.^{280/}

Justice Parsons concurred in the Perry opinion insofar as it held that surplus waters belonged to the konohiki of the ili kupono. Parsons, on the other hand, disagreed with the overturning of Carter, claiming that Gay did not concern storm and freshet water, and that the riparian principle could apply to these waters.281/

Justice Banks dissented in full. Banks asserted that the riparian doctrine ought to be applied to both surplus and storm and freshet waters.282/

The Carter court had not meant to make a distinction between "normal surplus" and "storm-and-freshet surplus," although some language in the opinion is confusing.283/ The court seems to use the term "storm-and-freshet waters" to refer to the same waters that the Gay court was covering by the term "normal surplus." Nonetheless, these terms become the basis for considerable confusion in Gay.

Two of the Gay justices (Perry and Banks) saw no distinction between "normal surplus" and "storm-and-freshet surplus." These same two justices agreed that the principles of Carter should apply to both waters (Banks favored this approach) or to neither (this was Perry's view). Nonetheless, the two votes necessary for the result in Gay (Perry and Parsons) agreed only that Carter should not apply to "normal surplus" and left open the question of "storm and freshet" surplus. It is because of these ambiguities and inconsistencies that the Gay case has been treated as an uncertain precedent.

The Facts: The Gay case (1930) began as a suit in equity instituted by the Territory of Hawaii to enjoin the private landowners from diverting waters from Koula Valley to arid lands in the ahupuaa of Makaweli, on the island of Kauai. The Koula and Manuahi Valleys reach into the Alakahi Swamp on top of Mt. Waialeale. Both valleys share in the heavy rainfall on the summit of this central dome. Manuahi and Koula form the larger part of the upper part of the ahupuaa of Hanapepe. Their streams would flow into the Hanapepe Stream that flows through the ahupuaa of Hanapepe to the sea. The Territory, as representative of the United States, controlled Hanapepe ahupuaa. Koula and Manuahi Valleys, and a third parcel called Kano, belonged to the respondents, Aubrey Robinson and Alice Robinson.

A general principle important to the 1930 Gay decision was that an ili kupono was independent of the ahupuaa in whose outer boundaries it was situated. The konohiki of the ili kupono thus owed no tribute to the konohiki of the ahupuaa and was subservient directly to the king.284/

Note how similar the facts of Gay (1930) are to those of Carter (1917).285/ Both involve surface waters travelling from one land unit to another, and both raise the question of whether the upper landowner can divert all the water not claimed by owners of appurtenant and riparian rights. The Carter court, noting that this question was "one of first impression," ruled that the upper landowner's right to divert was limited by the requirement that the water flow not be diminished "to

such an extent as to deprive the lower [landowner] of its just proportion under existing circumstances."286/ The Gay majority (1930) rejected this analysis and held, in contrast, that the upper landowner could divert the "normal surplus waters" without such a limitation.

The Opinions: Chief Justice Perry, who served on the Hawaii Supreme Court from 1900 to 1904, 1909 to 1914, and 1922 to 1934,287/ asserted in Gay (1930) that there was "no distinction in history, in principle, or in law between surplus waters of the normal flow and surplus waters which come in freshets as a result of storms."288/ The term "surplus waters" was used to designate all waters not required for the satisfaction of prescriptive or appurtenant rights in the lower kuleanas or other lands. Perry supported his claim with reference to Hawaiian Commercial (1904). In that case, Justice Perry had defined "surplus water" as water, "whether storm water or not, that is not covered by prescriptive rights and excluding also riparian rights, if there are any. . . ."289/ The term "prescriptive rights," as used here, included appurtenant rights. Chief Justice Perry's opinion in Gay also maintained that Carter was in accord with the finding in Hawaiian Commercial (1904) insofar as the 1917 case stated as one of its conclusions that "the Territory is the owner of all the waters of the Waikoloa stream to the extent of the ordinary or normal flow . . ." and subject only to prescriptive rights and appurtenant rights.290/ This reference to Carter appears to be a misreading of the Carter opinion, because language later in that same paragraph in Carter 291/ indicates that the Carter court was not referring to the "surplus waters" in Perry's sense when it used the quoted language.292/

Perry, of course, had seen his arguments, as Attorney General, rejected by the Carter court, and so he set about to dismember the Carter holding as best he could now that he was back on the court. Although Perry refers to ancient Hawaiian customs and prior case law, his decision was based primarily on policy reasons related to the needs of the sugar industry for irrigation. Chief Justice Perry's primary goal was to limit the riparian doctrine, and his language on this subject was the final word on riparianism in Hawaii until 1973:

Our system of water rights is based upon and is the outgrowth of ancient Hawaiian customs and the methods of Hawaiians in dealing with the subject of water. No modifications of that system have been engrafted upon it by the application of any principles of the common law of England. To apply the principle of riparian rights to the matter of surplus freshet waters as was done in the Carter case is entirely at variance with preceding history and judicial precedents.293/

This important language can be criticized on several grounds. As discussed earlier in this text,294/ early Hawaiian decisions assumed that riparian rights existed in Hawaii. As an example, Peck v. Bailey, the first reported Hawaii decision on water rights, explained in dicta

that the king's conveyance of land bordering on the Wailuku River would include the rights in the river that had not been granted before. The implications seem to be clear. The Peck decision recognized the riparian rule.

Moreover, the language in the Enactment of Further Principles of 1850 (Kuleana Act) 295/ could also reasonably imply that the doctrine of riparian rights had been codified in Hawaii. The 1850 Act reserves to tenants and landowners the "right to drinking water and running water."296/

Chief Justice Perry, however, did not want to apply the common-law riparian doctrine to Hawaii's situation because of public-policy and logistical reasons. The Chief Justice asserted that riparian law was not suited to the conditions in Hawaii.297/ He confirmed that riparian waters could not traditionally be diverted for use on non-riparian land or lands beyond the primary watershed,298/ and he felt that because of this general principle the surplus waters would go "unused and wasted" as they flowed into the ocean.299/ Perry illustrated that if the riparian doctrine applied to the Koula Stream and the Hanapepe River, the practical result would be "the discontinuance of the use of [their] waters on the 5,200 acres or more of Makaweli lands and the substitution of a use on 1,900 acres of cane lands in Hanapepe. . . ."300/

The Perry opinion in Gay (1930) thus contended that riparian law posed a major danger to the whole economic and political system in Hawaii. The Chief Justice said that Carter would "upset the unvarying decisions concerning normal surplus and . . . endanger the foundations of the whole Hawaiian system and perhaps eventually the system itself."301/ Chief Justice Perry acknowledged that his decision favored the agricultural interests and conflicted with the doctrine of stare decisis, which normally requires courts to follow their earlier decisions:

It is far more logical and more desirable to correct now the one partial error of the Carter case in respect to freshet surplus, thus leaving the whole body of our decisions consistent and favorable to the best interests of our agricultural lands and giving due recognition to the principle of stare decisis302/

The efforts of Chief Justice Perry in deciding Gay (1930) failed to convince his associate Justice Banks, who handed down a strong dissenting opinion. Banks claimed that the Carter ruling was not inconsistent with preceding Hawaiian decisions. He further asserted that the riparian rule should be applied to normal as well as to storm surplus: "This rule [has been] so inherently just in its regulation of the use of an element that is vital to the well-being of mankind and is so consonant with natural rights and human necessities that I think it should be finally adopted as the law of this Territory."303/

In his dissent, Justice Banks rested his assertions upon basic reasoning. He stated that under Perry's ruling the owner of land upon which surplus waters originated was at liberty to squander and waste

such water, while those downriver may be in dire need of a sufficient quantity of water for irrigation.

Banks further showed a significant discrepancy between Territory v. Gay (1930) and City Mill Co. v. Honolulu Sewer and Water Com.,304/ an opinion decided in 1929 by the same three justices and written by the same Chief Justice Perry. In City Mill, which concerned a private party's right to waters in an artesian basin below the City of Honolulu, Perry applied the doctrine of correlative rights to artesian waters. The correlative doctrine permitted the property owners of tracts above the basin to a reasonable use of the water therein. Each property owner must exercise this right so as not to injure the rights of the others. Banks could "perceive no just reason for applying the correlative rights rule . . . to subterranean waters upon which all superjacent lands [have depended] for necessary moisture and not applying [the correlative rule] to surface waters, that flow through natural channels, and to which lower adjacent lands must look for necessary moisture."305/ It seemed unreasonable to Justice Banks that so long as the water remained in the artesian basin the owners of the lands above only had correlative rights to the waters, but if perchance the artesian waters broke to the surface and formed a pond or spring upon a privately-owned tract the owner of the property would then have absolute ownership of the water subject to appurtenant and prescriptive rights.306/

Finally, Banks emphasized that Carter was not incompatible with Hawaiian Commercial (1904), another opinion written by Perry as a Justice. The ruling in Carter involved the Waikoloa Stream that flowed from one ahupuaa into another ahupuaa. The plaintiff in this 1917 case explicitly asserted rights to storm waters that would flow onto his lower ahupuaa. Hence, the Carter court thought the application of riparian law a sound practice. Hawaiian Commercial (1904) concerned conflicting rights in the waters in the Wailuku River, which rises and flows to the sea in the same ahupuaa. The dispute arose between the owners of different portions of the same ahupuaa and concerned their proportional interest in the water.307/

Thus, we have three separate opinions in what apparently has been the landmark case on surface waters in Hawaii. Although Justice Parsons concurred with Chief Justice Perry on the issue of surplus water belonging to the konohiki of the ili kupo, the Justice also wrote a convincing partial dissent against Perry's attempt to overturn the Carter case. Justice Banks dissented from the Chief Justice in full. Banks favored the application of the riparian doctrine to all surplus waters. Under these circumstances, the opinion by Chief Justice Perry in Gay (1930) would seem to carry less weight because he failed to convince the other learned justices of his theories on surplus water.

Correlative Rights in Artesian Groundwaters

Up to this point, this section has concerned surface water rights. Groundwater rights, i.e., a property owner's right to artesian waters,

have been treated separately by the Hawaii Supreme Court. These rights are discussed most fully in the case of City Mill Co. v. Honolulu Sewer and Water Commission.^{308/}

Groundwater, like surface water, originates from precipitation upon the islands. Rainfall percolates down through the permeable rock of the island until it reaches a zone of salt water. Because fresh water is lighter than salt water, the fresh water moves laterally over the top of the salt water until it escapes at the coastline. As Oahu grew higher and wider by volcanic action, the increasing friction in the rock retarded the lateral movement of the fresh water. Continuous erosion formed an impervious caprock along the sea coast. The caprock also confined the underground fresh water. The weight of the fresh water gradually forced the salt water down. The fresh water displaced a portion of the salt water until an underground lens was formed.^{309/} For thousands of years this natural process continued without interference by humans.

In 1879, James Campbell drilled the first artesian well in the islands on his Ewa plantation on Oahu.^{310/} From this time on, numerous landowners and municipal governments began tapping this vast source of water, which was permitted without regulation for many years. The Hawaiians had no customs or regulations concerning the use or ownership of artesian waters.^{311/} When a dispute over rights to artesian waters finally arose in 1929, the Hawaii Supreme Court looked elsewhere for an applicable principle of law, but nonetheless adopted the sharing principles of the correlative rights doctrine which are similar to the ancient Hawaiian approach toward surface waters.

The Hawaii Legislature created the Honolulu Sewer and Water Commission in 1925 ^{312/} to plan and construct an adequate sewer and water system for the district of Honolulu.^{313/} By Act 222, 1927 Hawaii Laws, the legislature conferred certain additional powers upon the commission. The issue in City Mill emerged from conflict over Section 5 of this Act, regarding permits for new wells:

. . . If, in the opinion of the commission, the proposed work would threaten the safety of the water of the artesian area or basin which would be drawn upon by such well, by lowering its level or increasing the salt content of any existing well or wells, the application therefor may be denied.^{314/}

Pursuant to this Act, City Mill Co. filed an application with the commission and requested permission to drill an artesian well on its property. The property owned by City Mill was situated above the Honolulu water basin. The commission denied the application of the company for several reasons: (a) the drawing of water from the basin was larger than the supply of infiltration, (b) salt content of the basin was already high, (c) the city's water system already supplied water to the property owned by petitioner, and (d) the salt content in

the artesian water was increasing and moving inland. In the meantime, the commission continued to allow users of existing wells to draw water from the basin without restrictions.

The central question in City Mill thus became whether the commission could "without compensation to the applicants prohibit the boring of any new well while at the same time leaving all users of existing wells at liberty to draw water therefrom."^{315/}

Because this case was one of first impression, Chief Justice Perry examined several alternatives by which the parties could assert their rights. In the end, the supreme court held that:

Their rights are correlative. Each should so exercise his right as not to deprive others of their rights in whole or in part. In times of plenty greater freedom of use probably can be permitted and ordinarily would be permitted without question. In times of greater scarcity or of threatened scarcity or deterioration in quality of the waters, all would be required under this view to so conduct themselves in their use of the water as not to take more than their reasonable share.^{316/}

This doctrine of correlative rights to subterranean waters whose channels were undefined modified the common law maxim of cujus est solum, ejus est usque ad inferos ("he who owns the soil owns it to the lowest depths below"), by the civil law maxim of sic utere tuo ut alienum non laedas ("so use your own as not to injure another's property").^{317/}

The Chief Justice wrote at length to justify rejecting the common law maxim for public policy reasons. The common law maxim essentially would convey to the proprietor of property absolute ownership of all the water that naturally flows from the artesian well on the property. If the artesian well is drawn therefrom by any pump, the proprietor would still enjoy absolute ownership and could "use the water as he pleases and may conduct it to supply lands and communities at any distance from his own piece or parcel of land and may even waste it."^{318/} Perry claimed that this maxim proceeded upon the assumption that the water found in the land is part of the land.

He then pointed out that this assumption runs counter to the basic facts of an artesian basin. Artesian waters flow freely through broken rock or other substances permitting easy passage. No artesian basin is ever found complete in itself, within the boundaries of a particular tract of land. The water of the entire basin inevitably flows toward the lowest level.^{319/}

Chief Justice Perry thus preferred the doctrine of correlative rights to the common law maxim. Under this doctrine, each landowner cannot extract more water than a proportionate share. Perry stated that

under some circumstances, the landowner may divert water to lands other than that of origin.^{320/} The Chief Justice did not expand on this statement. In any event, Perry permitted only the correlative use, and not the absolute ownership, of artesian wells situated upon private properties.

City Mill also held that the Territory was not the owner of all artesian waters in the islands. The court believed that prior to 1845, the king was the sole owner of all the lands. Then in the late 1840's, the king "voluntarily" abandoned his total ownership, and land tenures became vested in individuals. In the transition, "all mineral or metallic mines" were reserved to the Hawaiian government, but the groundwater was not similarly reserved.^{321/}

Under the prevailing doctrine of correlative rights, and the ruling that the Territory did not own all artesian waters, the Hawaii Supreme Court held that the Territory, in times of peace, could not deliberately confiscate the water rights of the petitioner simply because the community as a whole needed the water. Such action would deprive an owner of his property right without just compensation in violation of the Constitution of the United States.^{322/}

Chief Justice Perry never reconciled his 1929 opinion in City Mill adopting the correlative rights doctrine for groundwaters with his opinion the next year in Gay (1930) giving private property owners exclusive rights to surface waters. Justice Banks stated in his dissent that it was unreasonable to limit owners of lands above artesian basins to correlative rights while giving owners of land containing surface waters, ponds, or springs absolute ownership of the water subject to appurtenant and prescriptive rights.^{323/}

The Current Litigation: McBryde Sugar Co. v. Robinson (Hawaii 1973) and Robinson v. Ariyoshi (D. Hawaii 1977)

Introduction.

We believe that the doctrine of stare decisis is subordinate to legal reasons and justice and we should not be unduly hesitant to overrule a former decision when to do so would bring about what is the considered manifest justice.^{324/}

As the previous section discusses, several key Hawaiian decisions early this century authorized the private ownership of surface waters and several cases allowed the transfer of such waters to non-appurtenant lands or kula lands.^{325/} The distinction between water rights and land ownership was virtually lost in these early cases. In McBryde Sugar Co. v. Robinson (1973),^{326/} the Hawaii Supreme Court rejected these judicial precedents and instead looked for guidance to two early Hawaiian statutes: (1) The Principles Adopted by the Land Commission in 1846,

and (2) the "Enactment of Further Principles" in 1850. These two statutes, which are described in detail on pages 154-60, above, seem to reserve to the people some rights to water, even after land has been conveyed to private owners in fee simple. Justice Abe, speaking for a 3-2 majority, held that these statutes govern the situation despite the earlier contrary judicial decisions.

- The Facts of McBryde.

The case arose out of a dispute among owners of land in Hanapepe Valley, Kauai, respecting their rights to the surface waters in the valley. McBryde Sugar Company, Ltd., a subsidiary of Alexander and Baldwin, owns the ilis kupono ^{327/} of Eleele and Kuiloa, situated in the southeastern portion of the valley. Gay & Robinson owns the ilis kupono of Koula and Mamahi, located in the northeastern and northwestern portion of Hanapepe Valley. The State of Hawaii owns the ahupuaa of Hanapepe, located in the southwestern portion of the valley. Small owners of property are also situated in the valley.

The two principal users of water in Hanapepe are McBryde Sugar Company and the partnership of Gay & Robinson. Both have long used substantial amounts of surface waters of the valley for sugarcane irrigation within and without the Hanapepe watershed. In 1948, Gay & Robinson introduced an improved ditch and tunnel system to transport water to the arid lands of Makaweli, west of Hanapepe. The new water system increased the amount of water taken from the Koula Stream, to the detriment of downstream landowners, such as the McBryde Sugar Company. (See page 169, above.)

After several years of attempted negotiation, McBryde went to court in 1959, and the circuit court for Kauai adjudicated the relative water rights of the landowners in the region. This decision did not satisfy the parties, however, and Gay & Robinson, McBryde, and the State all appealed to the Hawaii Supreme Court.

The Ownership of Surface Waters.

Writing for the majority, Justice Abe acknowledged that all the landowners have appurtenant and riparian rights to some water. He relied, however, on the statutes of 1846 and 1850 to rule that "surplus waters"^{328/} could not be privately owned.

The 1846 "Principles" and the Great Mahele.

Justice Abe looked to the Great Mahele of 1848 ^{329/} and the laws that implemented the Mahele to examine what the king actually intended to convey in his division of the kingdom's lands. One of the "Principles" adopted by the Land Commission (and approved by the Legislative Council) stated that a "sovereign prerogative" of the king was "to encourage and even to enforce the usufruct of lands for the common good."^{330/} The Principles also stated that these prerogatives could not be surrendered by the king.^{331/}

In light of the foregoing provisions, the majority logically believed that the most important "usufruct" of land was water, and that the right to water was reserved for the people of Hawaii for their common good.^{332/} Thus, the court maintained that the Mahele could not have transferred all rights to water to private hands, and that:

. . . the ownership of water in natural watercourses streams and rivers remained in the people of Hawaii for their common good. Therefore, we hold that as between the State and McBryde, and between McBryde and Gay & Robinson, the State is the owner of the water in the Koula Stream and Hanapepe River.^{333/}

Justice Levinson dissented from this interpretation of the 1846 Principles. He argued that "the Land Commission was given the authority not only to confirm private allodial titles to land, but also to do so 'in accordance with . . . native usages in regard to . . . water privileges.'^{334/} Justice Levinson then examined ancient Hawaiian uses, of water, relying mainly on the views of Western commentators who wrote that the konohiki had the absolute right to control the disposition of surplus waters.^{335/} Levinson ignored the views of other knowledgeable commentators (examined on pages 146-53, above) who explained that neither the konohiki nor the king had absolute rights to the water, but rather that water was a public commodity held in trust for all.

Justice Levinson also argued that an absurd result would follow if all usufructs to land were retained by the king after the Mahele because then only "bare legal title" would have passed by the Land Commission awards.^{336/} He quoted extensively from the cases prior to McBryde, some of which (as explained above) concluded that rights to water and land were not separable.^{337/} He then introduced the 1917 Report of the Water Commission of the Territory of Hawaii to the Governor.^{338/} The Commission was apparently asked to revise the water laws of the Territory should such a change be found necessary. The Commission ultimately recommended the adoption of a detailed code relating to underground artesian waters. Levinson pointed out that the 1917 report declined to recommend any legislation concerning surface waters because it was determined that "we already [had] a very good workable method for the determination of rights to surface waters. . . ."^{339/}

Justice Levinson's final argument was that the doctrine of equitable estoppel should be applied against the State in its claim to ownership of surplus waters. Gay & Robinson had presented evidence that included: (a) the government's silence while Gay & Robinson spent large sums of money to develop surplus waters, and (b) the government's taxation of surplus waters as privately owned by Gay & Robinson.^{340/} He thus asserted that the equities are with the private parties who acted in reasonable reliance on the government's action or inaction, and that the government ought not to reverse previous policies with respect to property.^{341/}

Justice Levinson argued that precedents prior to McBryde on the issue of private ownership of surplus waters were based on "long established" principles ^{342/} and that the majority's opinion was a "radical" ^{343/} and "unforeseeable" ^{344/} departure from these principles. The review of these cases earlier in this section, however, seems to indicate that the water law prior to McBryde was hotly contested over the years and was not settled or secure. Thus Justice Abe may not have been unreasonable in introducing what he believed to be the controlling statute on water rights in Hawaii.

The 1850 Enactment of Further Principles.

Justice Abe's second attack against the private ownership of surplus waters was grounded in the Enactment of Further Principles, adopted in 1850. That statute, also called the "Kuleana Act," states that "the people also shall have the right to drinking water, and running water, and the right of way."^{345/} This provision now appears in Hawaii Revised Statutes, Section 7-1.^{346/}

Justice Abe argued that this enactment codified the riparian doctrine in Hawaii. He maintained that "running water" must have meant water flowing in natural watercourses, because running water in artificial watercourses was excepted from the statute.^{347/} He also referred to the missionaries who came from Massachusetts and brought with them the English common law as recognized in Massachusetts. The New England state courts considered water in natural courses to be publici juris, meaning that it was public and common and that all who have right of access to the water may reasonably use it.^{348/} (See page 216, below.)

The McBryde court thus held that the State, McBryde Sugar Company, and the partnership of Gay & Robinson, as owners of property adjoining Koula Stream and Hanapepe River, had riparian rights to those natural streams. In other words, they had "the right to use water flowing therein without prejudicing the riparian rights of others and the right to the natural flow of the stream without substantial diminution and in the shape and size given it by nature."^{349/}

Justice Levinson asserted in his dissent that the majority erred in concluding that the doctrine of riparian rights had been codified in Hawaii. Although he acknowledged the policy arguments against the riparian system in the islands,^{350/} Levinson based his conclusion on statutory construction, an analysis of ancient usage, and judicial precedent.

Levinson argued that Section 7 of the Enactment of Further Principles guaranteed the hoainas or tenants the right to water only for irrigation and other domestic purposes.^{351/} This limitation on the provision would weaken the majority's interpretation of it as the codification of the riparian doctrine. Justice Levinson asserted that the right to use water for irrigation is antithetical to the doctrine of riparianism as it existed in mid-nineteenth century England and Massachusetts,^{352/} and he argued that the majority's reliance on the 1850 statute was misplaced.

The dissent then turned to whether Hawaiian judicial precedent and ancient usage established a water system different from the riparian doctrine and argued that the earlier cases had departed from the riparian approach (see below).^{353/}

The Transferability of Water.

Although the court's majority held that the state owned the excess surface waters, they recognized that private parties had certain vested rights to water. They acknowledged the ancient appurtenant rights of the principal parties in McBryde.^{354/} The majority held that appurtenant water rights pertained to particular parcels of land conveyed by the original grant from the king and could not be transferred to another watershed.^{355/} The majority also recognized the existence of riparian water rights but adhered to the strict rule of riparianism that prevented the transfer of riparian waters to non-riparian land.^{356/}

Justice Levinson dissented from the court's holding regarding the non-transferability of appurtenant and riparian water rights. He quoted from Western commentators who wrote that traditionally the ancient Hawaiians did transfer water to non-appurtenant or non-riparian land.^{357/} Levinson failed, however, to acknowledge the trust relationship that existed in the ancient Hawaiian system. Taro growers along streams enjoyed a higher priority than farmers on kula land and water was not diverted if taro farmers would be injured as a result.^{358/} Justice Levinson also stressed that the transfer of water had become important in Hawaii because of large-scale sugarcane cultivation in the islands.^{359/} Finally, Justice Levinson emphasized the Hawaii judicial precedents that permitted the transfer of water to non-appurtenant lands, relying heavily on Chief Justice Perry's opinion in Territory v. Gay (1930).^{360/}

In sum, Justice Abe for the majority in McBryde strictly construed the term "appurtenant" and limited appurtenant water rights to the particular parcel that originally had water rights. Abe also used the strict interpretation of the riparian doctrine which rejected any substantial diminution of the natural flow of the stream. Waters in excess of appurtenant and riparian rights belong to the state as trustee for the people. Justice Levinson, in contrast, interpreted ancient Hawaiian usage as understood by Western commentators and relied upon judicial precedents prior to 1973, particularly Territory v. Gay (1930), to argue that private ownership of "surplus" waters should continue to be recognized.

Robinson v. Ariyoshi (D. Hawaii 1977).

The private landowners involved in the Hanapepe litigation appealed the McBryde ruling to the U.S. Supreme Court after the Hawaii Supreme Court affirmed its original decision on rehearing, but the U.S. Supreme Court dismissed the appeal "for want of jurisdiction."^{361/} The landowners then turned to the U.S. District Court for the District of Hawaii, and Senior Judge Martin Pence issued an opinion on October 26, 1977, declaring the opinion of the Hawaii Supreme Court's majority to be

"untenable and void."^{362/} This decision raises serious procedural questions analyzed on pages 200-18, below. On the substantive issues, Judge Pence relies heavily on Justice Levinson's dissenting opinion. Judge Pence described Justice Levinson's dissent as "probably the finest opinion of his judicial career" and stated that "this court in substance adopts his analysis of those principles as a component part of its own decision."^{363/}

The federal judge described the majority's holdings in McBryde as "completely revolutionary."^{364/} "It was strictly a 'public-policy' decision with no prior underlying 'legal' justification therefor."^{365/} "The entire rationale of the majority is one of the grossest examples of unfettered judicial construction used to achieve the result desired-- regardless of its effect upon the parties, or the state of the prior law on the subject."^{366/} The State of Hawaii has appealed this ruling to the U.S. Court of Appeals for the Ninth Circuit, and a decision on appeal can be expected in 1979 or 1980.

Summary and Conclusions

This section is unusually long because the litigation over water in Hawaii has been hotly contested and the judicial decisions have been convoluted and erratic. Many issues remain unsettled. The views of the Hawaii Supreme Court have changed when the membership of the court has changed. Doctrines were frequently overruled within a few years after they were announced in earlier decisions. The economic, social, and political conditions of the islands have had a profound effect on the law that has been articulated by the justices. Although many opinions purport to rely on ancient Hawaiian usages, Western commentators and justices appear frequently to have recast those ancient usages to serve their modern purposes. No doubt the fact that most justices until recently were Westerners affected their interpretations of the law. The rapid changes in the law may also have resulted from the fact that the highest court for years consisted of only three justices.

The Hawaii Supreme Court did in 1904 and 1930 permit private ownership and transfers of surplus waters, but the court in 1917 and 1929 decided related cases on different principles. Even in the important 1930 case of Territory v. Gay, the three justices could not agree on the governing principles and each wrote separate opinions.

It seems surprising, therefore, to find the federal district court describing Hawaii's water rights law as "generally, well settled and stable prior to McBryde I," as the court did in Robinson v. Ariyoshi.^{367/} The water rights law appears instead to be highly confusing, an amalgam of Western ideas imposed on traditional Hawaiian practices.

The Hawaii Supreme Court's majority decision in McBryde is a good faith attempt to sort through this confusion and return to the historical roots of the islands. The court bases its interpretation

squarely on statutes and specifically invites the state legislature to re-examine these issues in order to bring them in line with modern needs of the community.368/

THE PROCEDURAL FEDERAL-STATE ISSUES RAISED BY
ROBINSON V. ARIYOSHI AND THE PROBABLE
RESOLUTION OF THIS CONFLICT 369/

Introduction

As explained on the preceding pages, the federal district court's 1977 decision in Robinson v. Ariyoshi 370/ directly contradicts the view of the Hawaii Supreme Court's majority in its 1973 decision of McBryde v. Robinson 371/ on the rules that govern water rights in Hawaii. Senior Federal District Judge Martin Pence felt that the reasoning and scholarship of the dissenting justices of the Hawaii Supreme Court 372/ were superior to that of the majority justices and that the majority's decision amounted to a "taking" of property in violation of the United States Constitution.373/ Judge Pence thus "voided" 374/ the McBryde decisions and enjoined the State from carrying out or enforcing any of the rulings in McBryde.

The dispute over the reasoning and scholarship of the Hawaii Supreme Court justices is, of course, an important controversy, which this report examines in the previous section. Equally important is the question of the power of a federal district court to intervene in this controversy. This section analyzes the procedural issues raised by Judge Pence's action to help predict what will happen to the federal case on appeal. This section also addresses the question of whether the State can act now to clarify water rights despite the fact that federal litigation is continuing.

Hawaii's sugar companies were greatly disturbed by the 1973 McBryde decision of the Hawaii Supreme Court, because they interpreted the decision as denying them access to the water they had been using for years to irrigate cane lands and as denying them the ability to transport waters from one part of an island to another. Their first step was to seek review before the United States Supreme Court. Such review was ultimately denied.375/ Meanwhile, the sugar companies filed suit in the Federal District Court for the District of Hawaii and in October, 1977, Judge Pence ruled in their favor.376/

The State subsequently filed an appeal of Judge Pence's decision in the United States Court of Appeals for the Ninth Circuit. The last briefs on the case were scheduled to be filed December 29, 1978, and a decision could be rendered in the middle of 1979 or later. If an appeal is taken to the United States Supreme Court from the Ninth

Circuit's decision, that would delay the final ruling on Robinson until after 1980. The uncertainty caused by this litigation and the prolonged nature of this uncertainty has been a major obstacle to the formulation of a clear water management policy. The impact of this litigation on legislative or constitutional action over water rights has not been clarified. Thus, many observers have taken the position that nothing can be done in terms of water management until the McBryde-Robinson litigation is completed. This issue is addressed below.

It is also necessary to determine the meaning and effect of McBryde if Robinson is reversed on appeal. Does McBryde foist upon the State an "unwanted bill of goods" in terms of water rights doctrines which the State will be powerless to modify? The purposes of this section are thus to (a) delve into the nature of the legal uncertainty caused by the McBryde-Robinson litigation, (b) determine the likely outcome of the Robinson appeal, and (c) analyze the propriety of legislative action now in light of the continuing federal litigation.

Robinson on Appeal

If Robinson is affirmed on appeal, then (because it "voided" the McBryde decision) the State of Hawaii's water law will be returned to a pre-McBryde status. In other words, the surface waters will be essentially controlled by the landowner of the water's source.377/

If Robinson is reversed, then McBryde will be allowed to stand. The task would then become one of interpreting the force and effect of McBryde's two apparent rulings, i.e., (1) that the State is the "owner" of the surplus waters 378/ and (2) that the private landowners cannot transport the surplus waters from one watershed to another.379/ The decision of the appeals court may not, however, turn on the merits of these issues, but rather on the procedural propriety of the federal district court's intervention at this stage of the litigation.

Federal Courts Cannot Act as the Appellate Courts of the State.

One basis for predicting a reversal of Robinson is that the federal district court was, in Robinson, improperly acting as an appellate court of the State. The issues 380/ in Robinson and McBryde appear to be the same. Both cases involve a determination of the ownership rights of various parties to the surplus waters of the Hanapepe River. The Supreme Court of Hawaii in McBryde held that the State was the "owner" of such waters. The court in Robinson, however, ruled that the State could not be the owner, insofar as such a decision would result in an unconstitutional "taking." The court ruled that either of the two private landowners before the court was the owner of the water and remanded this issue to the state trial court.381/

Hence, the "ultimate practical question" 382/ was the same in both cases. The federal court, however, characterized the Robinson action as "original" and as one arising out of the McBryde decision itself. But,

if the "correctness" or constitutionality of every appellate decision were to create a new cause of action, then there could be no end in resolving disputes. Every appellate decision could be collaterally attacked in a state or federal trial court. If judicial decisions create causes of action, there would be no "finality" and the appellate process would be totally undermined.

For example, an aggrieved party, such as the State, might after Robinson bring a cause of action in state court alleging that the Robinson decision "took" property. Because state courts have concurrent jurisdiction over constitutional questions, nothing would prevent the state court from assuming jurisdiction and enjoining federal officials from enforcing Robinson.

A second reason which the Robinson court may have used to characterize the action as "original" was that new parties were added as defendants. These "new" parties were the governor and other state officials responsible for carrying out the McBryde decision.

However, the addition of these parties does not make the Robinson action an "original" one.^{383/} The sugar companies are still, in essence, seeking an appeal or redetermination of the McBryde case. The effect of adding state officials who are responsible for enforcing state judicial decisions cannot disguise the true nature of Robinson as an appeal. Petitioners are attempting to accomplish the effect of an appeal by enjoining the State from acting, the precise effect of an appeal. Quite simply, a redetermination of the validity of McBryde in order to avoid the direct consequences of the decision is an appeal of McBryde. The Robinson court has allowed form to prevail over substance.

Although Congress may have the power to grant federal district courts the right to review state court decisions,^{384/} they clearly have not done so.^{385/} Only the United States Supreme Court has jurisdiction to review state supreme court decisions,^{386/} and in this litigation, the United States Supreme Court decided not to exercise that power.^{387/} Moreover, the United States Supreme Court has stated in Rooker v. Fidelity Trust,^{388/} that the federal district courts do not have the power to review state court decisions. In Rooker, the Court stated that the lower federal courts may not choose to act "directly," or, as the Robinson court has attempted to act, "indirectly" to review state court decisions.^{389/}

A number of reasons can be offered to explain why the lower federal courts cannot and should not act as the appellate courts of the state:

First, allowing federal court review like that of Robinson would substantially diminish the authority and sovereignty of the state court system. It is an established principle that state court decisions are controlling on issues of state law.^{390/} However, if federal courts could assert jurisdiction every time a litigant argued that a state supreme court decision was unconstitutional on the grounds that it modified prior state law, then we would have little need for a state

judicial system. State courts would be largely useless and impotent, because they could not speak with finality on any issue. Few would be interested in bringing suit in state court because any losing party who argues that the result was unexpected or "unpredictable" ^{391/} could conceivably obtain jurisdiction for review in federal court.

Second, because federal courts could assert jurisdiction whenever state law changed, state courts would be deprived of their primary responsibility for fashioning state law. By voiding a decision, as in Robinson, federal courts would in effect determine state law by declaring what state courts could not do. The state court could never reconsider or alter prior law without fear of reversal.

Third, not only would this assumption of appellate power by lower federal courts be without the necessary congressional authorization, but it would also increase the workload of the federal courts in contravention of the express desire on the part of Congress and the Supreme Court to reduce the workload of the federal courts.^{392/}

Fourth, the jurisdiction of the federal courts, as expressed in the relevant jurisdictional statutes, 28 U.S.C. sec. 1331 and 28 U.S.C. sec. 1343, is strictly "original." The grants of jurisdiction embodied in these sections should not be read to undermine the exclusiveness of United States Supreme Court review of state court decisions as expressed in 28 U.S.C. sec. 1257.

Fifth, allowing federal courts to review state court decisions as in Robinson would undermine Section 1257's requirement that an appeal from a state court be from the highest court of the state ^{393/} and that such an appeal be timely filed.^{394/} Moreover, Robinson-type review where a new trial is granted would undercut the Supreme Court's requirement that review of state decisions be limited to the facts on the state court record.^{395/}

Thus, it seems clear that the doctrine expressed in Rooker, that lower federal courts may not, under any circumstances, act as the appellate court of a state, serves an important purpose in maintaining the balance between the state and federal courts. The fact that federal court intervention as in Robinson creates so many of these problems points toward reversal on appeal.

The Court in Robinson Lacked Jurisdiction Because the Case Presented No Substantial Federal Question.

The court in Robinson assumed jurisdiction based on the existence of a "federal question," that is, a cause of action raising an issue under federal statutory or constitutional law.^{396/} The federal question asserted in Robinson was that the McBryde decision "took" petitioners' water rights without compensation, as prohibited by the fifth amendment.

In large part, the argument that courts can "take" property is based solely on the unsupported reasoning of Justice Stewart's concurring opinion in the 1967 case of Hughes v. Washington.^{397/} In a 1946 decision, the Supreme Court of Washington had construed Article 17 of the Washington State Constitution to hold that title to gradual shoreline accretions vested in the owner of the adjoining land. In a decision twenty years later, the Supreme Court of Washington reversed itself and held that Article 17 terminated the rights of such landowners. Justice Stewart posed the problem in the following manner: "Does such a prospective change in state property law constitute a compensable taking?"^{398/}

Answering this question in the affirmative, Justice Stewart argued that such changes in state law constituted a "taking" violative of the fifth amendment:

[A] state cannot be permitted to defeat the constitutional prohibition against taking property without due process of law by the simple device of asserting retroactively that the property it has taken never existed at all. Whether the decision here worked an unpredictable change in state law thus inevitably presents a federal question for the determination of this Court.^{399/}

Thus, according to Justice Stewart, state law which is in the process of changing does not remain solely an issue of state law:

To the extent that the decision of the Supreme Court of Washington on that issue arguably conforms to reasonable expectations, we must of course accept it as conclusive. But to the extent that it constitutes a sudden change in state law, unpredictable in terms of relevant precedents, no such deference would be appropriate.^{400/}

Justice Stewart's view is based on an "I-know-it, when-I-see-it" reasoning. It must be a "taking" because prior to the decision the landowners had the property which is suddenly no longer their property after the decision. Obviously, in the eyes of Justice Stewart, property was "taken." It is no less so when the result of action taken by the judiciary instead of by the executive branch:

Because the Due Process Clause of the Fourteenth Amendment forbids such confiscation by a State, no less through its courts than through its legislature, and no less when a taking is deliberate, I join in reversing the judgment.^{401/}

However, no matter how "logical" this view is, it creates insurmountable practical and theoretical problems in terms of the balance between state and federal courts.

The traditional view is that courts in their mediational roles do not "take" property from one litigant and "give" it to another. Courts do not "take," they "declare" what rights each litigant has. Other agencies of the State, charged with the enforcement of judicial decisions (such as sheriffs) can "take" property. The courts themselves, however, do not "take" but only make declarations upon which other state agencies or officials may eventually "take." Hence, it is incorrect to assert that the McBryde decision itself was an unconstitutional deprivation of property. The decision only declared rights. In that sense, the decision could be "wrong" (in terms of ignoring precedent) but, the decision itself could not be called "unconstitutional."

Other governmental action resulting from the McBryde decision could conceivably be unconstitutional and could constitute a taking. If such action did constitute a "taking," then the Robinson petitioners would have had a cause of action if they could have specified the nature of the threatened government action. The government, however, had not taken or threatened any imminent action, because all parties were waiting for further judicial interpretation. It could be argued, therefore, that the allegation of a governmental taking was not "ripe" for judicial review.

In any event, the Robinson court did not believe it necessary to specify any threatened governmental action in order to establish a possible "taking." In the eyes of the court, a "taking" had already occurred in the form of the declarations contained in McBryde.

Not only is it logical to state that as a general rule courts "declare" and do not "take," but more specifically, in terms of adjudicating title and ownership rights, courts cannot be said to be "taking" ownership from one party and giving it to another. Rather, in this situation the judge is "finding" who was the true and original owner.^{402/}

The notion that judges "find" rather than "make" law is the traditional "Blackstonian" ^{403/} view of the appellate process. However, strict adherence to this judicial philosophy was set aside with Supreme Court approval of the technique of prospective overruling.^{404/} Although it has been argued that prospective overruling should be favored in property cases,^{405/} this technique simply does not work for the determination of ownership or title which was at issue in McBryde.

The concept of ownership is inherently retroactive. When one speaks about "ownership" one is speaking about a characteristic or quality of the item that has an ultimate final answer. There is, in other words, a "true state" of ownership. Thus, decisions involving ownership require a search to "find" who is the true owner. In this sense, prospective overruling would be totally inappropriate as applied to ownership questions. Thus, any redetermination of ownership must be retroactive in nature.

It is this retroactive nature of the decision which causes so many problems in McBryde. It cannot be said, after McBryde, simply that the State is now the owner of the surplus water. The decision holds that the State has always (retroactively) been the owner of the surplus water. Others, namely, McBryde and Robinson who have used the waters, have never (retroactively) been the "owners" of these waters. It is this retroactive nature of McBryde which many perceive as constituting a "taking" by the State of the water without compensation.

The constitutionality of retroactive overruling has had a confused history in the law.^{406/} At one point the United States Supreme Court did rule that retroactive overruling could be unconstitutional.^{407/}

In Muhlker v. New York and Harlem Railroad,^{408/} the petitioner alleged that the decision of the New York Court of Appeals which reversed earlier law constituted a deprivation of property without just compensation. When plaintiff Muhlker purchased his land in 1888, New York law held that the erection of an elevated railroad was not a public purpose or street use within the meaning of an 1813 New York statute. The statute, thus interpreted, allowed a property owner to sue anyone for damages who built an elevated railroad adjacent to the property. Subsequently, the New York and Harlem Railroad constructed a track in front of Muhlker's property. The New York Court of Appeals reversed its prior decision and held that an elevated railroad was a public use within the meaning of the statute. Therefore, Muhlker could not sue. The United States Supreme Court, however, reversed and held that the New York Court of Appeals' decision, which retroactively overruled the cases upon which Muhlker had relied, constituted a deprivation of property without due process of law.

The facts in Muhlker are similar to those in McBryde. In McBryde, petitioners claim to have relied on earlier cases establishing that certain adjoining landowners could own the surplus waters of a stream. As in Muhlker, McBryde overruled earlier decisions ^{409/} in order to hold that the State was the "owner" of the private waters of the stream. Hence, if Muhlker has continued validity, it is an important case upon which the Robinson petitioners can rely. Petitioners have cited Muhlker in all of their post-McBryde arguments. Moreover, Judge Pence in Robinson also based his decision on the Muhlker ruling.^{410/}

Thus, a critical question in determining the likelihood of the reversal of Robinson is whether Muhlker is still a good precedent. Twelve years prior to Muhlker the Supreme Court took the opposite position in Central Land Co. v. Laidley.^{411/} In Laidley, the West Virginia Supreme Court reinterpreted a statute to hold that a deed, which had been valid under an earlier construction of the statute, was invalid, and held that a later deed conveyed proper title. The petitioner claimed that the new construction was an unconstitutional deprivation of property without due process. The United States Supreme Court rejected this argument. In contrast to its later position in Muhlker, the Court stated that an "erroneous decision of a state court does not deprive the unsuccessful party of his property without due process of law."^{412/}

Thus, Laidley and Muhlker are at odds with each other. Although Muhlker has never been expressly overruled, in a number of subsequent cases the Court has followed Laidley and not Muhlker, undercutting the assertion that retroactive overruling could be unconstitutional.^{413/}

Finally, two Supreme Court cases, one in 1930 and another in 1938, implicitly eliminated any validity remaining in the views expressed in Muhlker. In 1930, the Supreme Court decided Brinkerhoff-Faris Trust and Savings Co. v. Hill,^{414/} and reaffirmed the position it took in Laidley that an erroneous state court decision could not deprive litigants of any right guaranteed by the substantive component of the due process clause.^{415/} In essence, on issues of state law, whether right or wrong, state courts are final and the Supreme Court is bound by that determination. Thus, state court decisions that overrule prior law cannot "take" property in a fifth amendment sense.

The court in Brinkerhoff-Faris also made an important distinction. It held that although a state court decision could not deprive a person of property in a fifth-amendment substantive-due-process sense, courts could act to deny persons of procedural due process in violation of the fourteenth amendment. The court said:

Our present concern is solely with the question whether the plaintiff has been accorded due process in the primary sense,-- whether it has had an opportunity to present its case and be heard in its support.^{416/}

Much of the confusion over whether state courts can "take" has been caused by the manner in which the fifth amendment is made applicable to the states. Until 1897, the fifth amendment's "taking" provision was not applicable to the states. In Chicago Burlington and Quincy R. R. v. Chicago,^{417/} the fifth amendment was held to apply to the states through the fourteenth amendment. Because some support exists for including state courts within the definition of "states" in the fourteenth amendment, it has been argued that the fourteenth amendment due process clause incorporates the application of the fifth amendment to the actions of state courts.^{418/}

However, careful analysis of Brinkerhoff-Faris should make clear the distinction between the substantive and procedural components of the due process clause. Brinkerhoff-Faris sanctions only the application of procedural due process to the actions of state courts. Hence, in view of Brinkerhoff-Faris and the cases that ignored Muhlker and followed Laidley,^{419/} there can be no federal question based on a "takings" argument.

The second case that substantially undercut Muhlker was Erie v. Tompkins, decided in 1938.^{420/} One of the weaknesses of Muhlker was that it implicitly relied on Geipcke v. Dubuque.^{421/} The Geipcke line of cases ^{422/} stood for the principle that in determining whether to apply an earlier state supreme court decision or a later overruling

state supreme court decision, which possibly constituted a "taking," a federal court hearing the case under diversity jurisdiction had the freedom of selecting the earlier state decision in order to avoid a "taking." However, this ability to ignore the latest state supreme court decision was based on the peculiarities of diversity jurisdiction and the confusion under Swift v. Tyson 423/ as to which state decision could be applied.

After Erie, the federal courts, when acting under diversity jurisdiction, have no power to choose between the earlier and later state decisions. Erie commanded the federal court to apply the latest state court decision regardless of whether that decision resulted in a retroactive overruling of prior law. Thus, to the extent that Muhlker relied on Gelpcke, this rationale for Muhlker was swept away with the advent of Erie in 1938. If Robinson rests upon a view that the retroactive overruling of earlier decisions is an unconstitutional deprivation of property without due process, the only case supporting that position is Muhlker, which has been moribund for years.

Thus, no case or sound legal theory supports the assertion that courts can "take" in violation of the fifth amendment. No valid basis exists on which to assert federal question jurisdiction, and Robinson is also subject to reversal for this reason.

Res Judicata.

A third reason supporting reversal of Robinson is that the doctrine of res judicata should have been applied to bar the federal court from hearing the case. Simply stated, the doctrine of res judicata prevents a trial court from hearing a case that has already been decided on the merits by a different court. The Latin words might be translated "the matter has been adjudicated." The purpose of res judicata is to provide a point of finality in the judicial process.424/

Thus, if a case is brought in one court and pursued to a judgment on the merits, the losing party cannot refile the same causes of action in a different court. The question presented in Robinson is whether a federal district court is compelled to apply res judicata to causes of action in McBryde that were litigated in state court.

It can be argued quite forcefully that a federal district court sitting in the state where judgment was rendered must apply res judicata as if it were a state court and were so compelled by the substantive law of the state. The basis for this assertion lies in the force and effect of a federal statute, 28 U.S.C. sec. 1738. That section provides:

The . . . judicial proceedings of any court of any . . . State . . . shall have the same full faith and credit in every court within the United States . . . as they have by law or usage in the courts of such State . . . from which they are taken.425/

The language "every court within the United States" clearly includes the federal district courts.426/ Hence, the court in Robinson should have applied res judicata and refused to hear the action if the doctrine of res judicata would have been properly applied by a state court.

It seems highly probable that the Hawaii state courts would have applied res judicata if Robinson had been filed in state instead of federal court.427/ As set forth earlier, the causes of action in McBryde and Robinson are essentially the same. If it is agreed that the constitutional validity of a state supreme court decision does not create a new cause of action, then the cause of action or "ultimate practical question"428/ in both cases was the same--namely, the determination of rights to water. Because this issue had been already once determined, the doctrine of res judicata would have been invoked by the Hawaii state courts to prevent relitigation.

The Robinson court justifies its refusal to apply res judicata on the grounds that the result reached in McBryde was totally "unexpected."429/ However, the decision to apply res judicata is not to be measured by the nature of the decision reached, but rather by the congruence of the parties involved and causes of action which are asserted.430/

Furthermore, it might be argued that res judicata need not apply because the parties in Robinson and McBryde were different. This argument has also been discussed earlier.431/ The addition in Robinson of state officials charged with the enforcement of the decision does not change the real nature of the action. It is not an original action but a disguised appeal from a state supreme court decision. The "new" defendants are not really "new" because they were implicitly involved in McBryde to the extent that they were responsible for enforcing the decision. Moreover, courts have steadily moved away from a strict requirement that all parties be the same in order that res judicata be applied.432/

Lastly, an argument might be made in defense of the Robinson decision that a second action filed in federal court asserting the deprivation of a civil right under 42 U.S.C. sec. 1983 should constitute an exception to the res judicata requirement. Section 1983 provides legal and equitable redress for deprivations of federal constitutional or statutory civil rights by persons acting under color of state law.433/ The asserted constitutional violation in Robinson was that the McBryde decision "took" petitioners property in violation of the fifth amendment.

If it is agreed that decisions cannot "take" property, then, this cause of action affords no basis for a Section 1983 claim. Moreover, although the United States Supreme Court has not ruled in the question of whether a Section 1983 claim constitutes an exception to res judicata,434/ the vast majority of the federal appeals courts have ruled that it does not.435/ The Robinson court attempts to distinguish this

line of cases on the grounds that the litigants could not have anticipated and therefore, could not have raised the Section 1983 claims.^{436/} The court argued that the McBryde decision created the Section 1983 claim and thus, in Robinson, petitioners were raising that claim at the first possible opportunity. However, this justification crumbles if one agrees with the analysis that a decision cannot "take" property. If a decision could "take" property, then each decision that allegedly "took" property or was in some manner unexpected, could be relitigated despite the doctrine of res judicata.

If this were so, the appellate process would be undermined because every unexpected state (or federal) trial court decision could be relitigated in federal (or state) court. Litigants would have no need to follow the appropriate path of appeal to each higher court. The absurdity of this situation results from the original premise that courts can "take" property.

At this point, it should be acknowledged that the manner in which courts act through their decisions may have all the effects and ramifications of a "taking," in the sense that property formerly "belonging" to one person is no longer in that person's possession. However, words have whatever meanings one chooses to assign to them. We could certainly agree to say that courts can "take." However, the consequences of assigning courts the ability to "take" would be to reduce the judicial process to shambles. For practical and theoretical considerations, we must conclude that it is better to say that courts cannot "take."

There is no inherently "true" answer to the question whether courts can "take." But if we examine the consequences of a decision to include courts within the "taking" provision of the fifth amendment, as this section has attempted to do, we see that those consequences are devastating to our judicial system and in conflict with our philosophical approach to the manner in which courts act.

The only reason the Robinson court felt obliged to say that "courts can take" was to preserve another valued principle--that property cannot be "taken" by government without just compensation. However, as will be discussed later, it is not necessary to assert that courts can "take" in order to preserve this principle.

Summary.

Three reasons have been offered for predicting a reversal of Robinson. The first two arguments assert that the federal district court had no jurisdiction or power to hear the case. It lacked this jurisdiction on the grounds that it had no power to act directly or indirectly as an appellate court of the state and that no substantial federal question had been presented to the court. Finally, the Robinson court, because of the doctrine of res judicata, should have chosen to bar relitigation of essentially the same cause of action asserted in McBryde.

Sotomura v. County of Hawaii

On October 16, 1978, the United States District Court for the District of Hawaii issued its opinion in Sotomura v. County of Hawaii,^{437/} a case that raises many of the same issues addressed in Robinson. Because of the similar procedural context of the two cases, some discussion of Sotomura is needed here.

The County of Hawaii began a condemnation action in July, 1970, to purchase the Sotomuras' beachfront property for inclusion in a new public park. The Sotomuras' property had been registered with the land court in 1962, and the seaward boundary of the land was fixed by decree of the land court at the seaweed line, according to the practice at that date.

The trial judge determined that some erosion had occurred since registration. To locate the current seaward boundary of the land, the trial judge applied the rule set down in In re Ashford,^{438/} that the seaward boundary of unregistered land was the upper reaches of the wash of the waves, the so-called "debris" line. On appeal, the Supreme Court of Hawaii held that the seaward boundaries of the Sotomuras' property was to be measured by the "vegetation" line, a line farther inland from the trial court's determination. The "vegetation" line was approximately 43 feet inland from the "seaweed" line where the boundary had been set by the land court at the time of registration; the "debris" line was 27 feet inland from the seaweed line.

In essence, the Hawaii Supreme Court had retroactively changed the definition of the high water mark. Their decision was justified by reference to earlier Hawaiian customs and was supported by reasoning that is persuasive to many. Regardless of the merits of the decision, however, a change in property law occurred leading to a federal claim that the court had "taken" property. In the lower court proceeding, the high water mark was measured by the line where the debris could be found on the beach. The Supreme Court held that the high water mark was measured by the vegetation line. This re-definition by the Hawaii Supreme Court of the high water mark deprived the landowners of property valued at \$37,000.

The Sotomuras petitioned for a rehearing before the Hawaii Supreme Court. The rehearing was denied.^{439/} Subsequently, the Sotomuras sought review in the Supreme Court of the United States, which was also denied.^{440/}

Thereafter, as in Robinson, the Sotomuras filed an action in federal court alleging that the decision of the Hawaii Supreme Court was a "taking" of their property in violation of the Fifth Amendment. In October of 1978, the federal district court, Judge Dick Yin Hong, issued its opinion agreeing with the Sotomuras' contentions. The Court in its conclusions stated:

The Hawaii Supreme Court's retroactive application of Ashford standards to locate the seaward boundary of the property at the vegetation line, following erosion, ignoring vested property rights and without determining the extent of actual erosion, was so radical a departure from prior state laws as to constitute a taking of the Owner's property by the State of Hawaii without just compensation in violation of rights secured them by the Fourteenth Amendment to the United States Constitution.441/

Thus, the two major issues present in Robinson also exist in Sotomura. First is the question of whether the action brought in federal court was an improper appeal of a state supreme court decision. The Sotomuras clearly were seeking a reversal of the state supreme court's decision. As in Robinson, the validity of the federal court's intervention rests wholly on the assertion that the state supreme court, through its decision, "took" the property of the Sotomuras. As in Robinson the conclusion that a court can substantively "take" property was based on Justice Stewart's concurring opinion in Hughes v. Washington.442/

The second major question in Sotomura, as in Robinson, is whether the federal district court should have avoided this controversy because of the doctrine of res judicata. In its conclusion, the court stated:

The claims of the Owners in this action were not litigated and could not have been litigated in the Third Circuit Court, State of Hawaii, or in the Hawaii Supreme Court, absent a granting of the Petition for Rehearing, and are not barred by the doctrine of res judicata. (Scoggin v. Schunk, 522 F.2d 436 (9th Cir. 1975), cited by defendants is clearly distinguishable.)

In essence, as in Robinson, the court stated that the "taking" of property by the state supreme court was a new cause of action which arose out of the decision itself. Because this cause of action was a new one, it could not have been raised before and thus was not barred by the doctrine of res judicata. The validity of this view rests upon the conclusion that an unexpected decision of a state court can create a "taking" cause of action.

The most significant difference between Robinson and Sotomura is the federal court's conclusion in Sotomura that the failure of the state court to give res judicata effect to the land court decree was a denial of the substantive protection of the due process clause. This conclusion raises the issue of whether the federal constitution limits the ability of state courts to fashion state res judicata law. Such law has

been traditionally a matter of state concern. The question is whether the departure from a settled rule about when res judicata applies is a denial of due process in violation of the federal constitution.

Arguably, the improper application of res judicata to bar a claim and deprive a litigant of his or her day in court would be a denial of procedural due process.443/ The remedy would be to grant the litigant a day in court. On the other hand, the failure to apply res judicata or collateral estoppel to bar litigation on a claim or issue of fact which, in effect, would give a party an unexpected chance to litigate an issue would not be a violation of procedural due process to the adverse party. No party was deprived of a previous right to a hearing or right to litigate an issue. This situation is what occurred in Sotomura. A party, in this case the State, was the unsuspecting beneficiary of the right to open an issue once thought resolved--namely, the demarcation of the high water mark. Thus, an unexpected change in the law of res judicata which unexpectedly opens the right to relitigate an issue (as opposed to an unexpected decision which closes the door on an opportunity to be heard) does not violate the Brinkerhoff-Faris 444/ requirement of a fair opportunity to be heard.

Moreover, so long as one agrees that courts cannot "take" property, the unexpected decision to stop giving res judicata effect to land court decrees does not raise a substantial federal question.

Thus, in conclusion, Sotomura and Robinson are largely based on the same reasoning. In both cases, the opinions significantly leave out any discussion of the Rooker doctrine 445/ and the applicability of 28 U.S.C. sec. 1738,446/ and their failure to resolve these issues raises a strong possibility of reversal.

The Impact of McBryde

If Robinson is overturned by the U.S. Court of Appeals for the Ninth Circuit, then McBryde becomes the controlling judicial decision governing water law in Hawaii. Our task would then become one of interpreting what McBryde means and determining what impact it will have on possible legislative action in the area of water management. The McBryde decision is significant because of two particular rulings--that the private landowners cannot transport water from one watershed to another and that the State is the owner of the surplus water.

Transportation of Water.

Many have wondered about the effect of the language in McBryde that states that the private landowners may not transport water from one watershed to another. Indeed, representatives of the sugar industry have pointed out that if this ruling is fully enforced, irrigation to the sugar fields in the dry parts of the islands will be terminated and the industry will collapse. Undoubtedly, the construction of further irrigation projects and the purchase and sale of water rights and land claiming such rights has been paralyzed because of this uncertainty.447/

First, we should be clear on what the court actually says. The McBryde majority does not state that water can never be transported out of its original watershed area. The court holds only that the private landowners cannot transport water out of the Hanapepe Valley because their water rights are appurtenant and riparian rights which are limited to use within the original watershed.^{448/} The majority opinion also holds that, because the early Hawaiian statutes were designed to bring the riparian doctrine to Hawaii, no landowner can divert water to the injury of other landowners who "are entitled to have the flow of water in the Hanapepe River in the shape and size given it by nature."^{449/} The court based these rulings on two early Hawaiian statutes ^{450/} and invited the legislature "to conduct a thorough re-examination of the area."^{451/} The legislature could, therefore, amend these rulings.

The court's statement that the private landowners cannot transport water is also possibly open to question, because this issue was not before the court and so the court's statements are "dicta" rather than a binding "holding." The impact of a court's statement on an issue depends on whether the statement is considered part of the holding of the case. Was this statement necessary for the judgment at issue, or merely dicta, a kind of off-hand pronouncement by the court?^{452/} The question at issue in McBryde was who owned the surplus water. Were the issues of the severability of water rights and transportability of water necessary for a determination of the "ownership" of water? It appears that a determination of the ownership question would not first require a determination of whether water may be transported from one watershed to another.

For example, if landowner A asserts an easement right over the property of his neighbor landowner B, suppose the court, after ruling that landowner A does have such an easement right, were to say that landowner A could not transfer that easement right to another party. Suppose, also, that this statement regarding transfer is the first such expression in the jurisdiction. How would one classify the effect of this statement? Because it does not appear to be a necessary issue to resolve prior to a resolution of the issue of ownership, it would appear to be dicta. In other words, it is merely predictive of how the court is likely to act in a case properly brought before it, where transfer of an easement right is at issue.

Although a later court can overrule a holding (the rule of the case) just as it can ignore a statement that is dicta, it is generally agreed that dicta is accorded much less deference. Dicta regarding the transfer of water is merely predictive of how the court is likely to act in much the same manner as a law review article authored by a judge is predictive. Dicta is a notice of the possibility of change in a legal doctrine.

The McBryde majority's statement on the transportability of water is thus indicative of possible future changes, but does not constitute a present change in the law. The possibility that this change will become a reality is subject to various factors, such as changes in the

composition of the court and persuasive arguments presented in the legal literature before the court addresses this issue directly. Certainly, it can be agreed that the statement does not operate in the same manner as a criminal statute granting the State the power to jail or fine those who transport water.

It seems that all that can be presently determined regarding this statement is that, assuming the predilection of the Hawaii Supreme Court remains the same as it was at the time of the McBryde decision, the court is likely to rule, given a properly presented case, that certain as yet undefined parties can prevent the transportation of water out of the watershed by other parties.

However, it is also clear that the situation has not remained the same as it was at the time of the McBryde decision. The composition of the court has changed. Justice Abe, who authored McBryde, is no longer on the court. Two new justices will join the court in 1979. Moreover, many commentators have expressed concern about the adverse economic impact of a ruling prohibiting all transfer of water. Thus, the critical question is the probability of a newly constituted court accepting the suggestion in McBryde that water cannot be transported from one watershed to another.

Some may fault the court for not making it clear whether or not the ruling was dicta. However, traditionally, courts have not taken it upon themselves to distinguish self-consciously between dicta and the rule of the case in their decisions. What constitutes dicta is not something which the court has any control over. A court could not pronounce new rules not related to the issue presented and by mere declaration magically change them from dicta into part of the holding. The essential function of courts is to render judgments, not write opinions. Moreover, opinions do not "create" law, they really only indicate to us the likely judgments of a court in the future as to certain fact situations. The real difference between a holding and dicta is that a holding is much more predictive of the future than is dicta.

Thus, if it can be agreed that the transportability ruling is more suggestive than self-executing, it should not inhibit the legislature from considering this question directly. Although the State could decide to restrict transportability, it is difficult to envision any water management system which would, as a permanent feature, prevent all transportation of water.

If the Hawaii Supreme Court were to follow its suggestion in McBryde regarding transportability in a future case, the legislature would still have the power to overrule such a decision and permit transfer, because the court has rested its view on earlier statutes.^{453/} Once the legislature acts, it will then provide the guidance that has been missing. It can clarify the earlier statutes or substitute new guidelines. The problem so far has been that the state supreme court has been compelled, because of its responsibility in resolving disputes, to create a system of water law with no legislative guidance.

State "Ownership" of Water.

The fundamental reason for the confusion following McBryde has been an inability to agree on what the majority meant when they spoke of "state ownership" of the surplus waters. The term "ownership" has been assigned a number of different meanings when used in reference to water.^{454/} In some statutes and constitutions, "state ownership" has been interpreted to mean publici juris, i.e., belonging to the state in the sense that it is the sovereign or the "representative" of the public to enforce the public interest.^{455/} Other courts have interpreted state ownership in a "public trust" sense, such that the state is the trustee of the water for the benefit of the public.^{456/} Another manner of interpreting state ownership is in a res publicae or proprietary sense, that is, ownership in the manner that the state owns the state capitol and Washington Place.^{457/}

It is this last definition that seems to cause all of the problems. Under the first two definitions, the State does not "own" the water in the sense that one owns an automobile. Rather, the State "owns" the water in the sense that it has the power of control over the water.

On the other hand, the res publicae or proprietary sense of ownership connotes a much more commonly held conception of ownership. In essence, it means "ownership" similar to the way one owns a watch or car. It is this res publicae use of the word that creates the belief that the McBryde decision caused a "taking." If the State is now the owner of the water, this newly found ownership must have displaced a previous owner.

Most states do not assert ownership over water in a res publicae sense,^{458/} because many state purposes are served by the more limited claim of "state ownership" to effectuate control and regulation.^{459/} Moreover, a court does not need to declare "state ownership" in order to grant the state the powers of control and regulation. Control and regulation can be justified under the exercise of the police powers. Thus, if "state ownership" as used in McBryde is interpreted in its most meaningful sense, as reaffirming the power of state control and regulation, then nothing was "given" to the State. It already had powers of control and regulation. It does not make sense to say that anything was "taken" from other parties.

Furthermore, although the McBryde decision does speak of "state ownership" of water, evidence indicates that the court intended to use the "public trust" connotation.^{460/} This "public trust" usage implies much more of a "control-and-regulate" usage than a res publicae usage.

If these views are accepted, the McBryde decision does not raise a "ripe" controversy regarding compensation. The declaration of "state ownership" in McBryde, if it means only that the State can control and regulate, does not take property.

The question of compensation may arise when the government does actually seek to control and regulate water. But this situation has not come about and is totally unrelated to the facts in McBryde and Robinson. The question whether such actual regulations constitute a "taking" would be measured under the same judicially promulgated tests that have been used to measure the validity of other government controls.

Thus, much of the hostility towards McBryde rests upon the belief that the court attempted, by circuitous reasoning, to deny compensation for property that had been "taken." But, no property was "taken." If the court had stated that the "state shall have the power to control and regulate surplus waters," then, there would have been no controversy. Instead, it is the use of the term "state ownership" that caused much of the confusion.

If the McBryde decision is reviewed in this light, it does not appear to be a drastic or radical decision. At most, the court may be guilty of avoiding one of the questions presented to it. It is as if the court, when asked to determine whether a party "A" had acquired prescriptive rights from "B," had replied, "no, neither A nor B has such rights because the state has the power to control and regulate the property." The second part of the statement does not answer the question initially posed. If the result is that neither A nor B may take water, then the justification that the state may control water is not an answer and does not necessarily follow. For example, under its power to control and regulate, the state may actually determine that it is a valid practice for A or B to take water from the stream.

The critical point is that if the state had prevented A or B from taking water out of the stream, then the case would be "ripe" for a determination of whether a "taking" had occurred. It does not matter whether the justification for preventing A or B from taking water rested on the power to regulate under the police powers or rested upon the McBryde decision's declaration of state control. Whether or not such government action constituted a "taking" would be measured under the traditional tests.^{461/}

McBryde may thus have very little impact on future legislative action. If "state ownership" is interpreted to mean "control or regulation," then the State really did not receive any new power that it did not already possess by virtue of the police powers. Hence, new water legislation would not conflict with the ruling in McBryde.

If, on the other hand, Robinson is affirmed on appeal and the McBryde decision is effectively "voided," then, the state of the law is returned to the situation that existed prior to McBryde. The major cases before McBryde did sanction private ownership of water.^{462/} However, the State would still have the inherent power to control and regulate water. Hence, these "private waters" would not be beyond control by the State even though such control might eventually require compensation.

Conclusion

Although it does seem, for the three major reasons set forth earlier, that Robinson will be reversed on appeal, the effect of a reversal or even of an affirmance may not have a major impact on the future course of water management.

Even in the event of reversal, the McBryde decision may not lessen the obligation to pay compensation if property rights are deemed to have been taken by government regulation. Moreover, the power and inherent authority of the State to regulate water was neither enlarged nor reduced by McBryde. The statement of the court in McBryde that water may not be transported is merely predictive of a future ruling by the court. The likelihood of such a ruling may have lessened because of changes in the composition of the court and substantial comment on the adverse impact of such a ruling.

It appears that the real lessons to be learned from McBryde and Robinson concern the nature of the judicial process. As to Robinson, it is important that the theory that courts can "take" property be discredited. Affirmance of Robinson would constitute a large step towards undermining the state judicial process. As to McBryde, perhaps the lesson to be learned is that judicial language does not always mean what it purports to convey and that the impact of judicial language must be interpreted in light of the functions a court performs.

THE WATER RIGHTS SYSTEMS OF OTHER STATES

Introduction

Many other states have experienced controversies over water rights, and Hawaii's current disputes can be better understood by comparing the situation here to those of other states. This section focuses on the water systems of nine western states (Alaska, Arizona, California, Colorado, Montana, Nevada, New Mexico, Texas, and Wyoming), which were chosen because their experiences and problems parallel those of Hawaii in some way. Examples are offered from other states as well, to illustrate innovative approaches that are relevant to Hawaii.

The fresh water resources of the nine selected states are economically or physically scarce. As a result, water law is an important part of their legal tradition. These selected states represent both "generally more arid" and "generally less arid" conditions. Consequently, their laws and practices portray a variety of options regarding: (1) conceptualizing and expressing state or public dominion over inland waters; (2) taking private water rights for public or private uses; (3) utilizing the courts to formulate water rights policies; and

(4) creating organizational and administrative structures to regulate, control, and adjudicate water rights.

The Ownership Concept

State constitutions and statutes differ in their manner of asserting and expressing state or public ownership concepts. Some states assert that water is the property of the state. Others assert that waters are the public's property, held in trust by the state. Still other states avoid the "ownership" concept by asserting the state's right to regulate and control water use.

The exact language chosen is rarely crucial, but two different conceptions of state "ownership" can be identified. The basic difference involves viewing the state (1) as the owner of the corpus (physical substance) of the water in the res publicae or proprietary sense of having exclusive title, or (2) as the possessor of a sovereign right which empowers it to carry out its proper functions by regulating private water use for the common benefit of the people (publici juris). In general, most commentators have felt that the corpus of freely flowing water is not anyone's property because no one can possess running water, and possession is generally an essential legal element of ownership. The right to use water, however, can be and generally is treated as property. Therefore, the only practical function of constitutional or statutory declarations of ownership, in whatever form, is to lay a foundation for control and management of this resource.

A few examples can illustrate this treatment. Wyoming drafted its constitutional provisions on water rights while it was a territory, and these provisions remain the basis for the present system of water management. One provision states unequivocally that all waters are the state's property:

The water of all natural streams, springs, lakes or other collections of still water, within the boundaries of the state, are hereby declared to be the property of the state.^{463/}

Another provision provides that:

Priority of appropriation for beneficial uses shall give the better right. No appropriation shall be denied except when such denial is demanded by the public interest.^{464/} (An "appropriation" system is described later in this text, pages 222-26.)

The Supreme Court of Wyoming interpreted these constitutional provisions as an affirmation that state "ownership" is in the nature of a sovereign, not a proprietor.^{465/} In a more recent case, the court stated:

The state holds the water merely as trustee for the public and not in a proprietary capacity.^{466/}

Montana and Texas have constitutional and statutory provisions that are similarly worded.^{467/} Again the state supreme courts rejected the res publicae, proprietary, or possessory ownership concept and ruled that ownership is only in the publici juris sense of sovereignty.^{468/}

The constitutions and statutes of Arizona, Colorado, Nevada, and New Mexico also state that all waters are the property of the public.^{469/} These four states all permit private use of water under systems of appropriation, which are described below. Alaska constitutionally requires the legislature to maximize the benefit, to the people, of natural resources that are for common use.^{470/} The California Constitution explicitly spells out the view that prevails in most Western states:

The use of all water now appropriated, or that may hereafter be appropriated, for sale, rental, or distribution, is hereby declared to be a public use, and subject to the regulation and control of the State, in the manner to be prescribed by law.^{471/}

The Acquisition of Private Water Rights - Legal Doctrines

States exercise their powers of control and regulation by first adopting a legal doctrine governing the acquisition of private water rights and then legislating procedures to govern such acquisitions. Courts and legislatures have focused on two legal doctrines, "riparianism" and "appropriation," although none of the selected Western states now has an exclusively riparian system.

Riparianism.

Riparianism is a common law system originating in England and utilized in many of the Eastern states of the United States where water is abundant.^{472/} Its principal feature is that rights in water arise from, and only from, ownership of land which adjoins a watercourse. The riparian right is a right to use the water, but the riparian landowner does not "own" the water.^{473/} The right cannot be destroyed by nonuse of the water, but it is generally limited to "reasonable" use with respect to the rights of others in the watercourse.^{474/} Reasonable use may be determined by apportioning quantities, by giving one type of use preference over others, or by giving priority to an established use over a proposed new use.^{475/} The reasonable use theory assumes the right to

divert a reasonable amount of water from the natural streambed but demands that water diverted and unused be returned to the streambed.^{476/}

Diversion of the waters in riparian systems is subject to two restrictions. First, some jurisdictions restrict use of the water to the riparian lands. California courts have generally held to this view. In one of the first cases exemplifying this philosophy, the California Supreme Court prohibited a riparian proprietor from transporting water for irrigation to a noncontiguous and non-riparian land parcel that he also owned.^{477/} By contrast, the Supreme Court of Texas has taken the position that although the general rule constrains water use to riparian lands, its use on non-riparian lands will be permitted where water is abundant and no possible injury to other users will result.^{478/}

The second restriction upon riparian diversion that is more generally followed precludes diversion of water from the watershed of a stream.^{479/} This rule is based upon a long-standing property theory that "where water is used on such land, it will, after such use return to the stream, so far as it is not consumed, and that, as the rainfall on such land feeds the stream, the land is in consequence entitled, so to speak, to the use of its waters."^{480/}

Some riparian states--even in water abundant regions in the East--have begun to regulate riparian uses and issue permits for new uses. In New York, for instance, existing riparian uses are protected and preserved without any permit requirements, but new riparian water users must obtain permits before they can take water from streams. Non-riparian water uses can also be acquired through permit systems similar to those described below.^{481/}

Permits are usually administered by a central state agency and are usually issued for fixed terms. Depending on the administrative agency's opinion of the water situation at the end of the permit period, permits may or may not be renewed or extended. In some states, permits may be cancelled at any time when the administrative agency feels that such cancellation would best serve the public interest. However, before such cancellation becomes effective, notice is given to the permit holder and hearings are held.^{482/}

Florida's 1972 Water Resources Act, for instance, states that permits are issued for a period of time not to exceed twenty years, depending on the water source and type of use, or both. Permits may, however, be issued for up to fifty years if the applicant is a government body or public works corporation, or if the extended time is necessary for the retirement of bonds to be issued to finance construction of waterworks or waste disposal facilities.^{483/} Permits may be renewed or modified prior to renewal. Revocation of permits can occur for a number of reasons including false statements on applications, willful violation of permit conditions or provisions of the act, nonuse of the water, and voluntary consent of the permittee.^{484/} During emergencies resulting from water shortage, permits are subject to special limitations.^{485/}

In New Jersey, a permit is granted upon conditions that the administrative agency deems necessary to protect the public interest.^{486/} All permits are limited for a period of up to twenty-five years ^{487/} and are not transferrable except upon approval of the administrative agency.^{488/} All permit users are required to pay an annual charge to the state for the right to divert surface waters. These charges are fixed by statute and are based on the amount of water diverted.^{489/}

A major distinction between riparian rights and appropriation rights is that in contrast to the "first in time is first in right" concept among appropriators, no riparian owner can claim a superior right based merely on prior use of the water. The use of the stream belongs to all owners and is divided equally among them if the water is sufficient for all owners using it.^{490/} In actual practice, however, prior uses are often protected.^{491/} Also, a riparian owner's right is not limited to any specific amount of water but is, as noted earlier, defined only in terms of reasonable use.^{492/}

Appropriation.

The essence of the appropriation system is that all water is available for use by anyone who can apply it to beneficial use. The first person to initiate a use has the first or prior right over all subsequent users, providing the use remains beneficial. The early water uses in the West began before any legal doctrines governed such use. The early miners and farmers settled in areas where water was available and simply diverted and used water as their needs required. Because few courts and no established water law doctrines existed during that period, early water users operated in accordance with rules and customs which they developed to control water use practices in their respective areas. It was during this early period that many Western areas rejected the riparian rights doctrine as incompatible with successful development and settlement, because under the riparian rights system water in streams could be used only by the riparian owner, which usually was the federal government. The local courts, therefore, decreed that riparian rights would not be recognized and that water could be diverted from a stream as long as it was put to beneficial use.^{493/}

The doctrine of "prior appropriation" is recognized in the appropriation states, which means simply that water users are given priority as of the date when the use first commenced, so that each user has a right which is superior to later users but inferior to all earlier users. In times of shortage, or when a stream is "over appropriated," the owner of the oldest water right is first entitled to have his or her right satisfied in full before subsequent users are entitled to any water. All appropriators, however, are limited by the requirement that they keep their water in a beneficial use.^{494/} The Colorado Constitution, for instance, recognizes that between those using water for the same purpose, priority of appropriation gives the better right. Appropriators are entitled to have water distributed to them according to their priorities as established by judicial decrees.^{495/}

In an appropriation system, one acquires under a procedure provided by state law a right to divert a specific quantity of water from a public water supply (provided that it is available in excess of the requirements of existing vested rights) and to apply such water to a specific beneficial use. All nine selected Western states have statutory procedures for appropriation under the control and supervision of state administrative officials or agencies, most commonly a state water engineer. The following model of an appropriation system describes in general terms the system used in our selected states,^{496/} except for Colorado and Montana:

- (1) The applicant submits a request for a desired quantity of water specifying the intended use and the place and method of diversion.
- (2) The authority responsible for deciding whether to grant such request notifies other state agencies charged with responsibility for conservation, resource planning, wildlife management, etc., and also notifies private parties that may have an interest in the application.
- (3) Objections may be filed and hearings held.
- (4) The deciding authority evaluates all facts submitted to determine if the use is beneficial, if the public interest would be served by the intended use, and if the project is feasible. In several states, general evaluation criteria are specified in statutes (see below, pages 227-29).
- (5) A permit to proceed with the proposed diversion may be issued or denied. The state engineer may grant a permit for a smaller amount of water than applied for or may vary the periods of annual use of the water. If the application is denied altogether or in part, the applicant may apply to the court for judicial review.
- (6) Construction of the diversion facility must commence within a reasonable time and proceed at a reasonable rate.
- (7) Upon completion of the facility and the application of the water to use, the permit granting authority reviews the project to determine if it complies with the terms of the permit.

- (8) The deciding authority issues a certificate of appropriation if the facility and use comply with the terms of the permit.
- (9) The right of use continues until the beneficial use ceases to exist or the right is lost by actions of the appropriator or by action of law as described later in this text.

Most statutes prescribe the criteria for issuing water permits in terms that are very general, leaving substantial discretion to the administrators. Examples of such criteria, "preferences," or priorities are given below, pages 227-29.

Colorado and Montana give their courts a greater role in dividing up their waters than the other Western states we have focused on. In Colorado, the state engineer, who is also the head of the division of natural resources, shares responsibility with the judiciary for water administration and control. Administrative matters and technical advice are the responsibilities of the state engineer and the seven water engineers who serve in the seven water districts which correspond roughly to the major drainage basins of the state. For each district, a "water judge" is selected from among the state court judges to determine the amounts and priorities of applications for water appropriation. The judge may be aided by an appointed water referee.^{497/}

Montana divides its waters into "adjudicated" and "unadjudicated." Adjudicated waters are those that have been considered by a court in the past; an appropriator seeking these waters files a permit application with the court and a civil adjudication ensues. Rights in unadjudicated waters may be acquired non-statutorily by merely diverting the water and applying it to beneficial use. Or, rights can be acquired statutorily by posting notice of the intended diversion and use at the point of intended diversion and filing the notice with the county clerk. The statutory procedure is advantageous in that the priority of the appropriation is determined at the time the notice is filed instead of after the diversion is completed.

"Dual System" States--California and Texas.

Only California and Texas among the selected states continue to recognize the riparian doctrine concurrently with the appropriation doctrine.^{498/} In both states, referred to as "dual system" states, riparian rights have been subjected to the same restrictions as appropriated rights - reasonable, beneficial use by reasonable methods of diversion. (See the discussion regarding the changes in these states' laws later in this text, pages 234-37.) With the exception of Alaska, which legislatively converted all riparian rights to appropriated rights (discussed later on page 236) and the dual system states, the remaining six states repudiated the riparian doctrine while still territories or shortly after they attained statehood.

In Texas, rights of riparian owners to use water are incident to the ownership of land adjacent to the watercourse. Riparian rights, therefore, pass with a conveyance of the riparian land. The riparian owner, however, may divert riparian waters outside the watershed if other riparian owners are not deprived of an adequate supply.^{499/} In California, riparian rights are appurtenant to the land and are transferred by conveyance of real property.^{500/} Unless expressly stated in the conveyance, riparian rights do not pass with land which is not contiguous to the watercourse.^{501/} A riparian water right may be conveyed to non-riparian land only if no injury occurs to other riparians or if other riparians consent to the transfer.^{502/}

The exclusive method for the appropriation of water rights in both states is by acquisition of a permit from the administrative agency. As is the case in all appropriation states, beneficial use is the measure of all appropriation rights.^{503/}

California courts have decreed that between appropriators and riparians on the same watercourse, riparians in general have paramount rights,^{504/} except where the senior appropriator's permit grants first rights to use water that is beyond the reasonable needs of riparians on the watercourse.^{505/} Texas courts leaned toward recognition of the riparian doctrine in the 19th century,^{506/} but the legislature introduced an appropriation system in 1889.^{507/} Then in 1913, the Texas legislature established a policy of nonrecognition of riparian rights in any land that passed from state to private ownership after July 1, 1895. This bill included, however, provisions protecting existing riparian rights.^{508/}

Litigation has frequently involved disputes between appropriators and riparians. A major confrontation occurred in California between the riparian and appropriation doctrines in 1926, when the state supreme court upheld a riparian right against that of an appropriator, notwithstanding the wastefulness of the riparian use.^{509/} This decision prompted a constitutional amendment in 1928 that required all users of water to be "reasonably beneficial."^{510/}

Texas's early water law caused considerable debate over the existence of riparian rights with respect to the Spanish and Mexican land grants on the lower Rio Grande around the 18th and 19th centuries.^{511/} During the period of Spanish rule, the Spaniards built acequias, or community ditches, to provide the missions and colonies with water. Local regulations governed these acequias.^{512/} The central concept of water law of that period was that all water belonged to the sovereign and irrigation rights were acquired by specific grant from the sovereign.^{513/} In a 1961 court decision, the Texas Court of Civil Appeals concluded that these early grants did not carry with them appurtenant irrigation rights.^{514/} Although acknowledging that Spanish and Mexican law governed these grants at the time they were made, the court concluded that the civil law governing the navigable rivers of those two countries did not include customary riparian rights for irrigation.

A later Texas case concerned water rights to certain waters of the Rio Grande for nearly 3,000 persons whose claims were based upon riparian rights, appropriation permits, customary water rights, and so on. After years of hearings, the court adopted a complicated system of "weighted priorities" instead of adopting the usual principle that priority in the time gives priority in right among appropriators. It also recognized "equitable" riparian rights, which had no earlier precedent in Texas water law.^{515/}

Advantages of the Appropriation Doctrine.

The appropriation doctrine is frequently viewed as advantageous for arid or semi-arid states because it permits the state to control the use of water and promote its maximum use. Although courts in riparian or dual system states generally prohibit wasteful use of water, these doctrines nonetheless reduce transferability of water rights because riparian rights generally cannot be lost by nonuse. A riparian right may bar appropriation of the water for a beneficial purpose. Many view it to be an advantage of the appropriation system that courts have generally held appropriated rights to be freely severable and transferable for use on other lands if the rights of others are not compromised.^{516/}

Appropriated water rights can--as a general rule--be sold and transferred, either with the sale of the land upon which the water is used or separately. If the new owner of the water right continues the same use at the same place, the new owner needs only to register the transaction. If, however, the new owner alters the point of diversion, the place of use, or the purpose of use, change applications must be reviewed by the water rights administrator.^{517/} As previously discussed, riparian rights may be limited to the riparian lands and are generally limited to the watershed of the stream.

A third advantage of the appropriation system is that it allows the state to define priorities among beneficial uses and to apply the priorities on a case-by-case basis. This feature is discussed more fully below on pages 227-29.

Water Rights Policies Common to All Western Systems

Three policies are basic to all Western water rights law, regardless of the legal doctrine involved. They have been alluded to in the introductory description of the riparian and appropriation systems but merit individual identification. These policies are: (1) the policy of beneficial use, (2) the policy of maximum use or minimum waste, and (3) the policy of priority among beneficial uses.

Beneficial Use.

All state constitutions or water-related statutes studied require that water be put to beneficial use before an appropriation will

be allowed.^{518/} California has extended this requirement to riparian rights as well.^{519/} As discussed more fully in a later section regarding changes in the law, Texas legislatively restricted riparian beneficial use to domestic and stock watering purposes.^{520/}

Maximum Use or Minimum Waste.

The maximum use policy is expressed in several forms. The first is by constitutional or statutory mandates that no appropriation request will be denied unless the use contemplated is against the public interest. The constitutions of Wyoming and Colorado, in the interest of encouraging use, contain such a provision.^{521/} A second form is to provide legislatively (a) that water rights do not include the right to waste water, (b) that the state may act administratively or judicially to prevent wasteful or unreasonable use, or (c) that waste is a criminal act.^{522/} In addition, the courts emphasize these policies in their decisions.

It is the policy, not only of the Supreme Court of Montana, but of all Western states, to recognize the highest and greatest possible duty from the waters of the state in the interests of agriculture and other beneficial purposes.^{523/}

It is an obvious proposition that development of all state resources - industrial, agricultural, residential, power and the like - depends largely on the fullest use of the water resources of the state.^{524/}

Priorities Among Beneficial Uses.

State policies regarding priorities among beneficial uses are also expressed in constitutions, statutes, and court decisions. The Colorado constitution provides that domestic use is paramount, followed by irrigation.^{525/} The Idaho constitution similarly gives preference to domestic water users over other water users in times of shortage, followed by agricultural uses.^{526/} Arizona statutes assign priority to domestic and municipal use, followed by irrigation and stock watering, power, mining, recreation, and wildlife.^{527/}

The statutes of Texas similarly state that when two or more applications conflict for the use of available water, preference should be given to domestic and municipal use over all other uses.^{528/} The Texas Supreme Court expanded on the statutory guide by stating that irrigation must be given priority lest certain areas become useless; the court thus favored a person seeking water for irrigation over another who had applied earlier, seeking the water for power.^{529/} (When water has already been appropriated for a beneficial use, however, a claim for a state-defined higher priority use is generally limited by the requirement of payment of just compensation to the prior user for the taking and related damages.)^{530/} Wyoming recognizes preferred uses which

include rights for domestic and transportation purposes, steam power plants, and industrial purposes.^{531/}

Alaska offers an example of one of the most detailed statutory provisions governing water permits:

- (a) The commissioner shall issue a permit if he finds that
 - (1) rights of a prior appropriator will not be unduly affected;
 - (2) the proposed means of diversion or construction are adequate;
 - (3) the proposed use of water is beneficial; and
 - (4) the proposed appropriation is in the public interest.
- (b) In determining the public interest, the commissioner shall consider
 - (1) the benefit to the applicant resulting from the proposed appropriation;
 - (2) the effect of the economic activity resulting from the proposed appropriation;
 - (3) the effect on fish and game resources and on public recreational opportunities;
 - (4) the effect on public health;
 - (5) the effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation;
 - (6) harm to other persons resulting from the proposed appropriation;
 - (7) the intent and ability of the applicant to complete the appropriation; and
 - (8) the effect upon access to navigable or public waters.^{532/}

These criteria, although not expressed in terms of priorities or preferences, give the decision-maker more guidance than the statutes of most other states.

Other Common Water Regulation Techniques

Rotation.

Water use rotation by alternating periods of use among users is another method of maximizing beneficial use of water. The practice was historically employed to settle disputes among riparian owners using water for irrigation, but the Supreme Court of California saw no reason the concept could not also be applied to regulate claims by appropriation. In a 1912 case, an irrigation ditch no longer carried sufficient water volume to provide each of two appropriators with the volumes specified in their respective appropriations. The court's solution was to fix the times when the entire ditch flow could be used by each party. The duration of use was allocated in proportion to respective rights of the appropriators as represented by the volume of water granted in each appropriation.^{533/} Arizona, Wyoming, and Nevada have statutes permitting such rotation agreements to be made privately without court intervention.^{534/}

Local Water Management Organizations.

All states examined, through constitutional or statutory enactments, have provided for the creation of public water supply, conservation, reclamation, water management, irrigation, flood control, or similarly named districts and for the licensing of private municipal water supply and irrigation companies. Each water district is created or licensed by a separate enabling act and is presided over by an elected or appointed governing body. The objective is to provide local management and control over water use, quick response capability to changing local conditions, and local resolution of conflicts without protracted litigation in the courts. One result of the domination of local conflict resolution by these administrative bodies is that recent court decisions establishing legal water rights principles or interpreting statutes are scarce, and examples of such decisions are primarily found in very early reported cases.

These water "sub-agencies" may be created at will by the legislature in response to a request by the state head of the natural resources agency responsible for water management or by petition of a certain percentage of interested water users or suppliers. In California, these water agencies number in the hundreds, and although the powers of each differ, they may include the exercise of eminent domain; the issuance of bonds and other borrowing instruments; the issuance of capital stock; the levy of ad valorem, use, and pump taxes; the regulation of water rates; the sale and transfer of water; the administrative resolution of conflicting claims; and the assessment of users or pumpers for capital improvements.

Condemnation and Taking of Water Rights

Introduction.

Both condemnation by individuals for private rights of way and condemnation by eminent domain for public use may result in a "taking" of private water or associated land rights. Most Western states permit private individuals to condemn the private property of others for rights of way required for their own irrigation purposes on the theory that irrigation is a public use.

The Utah Supreme Court upheld the constitutionality of this procedure.^{535/} The decision was affirmed by the United States Supreme Court which noted that water rights principles in the Western states must differ markedly from those in the East because of physical differences that require enactment of laws to further the growth and prosperity of these states.^{536/} In the Utah case, a farmer refused another farmer permission to widen an irrigation ditch on the former's property so that both farms could be irrigated. The court granted the deprived farmer a condemnation order on the basis that irrigation of arid lands is a public purpose and that using water for irrigation is a public use.

The Arizona constitution sanctions such private "takings" by providing:

Private property shall not be taken for private use, except for private ways of necessity, and for drains, flumes, or ditches, on or across the lands of others for mining, agricultural, domestic, or sanitary purposes.^{537/}

The Arizona Supreme Court interpreted this provision and held that taking private property for private use was permissible in certain circumstances upon due notice, a hearing, and payment of adequate compensation.^{538/} The court emphasized that these private takings would not be permissible in Arizona in the absence of the provision in the Arizona Constitution quoted above.

The California Constitution and water code authorize public purposes condemnations, not only by the state government, but also by state and privately created municipal water, drainage, irrigation, levee, reclamation, flood control, and conservation organizations and districts.^{539/} Just compensation must be made to the condemnee, including riparian owners.^{540/}

Representative examples of takings by condemnation illustrate how this process works.

- (1) An irrigation district in California, formed to reclaim arid land as a public use, had the power to exercise eminent domain and condemn rights of

way for irrigation ditches across intervening lands of private parties upon payment of compensation.^{541/} (See examples of how just compensation has been determined later in this text.)

- (2) Periodic overflows of the San Joaquin River kept certain grasslands of downstream riparian proprietors alive and suitable for harvesting and grazing. When diversion of the river as part of the California Central Valley water plan resulted in loss of these periodic overflows, the United States Supreme Court held that a taking had occurred and that damages were payable to the riparian owners affected.^{542/}
- (3) A water storage district sought to impound periodic natural overflows and floodwaters which had previously augmented the flow of another river. The result was that riparian irrigators using water from the augmented river had less water to irrigate than they had prior to the impoundment. The California Supreme Court enjoined the impoundment because it constituted a taking of the water rights of the riparian irrigators.^{543/}

Exercise of Police Powers Distinguished from Takings.

The exercise of a state's police powers through generally applicable nondiscriminatory statutes does not require compensation. In contrast to the above cases, the California Supreme Court held in 1933 that a city and its water district could appropriate extraordinary storm and flood waters not part of the usual, ordinary, and customary flow of the stream, which were not being beneficially used by riparian owners, because these waters would otherwise be lost to the sea and wasted. In this case, the City of Santa Barbara's water supply was exhausted. The city is located on a plain abutting foothills and was not within the watershed of the stream. The city built a dam and a tunnel to divert water captured by the dam after acquiring a valid appropriation permit. The waters captured by the dam were largely the result of spring storm runoff, and much of these waters was annually lost to the sea.

The California Supreme Court held that all property is subject to the reasonable exercise of state police power, and constitutional provisions declaring that property shall not be taken without due process and just compensation has no applicability in such cases. The court thus held that the California Constitutional Amendment of 1928 (discussed more fully on pages 235-36, below), which declared that riparian owners are limited to reasonable and beneficial uses of water and are not entitled to the entire natural flow, was a valid exercise of that police power. In this case, the subject water taken from the

riparian owners had not been beneficially used by them and the appropriation by the city thus did not require compensation.544/

The police power extends, however, only to matters of general welfare or emergency and cannot be used to single out only a few or to alter pre-existing rights. An 1895 California case illustrates this distinction. A developer and a city water company attempted to employ the state police power to enjoin an upstream sawmill and small village from draining sewage, barnyard runoff, and mill waste into a stream, arguing that state water law prohibited the polluting of streams used by municipalities for public water supplies. The California Supreme Court found that the pollution was within tolerable limits for uses other than a public water supply and that the developer built his diversion facilities many years after the sawmill and village were established. The level of pollution became unlawful only because of the developer's later attempts to fulfill his commitment to the city to provide pure water from the stream. The court held that the police power will not extend to deprive a party of property rights - in this instance, the right to use a stream for drainage - even for a public use when such property can be condemned and paid for.545/

The Role of Federal Courts.

An important aspect of the condemnation and taking problem that requires emphasis is that federal courts have generally deferred to state courts to define the governing water rights law and measure the appropriate compensation when a taking does occur. An example is a case in the 1960's arising in New Mexico. A ranch company brought an action against a coal mining operator to enjoin further trespass on ranch lands and to recover damages for the operator's entry onto the ranch lands and diversion of water from a river across the ranch lands to a mine. The United States District Court dismissed the action, but the United States Court of Appeals for the Tenth Circuit reversed the dismissal reasoning that coal mining was not public in nature and hence that the ranch company had a legitimate complaint.546/ The United States Supreme Court admonished the lower federal courts for not "staying their hands" on the merits of the case, because the issue of what constitutes a public purpose for water use is of vital concern in arid New Mexico, and the issue must be decided by state courts interpreting state law. The case was remanded with instructions that the federal action be stayed.547/

A similar federal-state problem arose when the Federal Bureau of Reclamation moved the Colorado River channel to improve the river's navigability. As a result of the diversion, a landowner formerly bordering on the river was now separated from it by the lands of third parties. The federal court based its decision on state law, holding that because Arizona does not recognize the riparian doctrine, the complaining parties did not have or lose any property rights and could not claim compensation.548/

A third recent example occurred in Kansas where the state legislature converted its water rights system from riparian to appropriation,

thereby severely limiting riparian rights. A riparian proprietor of an underground stream asserted that he was unconstitutionally deprived of property rights to such waters because public officers were issuing permits to others to utilize the underground waters. The permits were issued in accordance with the state law which survived constitutional challenge in federal courts.549/ Later, the U.S. Court of Appeals for the Tenth Circuit held that a state may modify or reject the riparian doctrine but must recognize valid and existing rights. The court said that questions of ownership of water rights should be decided by local law "without any impairment by federal action."550/ The court thus upheld the state action and ruled against the riparian complainant.

Measuring Damage and Just Compensation.

A fixed value per unit of water is rarely used as a measure of damage or just compensation in condemnation and taking proceedings because of the difficulty of finding open market transactions in water under precisely the same conditions. As a result, loss of crop income or diminution in property values is the generally employed measure of damages, as illustrated in the following examples:

- (1) The State of Idaho constructed a bridge across a river and concurrently modified a highway in such a manner as to narrow the river's water-course and raise its normal level. As a result, the river periodically flooded the complainant's land and destroyed his crops. The Supreme Court of Idaho held that the state had committed a taking of property and ordered that the landowner's claim of a \$20,000 diminution in the market value of the land be tried in a condemnation proceeding.551/
- (2) A 1962 Arizona case considered the compensation due after the state condemned a strip of land and constructed a highway tunnel which diverted the underground water supply from a well and caused it to run dry. The well had supplied water to a private residence and a restaurant. The court stated that the market value of the real property actually taken and damage to adjacent property was the correct measure of compensation. Addressing the question of the now-dry well, the court held that the loss of the water supply should be considered as it affects the property value, but that it was improper to attempt to assign a separate value to the lost water itself.552/
- (3) The Nebraska Supreme Court considered the question of compensation in 1914 after an appropriator of water from a stream obstructed the stream

flow and cut off the supply that formerly had gone to his neighbor who used it for watering his cattle. The evidence showed that during this period of interference, the neighbor's cattle became thinner and their market value fell by \$800. The court held that the claimed reduction in market value of the cattle was the proper measure of damage for the loss of water.^{553/}

- (4) The Colorado Supreme Court also looked at lost profits to measure damages in a 1915 case. An irrigation company constructed its irrigation ditch in a manner that destroyed the lateral ditches by which the complainant's land was irrigated, thus destroying his crops for two years. The Colorado court held that the measure of damage was the reasonable value of the last crops over the two-year period. To determine this value, the court instructed the jury to consider all evidence regarding probable maturing of the crops, the cost of harvesting, and the probable yield.^{554/}
- (5) A California water company failed to deliver water to a subscriber for the irrigation of his lands for part of the growing season. As a result, the complainant received only one crop of alfalfa instead of the three normally harvested. The California Supreme Court concluded that the proper measure of damages was the value of the two lost crops plus costs of reseeding.^{555/}

In all these cases, water is not given a market value. Instead, the measure of damage is the lost profits or reduction in land values resulting from the loss of water.

Effects of Changes in Laws on Private Water Rights

An unexpected or rapid change in a state's statutes or constitutional provisions that abrogates previously recognized property rights can be considered a taking. A state can, however, avoid the taking problem by providing mechanisms that preserve vested rights or by implementing the change in a manner that will not cause compensable damage.

California.

California twice experienced what many viewed as significant changes in its law of water rights. In 1902, a dispute came before the California Supreme Court questioning whether landowners have the right

to draw percolating water from their land and sell it to others when such action diminishes the water available to the landowner's neighbors. The lower court ruled that a landowner does have such a right, basing its ruling on the common law doctrine of cujus est solum, ejus est usque ad inferos, or "he who owns the soil owns it to the lowest depths below." The California Supreme Court reversed, adopting a rule of correlative water rights ^{556/} similar to the doctrine adopted by the Hawaii Supreme Court in 1929.^{557/}

Corporations and municipalities that had spent vast sums of money to drill wells and distribute waters to others were outraged at this decision and demanded a rehearing. The California Supreme Court granted the rehearing, but stuck by its earlier decision that the common law rule of absolute ownership had never been firmly established in the state and that the correlative rights doctrine was the proper approach.^{558/} Even though the state's water law had arguably been changed, the state never paid any compensation to any landowner as a result of this decision.

A second and more explicit change in the law occurred in 1928 when California adopted a constitutional amendment that restricted riparian rights to standards of reasonable beneficial use and reasonable methods of diversion.^{559/} Prior to the amendment, a riparian owner was entitled to the full flow of a stream without diminution.^{560/}

The first case requiring the California Supreme Court to interpret the amendment involved an attempt by the city of Vallejo to appropriate and store storm and floodwaters of a stream, thereby depriving lower riparian owners of the full natural flow of the stream.^{561/} The court held that to determine if the city's appropriation was proper, the trial court must (1) determine whether complaining riparian owners, considering all the needs of those in the particular water field, were beneficially using the water, and then (2) determine whether a surplus exists in the water field subject to appropriation. If these facts are found, the city's appropriation is valid and may not be enjoined. However, as regards future beneficial uses which riparian owners may undertake, the appropriative right can only be deemed temporary and cannot be allowed to ripen into a prescriptive right by adverse use. (Prescription is discussed below at pages 238-39.) In this sense, a riparian right is a paramount and nonextinguishable right.

The United States Supreme Court recognized that the 1928 California amendment attempted to serve the welfare of the state by preserving but limiting both appropriative and riparian rights to beneficial use. The Court held that the amendment was a valid exercise of legislative powers and destroyed no constitutional rights, because a riparian right that was actually damaged by reason of a deprivation of water that the riparian proprietor had put to beneficial use remained compensable.^{562/}

One recent case dealing with this California amendment involved an appropriation from a stream that prevented a riparian proprietor downstream from using the water as an agent by which to expose and carry sand, gravel, and rocks. The court held that the riparian owner's use

was unreasonable, and that because the downstream owner had no property right in an unreasonable use, no taking had occurred and no compensation or injunction could be rightfully demanded.^{563/}

The two basic rules in California thus appear to be: (1) an appropriative use of water that causes damage to the paramount riparian right, considering all present and reasonably prospective beneficial uses, is an impairment of that right and entitles the riparian owner to damages or injunctive relief, and (2) if the appropriative use is not impairing a current beneficial use, the riparian's relief is limited to a declaration of his preferential and paramount right to enjoin the assertion of an adverse use which might otherwise ripen into a prescriptive right.

Alaska.

Alaska enacted the Alaska Water Use Act of 1966 to create a unified and comprehensive system for appropriation and use of water.^{564/} Prior to this enactment, riparian rights had been a cause of confusion. Landowners claimed riparian rights and courts sometimes seemed to acknowledge their existence.^{565/} Riparian rights were, however, officially recognized only in a limited context in two mining use statutes. The 1966 Act repealed these statutes and, to that extent, abolished riparian rights.

Alaska legislators dealt with this problem by converting all riparian rights to appropriative rights, which would be forfeited if the water was not put to beneficial use within five years, Alaska's statutory forfeiture period.^{566/} To date, the only reported appellate cases concerning the 1966 Act have addressed the question of what constituted a beneficial use during the periods specified in the Act.^{567/}

Texas.

The early history of Texas's water law is explained above on pages 224-26 of this section. In 1967, the Texas legislature restricted riparian rights, except for domestic and livestock purposes, to the extent of maximum actual application of water to beneficial use made during any calendar year from 1963 and 1967 or to the end of 1970 if facilities were under construction before the effective date of the act.^{568/} To date, this legislation has not been interpreted or construed by the Supreme Court of Texas or the courts of civil appeals. This statute was companion legislation to the 1967 Water Rights Adjudication Act which requires riparian owners and those who acquired claims under special irrigation acts and not by appropriation permits, to file a statement with the water commission specifying the location of the claim, the nature of its use, the date of commencement of facilities construction, and other data. Both acts are part of a vigorous program of rights cancellation inaugurated by the water commission in 1957 by legislative mandate.^{569/} The 1957 program was upheld by the Texas Supreme Court on the grounds that, although water rights are vested property interests, no one has a vested right to nonuse that is wasteful.^{570/} Under the program, nonuse for ten years allowed the court to

presume an intent to abandon the right. The ultimate goal was to destroy ancient unused riparian rights and merge the riparian system into the appropriation system.

Other States.

Other states have experienced changes in their water law over the years. Oklahoma's history is like that of Texas, and Oklahoma's legislature has gradually limited the rights of riparian owners on natural streams to domestic purposes only.^{571/} Uses beyond domestic purposes must be secured by a permit under the system generally governing appropriated rights.^{572/} Kansas shifted more completely from a riparian system to an appropriation system through legislation passed in 1945; all prior existing rights were preserved and protected, but they were limited by the beneficial use requirement.^{573/}

Oregon also followed this approach. The Oregon legislature enacted a comprehensive code in 1909 based on the appropriation system. Riparian rights were protected to the extent that they were actually used prior to the code. If riparian rights were not used for two years in a row, they were forfeited.^{574/} The Oregon courts sustained all challenges to this code and denied compensation to those whose rights were lost.^{575/}

Nevada's Supreme Court waffled back and forth during the nineteenth century on the doctrine that governed the limited water in this desert state, finally deciding that the appropriation doctrine was better suited to the conditions of the state than the riparian doctrine.^{576/}

The important element common to each state that legislatively changed its water rights law is that a period of time was provided to allow the claimant of a vested right to act to protect it.^{577/}

Loss of Rights in Watercourses

Other ways in which rights in watercourses may commonly be subject to partial or complete loss include abandonment, statutory forfeiture, prescription, estoppel, and laches. Riparian rights have been traditionally exempt from loss by abandonment or statutory forfeiture, but as discussed above, even these rights may be changed by legislative action.

Abandonment.

Abandonment is a doctrine recognized by court decisions in all of the selected states.^{578/} Alaska and Colorado statutorily recognized abandonment and its conceptual foundations.^{579/}

Abandonment requires both the act of yielding possession and the intent never to repossess. These questions of fact are to be determined from the evidence and surrounding circumstances. Nonuse may be evidence of an intent to abandon but such evidence may be rebutted by other

evidence indicating that the owner did not so intend. The essential element is voluntariness. Forced discontinuance of use has no effect. Also, in water rights law, care must be taken not to confuse abandonment of a physical facility with abandonment of a right to use water. One may discard a flume or abandon a ditch without abandoning the water right. Examples of court interpretations of circumstances evidencing abandonment follow:

- (1) Water had been appropriated to irrigate a small experimental agricultural project conducted on rented land in California. The experiment was fully accomplished, the parties had dispersed to other localities, and the only action that had been taken was to sell the ditch for \$25 two years later. The California Supreme Court held that the appropriation right was abandoned.580/
- (2) A Colorado town had not used its water right to a stream diversion for over twenty years. The town had installed a new source of water supply which was adequate and all appliances for diversion and transportation had been removed. The Colorado Supreme Court held that the appropriation right had been abandoned.581/

Statutory Forfeiture.

When the owner of an appropriated water right fails to use the water for a period prescribed by statute, the water right is forfeited and the unused water reverts to the public as unappropriated water. Unlike abandonment, forfeiture is not concerned with the intent of the owner of the water right; the fact of nonuse is sufficient. Seven of the nine selected states (Colorado and Montana are the exceptions) have forfeiture statutes. Except for Texas and California, each state has a five-year statutory forfeiture period.582/ California has a statutory period of three years.583/ Texas has merely couched a statutory forfeiture statute in "abandonment" language by stating that ten years of nonuse is conclusive indication of intent to abandon; intent is not required in statutory forfeiture.584/

Prescription.

Unlike abandonment and statutory forfeiture, loss of rights by prescription does not return the right to the available pool of appropriate rights but actually transfers ownership of the right to the adverse user. Prescription occurs when an outsider invades the possession of the rightful owner, claims title adverse to the rightful owner's claim, and continues this unlawful possession and use openly, notoriously, and continuously for a period of time specified by state law or deemed by a court to be sufficient to have perfected the prescriptive right. The rightful owner must have actual or constructive

knowledge of the adverse use. At the end of the period, if the rightful owner has not attempted to use his right or has failed to bring an action to remove the intruder, the unlawful intruder becomes the lawful owner of the right and no compensation is required. The Hawaii cases that have grappled with this doctrine are discussed above at pages 179-81.

Adjudication in the selected Western states has almost exclusively concerned whether the unlawful intruder has met all of the requirements:

- (1) Was the use an actual use of the water right? (Using seepage or overflow water would not be considered a use of the basic water right, for example.)
- (2) Was the use adverse or hostile to the rightful owner? (Did it deprive him of water when he needed it?)
- (3) Was the use open and notorious enough that the rightful owner knew or should have known of the intrusion?
- (4) Was the use exclusive - not shared with the rightful owner?
- (5) Was the use more-or-less continuous?
- (6) Did the adverse use encompass the statutory period, if provided, or was it of sufficient duration to satisfy the court that the prescriptive right should be perfected?

Alaska now statutorily forbids acquiring water rights by prescription.585/ Colorado and Montana statutorily accept the doctrine and provide required periods of adverse use.586/ The state supreme courts of Arizona, California, and Texas have allowed water rights to be acquired by prescription.587/ The state supreme courts of Nevada, New Mexico, and Wyoming have questioned whether prescriptive rights are recognized in their states. They have continued to consider individual cases in which prescriptive rights are claimed, but have not found all conditions required to perfect the right to be present in any reported claim to date. All nine states currently have statutes allowing title to land to be acquired by adverse use for periods ranging from five to eighteen years.588/

Estoppel and Laches.

Estoppel, and its close relative laches, are equitable principles that developed in courts of equity. It is therefore difficult to say that one state recognizes these principles and another state does not, because they are applied on a case-by-case basis and determined by the individual circumstances and conduct of the parties.

The loss of a water right by estoppel occurs when the lawful owner of the right is barred, because of something the owner has done or has failed to do, from asserting his title in court. Generally, the original owner must have expected that the party attempting to defeat his assertion of title would act in reliance upon the owner's representations. Generally, the owner will have been guilty of some turpitude in these representations--fraud, misrepresentation, or willful concealment of an essential fact. The second party generally (1) must have been ignorant of the nature of the "owner's" title, with no reasonable way of obtaining such knowledge, and (2) must have relied on the representations, verbal or physical, made by the owner.

Three examples illustrate how this doctrine is used:

- (1) One farmer, who had exclusive title to the water rights in the area, stood passively by and allowed another to irrigate his fields for sixteen years in the belief that he had water rights of equal priority. The farmer was estopped from subsequently denying the other's right to use water.589/
- (2) A party used an irrigation ditch for many years. The ditch was under the absolute and paramount title of the owner who acquiesced in the joint use, not only by silence, but by overt affirmative acts. The owner was estopped from subsequently denying the other's right to use the ditch.590/
- (3) The officers of an organization who stood by and allowed another organization to enlarge a ditch which they controlled, with the understanding that the second organization had acquired an interest in the ditch, were estopped to deny the right of the other organization to use the ditch.591/

Laches is distinguished from estoppel only in that the turpitude (fraud, misrepresentation, or concealment) element required in the doctrine of estoppel is replaced by inexcusable delay in asserting the owner's right.

The Utah Supreme Court summarized the equitable principles involved as follows:

Where a person with actual or constructive knowledge of the facts induces another by his words or conduct to believe that he acquiesces in or ratifies a transaction, or that he will offer no opposition thereto, and that other, in reliance on such belief, alters his position, such person is estopped from repudiating the transaction to the other's prejudice.592/

Summary

All the selected Western states and most jurisdictions throughout the country exercise considerable control over water use. Legal labels, such as "ownership" or "public trust," rarely help in describing how these systems actually work. Most states closely supervise the use of water to ensure that this important resource is being used for the maximum benefit of the states' citizens. Private parties are uniformly permitted to obtain water, insofar as supplies will allow, and most states encourage the use of water for agricultural irrigation and other activities that are economically beneficial to the community.

The riparian system of water rights has a lingering appeal in many jurisdictions because it relates the water to its neighboring land and thus promotes historical uses of water, protects the original watershed ecosystem, and frequently ensures the most logical uses for the water. The doctrine is somewhat inflexible, however, and sometimes permits precious water to be wasted or misused because neighboring landowners do not make the most of the water.

Most water-short areas have adopted the appropriation system, sometimes referred to as a permit system. Private parties who need water for crops or some other beneficial purpose request the water from a state agency; occasionally the private party is permitted to "appropriate" the water first and then perfect the claim to the water later.

Most Western states view appropriated rights as rights without a fixed duration in time, but the use of these rights is nonetheless monitored closely and the water right can revert to the state if not used for a beneficial purpose. Some states now issue water permits only for limited terms of years. Florida issues permits for from 20 to 50 years; New Jersey's permits are for 25 years.

Appropriated water rights can generally be transferred, but some states now require governmental approval for such transfer, particularly if the use of the water is changed.

Many states have changed their water laws during the past century, and the constitutional obligation to pay damages for a "taking" of property has generally been avoided by making some arrangement to protect historical rights. Some legislatures have required owners of riparian rights to register their rights and convert them into appropriated rights. The federal courts have generally deferred to the state courts in supervising the fairness of such changes, viewing water law as within the state court's jurisdiction over property. When compensation has been required for deprivations of water, the damages have been measured by the lost profits or reductions in land value caused by the loss of water rather than by the market value of the water itself.

THE LAW GOVERNING "TAKINGS" OF PROPERTY IN HAWAII

Introduction

The Hawaii Supreme Court ruled in its Hanapepe Valley decision 593/ that nineteenth century Hawaiian statutes did not permit the king to transfer water rights to "surplus" waters with transfers of land. Under the court's view, the private landowners never owned water rights to the "surplus" waters and because they never had these rights, no property was taken from them. Dissenting Justice Bernard Levinson 594/ and U.S. District Judge Martin Pence 595/ both felt, however, that the private landowners did "own" rights to the "surplus" waters which were unconstitutionally taken from them by the majority's decision. Under their view, the state must pay "just compensation" before it can obtain these water rights.

The analysis contained on pages 194-218 of this report concludes that the view of the Hawaii Supreme Court's majority is a good faith attempt to sort out confusing sources of law and that the federal district court's intervention will probably be reversed because of procedural reasons related to our dual federal-state court systems. "Taking" law is, however, somewhat unpredictable, and it is difficult to know with confidence what an appellate court might do.

The general contours of the law on takings, along with references to recent texts on the subject, are contained in the 1977 booklet of the Hawaii Institute for Management and Analysis in Government on Growth Management Issues in Hawaii.596/ This section summarizes the recent Hawaii cases on the subject to provide a guide to what compensation might be required if the appellate courts do determine that a taking has occurred.

One 1978 decision of the U.S. Court of Appeals for the Ninth Circuit illustrates the unpredictability of the law in this area, particularly where issues of public access or the public trust are involved. In the case of United States v. Kaiser Aetna,597/ the court ruled that no compensation was due to the private owners of Hawaii-Kai Marina (formerly Kuapa Pond) even though the "private" marina had to be made available to public access and use.

Kuapa Pond, originally a privately-owned fish pond, was converted into a navigable marina by the developers of the Hawaii Kai subdivision on Oahu. The United States brought an action seeking a declaratory judgment that the waters of the marina were "navigable waters of the United States" and that the public had access to these waters. U.S. District Judge Martin Pence ruled that the waters were in fact "navigable" and that the United States had jurisdiction over the waters to prevent interference or obstruction to navigation.598/ He also ruled, however, that the United States "cannot impose a public navigation servitude upon such a privately constructed waterway without paying a reasonable compensation for the use thereof."599/

The appellate court reversed the requirement of compensation, holding simply that

[T]he federal navigational servitude and the public right of use are not imposed or appropriated by action of the government in the nature of seizure. They exist as characteristics of all navigable waters of the United States.600/

The fact that Kaiser Aetna once had a private body of water and no longer has private jurisdiction over that water was not important to the appellate court. The nature of the water determined the right of the public to use the water.

Although the analogy to the surface waters involved in the Hanapepe Valley litigation is not exact, the Hawaii Supreme Court also ruled that the nature of these waters determined the rights of the public to use the water. The Kaiser Aetna case at least indicates that the U.S. Court of Appeals for the Ninth Circuit is not unfamiliar with or unsympathetic to such an approach.

The decisions of the Hawaii Supreme Court that have addressed directly the questions of "takings" and the compensation requirement have involved fact situations far removed from water rights. Usually they have involved changes in zoning laws that have affected developments on private property. If the federal courts conclude that compensation is required in the water situation, however, these precedents may provide guides for determining the manner in which compensation would be measured.

Establishing the Right to a Remedy

One of the leading Hawaii precedents is the 1971 case of Denning v. County of Maui.601/ A private party purchased a parcel of land on Maui, which at the time of purchase was within a "hotel district" as designated by the master plan of the county. This designation specified limitations on the height of a building that could be put on the land and the ratio of floor area to lot area. The purchaser engaged a development corporation to construct a condominium on the property and requested approval of the construction plans from the planning director for the County of Maui. The director gave written "preliminary approval," but also stated that the County Council of Maui had before it a "general plan" proposal that would reclassify this lot and that such reclassification might affect the permissible development on the lot.

Subsequently, the Council enacted an "interim ordinance" that lowered the height that could be permitted in this zone. The developer revised the construction plans accordingly and again received "preliminary approval" from the planning director. Later, the director issued a letter to the development corporation stating that the revised plans conformed to all existing zoning requirements.

On the basis of these assurances, the developer proceeded with the project and incurred substantial architectural, advertising, and legal fees. Less than two months after the director's letter, the County Council enacted into law a zoning ordinance that contained more severe restrictions on buildings in this region. Because the proposed condominium plans could not comply with these new restrictions, the planning director denied a final permit.

The Supreme Court of Hawaii reversed the trial court's decision that the Board of Adjustment and Appeals had jurisdiction to authorize the owner to proceed with construction under the previous zoning regulations. Remanding the case to the lower court for trial, the supreme court laid down the following "rules of law" for the lower court's guidance. For the owner to be allowed the right to proceed with construction, the facts must show (1) that the owner had been given assurances of some form that the proposed construction met zoning requirements by the officials responsible for enforcing zoning ordinances,^{602/} and (2) that the owner had a right to rely on such assurances to a degree that the officials would be precluded by considerations of fairness and equity from enforcing the new zoning ordinance. This second "rule of law" is usually referred to as the doctrine of "equitable estoppel."^{603/} The court pointed out that a crucial consideration could be the interim ordinance lowering the height limitation, the function of which was to protect the design of the proposed general plan while zoning regulations pertaining thereto were in an early stage of formulation. In conclusion, the court emphasized that "mere good faith expectancy that a permit will issue does not create in a property owner a right to continue proposed construction."^{604/} The Hawaii Supreme Court's decision cited several cases from other jurisdictions which help explain the operation of these principles.

The Nature and Source of the Assurances

In a 1963 Illinois case,^{605/} a group of doctors, desiring to construct a medical building near a hospital, purchased a parcel of land zoned for commercial purposes. Because the area so zoned was adjacent to residential areas, an important part of the zoning regulations were specifications regarding off-street parking capacity.

The doctors engaged architects to make a site study and to determine that the parcel was properly zoned. During meetings with the building commissioner, building inspector, and other officials, the architects received approval for the planned construction, but a formal and final permit was never given or denied. Based on these assurances, the doctors organized a corporation and proceeded with their plans, thereby incurring substantial organizational and developmental expenses.

For a year prior to the date of purchase of the property and during the time in which the site study and meetings were taking place, various city planning committees were considering amending the comprehensive zoning ordinance that regulated off-street parking. The doctors and

their representatives were not aware of this activity. After the doctors had proceeded with their plans, the City Council passed an ordinance substantially increasing the required parking space for office buildings.

The Illinois Supreme Court held that the developers had substantially changed their position in reasonable reliance on the probability of obtaining a permit and ruled that the doctors should be permitted to build their office without the new parking requirements. The court emphasized that applicable zoning ordinances were in effect at the time of the property's purchase and that the city officials responsible for knowing and enforcing zoning regulations had given their assurances that the building was acceptable, thereby providing the doctors with a vested right to have a building permit.

The Right to Rely on Assurances (Equitable Estoppel)

In a 1954 Florida case,^{606/} the owner of a chain of drive-in movie theaters purchased unzoned land and erected a highway billboard advertising the site of a new theater in the chain and announcing its capacity. Subsequently, but before construction had commenced, the Board of County Commissioners zoned the proposed drive-in site agricultural. The owner petitioned the Board to rezone the land commercial. Public hearings were held, no protests were filed, and the Board complied with the request. After the owner had prepared the site and purchased sound equipment, protests were filed with the Board and the Board rescinded its previous action, claiming it had not fully complied with the notice requirements of the zoning regulations in conducting its previous public hearings. The owner's pleas for reconsideration and for a permit for nonconforming use were denied even though evidence showed that the land was only suitable for commercial use.

The Florida Supreme Court reversed the Board's action and ordered the permit to be issued on the basis that the owner had been given no reason to believe that the "official mind" would change or that the Board had failed to comply with its own regulations. Thus, the Board was equitably estopped from rescinding its action.

Mere Good Faith Expectation Insufficient

In contrast with these cases, a 1967 California case ^{607/} demonstrates that the timing of events can negate reliance on an expectation of approval to justify proceeding with a project. During 1963 and 1964, the San Francisco Planning Commission and the Board of Supervisors considered and approved a proposed ordinance establishing a maximum height limit on buildings in the Russian Hill area of the city. This approval did not constitute enactment of a law. On January 22, 1964, knowing of the Commission and Board's actions, a developer filed with the Permit Bureau an application to construct an apartment building that exceeded the proposed height limitation. On February 10, 1964, while

the application was being considered, the Board of Supervisors enacted the proposed ordinance to become effective on March 23, 1964. On March 12 and 19, the City Planning Commission and the Permit Bureau, respectively, approved the permit application subject to a right of appeal within ten days to the Board of Permit Appeals. The permit advised the developer to incur no expense until the appeal time had lapsed.

The Russian Hill Improvement Association filed a timely but unsuccessful appeal to enjoin construction. The Board of Permit Appeals found that the Permit Bureau had acted properly under the laws that existed at the time of approval and denied a rehearing. The developer, relying on the Board's action, proceeded with the project. The Association appealed to the San Francisco Superior Court which, on May 4, 1964, revoked the developer's permit. The California Supreme Court upheld the lower court's action, holding that because the law changed between the time the Permit Bureau acted and the time that the application came before the Board of Permit Appeals, the application came before the latter body *de novo* - as a new case. Thus, the law to be applied was the law in effect at the time the application was considered by the Board.

The developer argued that a section of the San Francisco City Charter "immunized" an outstanding permit from changes in the law. The court agreed but stated that normal principles of administrative law contemplate protection of only those permits that have obtained finality in the administrative process and that a permit is not lawfully granted until the appropriate channels of administrative review have been exhausted.

The Nature of the Remedy

In the cases discussed, the remedy to the parties injured by unreasonable changes in the law was permission to continue their projects. An alternative remedy would, of course, be a denial of the right to continue the project and an award of damages for expenses incurred in reasonable reliance upon assurances that the project would be permitted. This theory of remedy was rejected by the Supreme Court of Hawaii in a 1977 decision that reversed a lower court's award of money damages.^{608/} A developer had purchased land in Waialua, Oahu, and proceeded with architectural and engineering work necessary to apply for a permit for construction of a condominium. Prior to the completion of the application, however, a draft ordinance to rezone the property and lower the height limitation was introduced to the City Council by certain Waialua residents in an effort to stop high-rise development in the area. The developer testified in opposition to the ordinance but it was eventually passed. Prior to the enactment, several government agencies had initiated their approval of the permit application, but the application was withdrawn after the ordinance was passed. The Building Department had not finally approved or denied the permit.

The trial court held that mere introduction of a bill did not constitute notice to the developer that the zoning would be changed, that the developer had a right to rely on the prior zoning requirements, and that the city was liable for the costs incurred by the developer in reliance upon the zoning laws in effect and on the reasonable probability that the permit would issue. The Hawaii Supreme Court re-affirmed its rulings on equitable estoppel as announced in the 1971 Denning opinion,^{609/} but it did not carefully examine these facts to determine whether that doctrine applied to this case. Instead it looked at the trial court's remedy and ruled that money damages were not an appropriate solution. If the doctrine of equitable estoppel applied, the developer should be permitted to continue the project. The court could find no judicial precedents for a damage award and also rejected monetary awards as unsound policy, reasoning that it would render a city incapable of action if, each time it sought to rezone, it feared judicially enforced compensation. Furthermore, the court stated that monetary awards would inhibit governmental experimentation in land use control and community control over resource allocation and would constitute a usurpation of legislative power. If the city wanted to stop construction even though the doctrine of equitable estoppel applied, it could buy the property through its powers of eminent domain. This choice to spend public funds must be made by the city, not the property owners.

Conclusion

As explained earlier, these precedents do not apply directly to the dispute over water rights, and analogies are elusive. In the cases discussed, owners had undisputed rights to "property" and their right to use their property was impaired. In the water litigation, the issue is whether the landowners had valid property rights to water, not whether those rights were impaired.

Justice Levinson did argue in his dissenting opinion, however, that the doctrine of equitable estoppel should have been considered by the McBryde majority and that their failure to do so was "legally inexcusable."^{610/} He argued that (1) the government's silence while the landowners invested large sums of money to exploit the water resources and (2) the government's taxation of the surplus waters as private property should prevent the government from later claiming that the private landowners did not own the water.^{611/}

The majority did not respond to these arguments, but in a later case, the Hawaii Supreme Court explicitly ruled that actions by the taxing agencies of the government did not prevent other branches of the government from claiming title to property.^{612/} Other cases in Hawaii and elsewhere have held that certain types of property cannot be alienated by the government even if the government intends to, because such property is held in trust for the public.^{613/}

The actions of previous Hawaii governments and the decisions of previous Hawaii Supreme Courts on water issues have not been consistent,

and so the McBryde majority looked to two early statutes as the firmest foundation to find the law on this issue.^{614/} How the federal appellate court might rule on the taking issue (if it reaches this issue) cannot be definitely predicted. But the Hawaii Supreme Court was acting in accordance with substantial precedent when it examined the ancient law to determine ownership and public access without considering the issues of equitable estoppel or taking. As explained in the introduction to this section,^{615/} the U.S. Court of Appeals for the Ninth Circuit similarly ignored these issues in the 1978 Kaiser Aetna case.

JURISDICTIONAL PROBLEMS REGARDING THE
GOVERNANCE OF WATER IN HAWAII

Introduction

The federal, state, and county governments, native Hawaiians, and private landowners all have certain claims to "jurisdiction" over some of Hawaii's waters.

Hawaii statutes provide for the creation of county boards of water supply and describe their powers and duties.^{616/} The four county charters list the specific powers that the counties have granted to these boards.^{617/} On Oahu, the Honolulu Board of Water Supply (BWS) is charged with the task of providing current and prospective domestic water needs. Yet many agricultural and industrial water consumers on Oahu with private wells, as well as the military bases which also have their own wells, do not fall under the immediate jurisdiction of the board. The board's ability to oversee, manage, and control the total amount of groundwater withdrawal is, therefore, limited.

The State Board of Land and Natural Resources has broad powers and responsibilities to oversee, manage, and control all groundwater uses statewide under the provisions of the Ground Water Use Act of 1961.^{618/} The board has monitoring and research functions under this Act, and more importantly, is empowered to declare any portion of the State facing a water shortage a designated groundwater area. The Act states that such a designation should be made where "groundwater must be regulated and protected for its best utilization, conservation, and protection in order to prevent the threat of exhaustion, depletion, waste, pollution, or deterioration by salt encroachment . . ."^{619/} Although almost 18 years have passed since the enactment of the law, rules and regulations necessary to implement these provisions are only now being drafted and debated.

In February, 1978, a consulting engineer's report to the Honolulu Board of Water Supply showed that at least 18 pumping stations and wells on Oahu maintained an annual average water withdrawal that exceeded the

stations' sustainable yield.^{620/} More water was removed from the groundwater lens at these stations in 1977 than returned via percolation. Although 1977 had a particularly dry winter, the continuation of such rates of withdrawal over a prolonged period (10 to 20 years) and the likely increase in demand with a growing population could exhaust certain groundwater supplies or generate saltwater intrusion in remaining reservoirs.

Effective water management will require avoiding jurisdictional conflicts, particularly in periods of water shortages. The potential for such conflicts is demonstrated by recent efforts of the Honolulu Board of Water Supply to regulate both publicly- and privately-owned wells on Oahu (including the federal wells) in times of shortage by amending Chapter III of its rules and regulations.^{621/} The State, under the 1961 Ground Water Use Act, could also regulate these wells. (A synopsis of the proposed BWS amendment and a summary of the State Ground Water Use Act are presented in Appendix III below at pages 273-74.) The remainder of this section examines the competing constitutional and statutory claims of jurisdiction over Hawaii's waters.

The Interphase of State and County Jurisdictions

The Hawaii Constitution requires the legislature to promote the conservation, development and utilization of water, land and other natural resources of the State, and grants to the legislature the power to vest the management of such resources in executive boards or commissions.^{622/} However, the constitution also provides that the "mandatory provisions of this section shall not apply to the natural resources owned by or under the control of a political subdivision or a department or agency thereof."^{623/} Similarly, the constitution specifies:

The legislative power over the lands owned by or under the control of the State and its political subdivisions shall be exercised only by general laws, except in respect to transfers to or for the use of the State, a political subdivision, or any department or agency thereof.^{624/}

Neither these constitutional provisions nor the state statutes and county charter provisions regarding county boards of water supply clearly delineate the conditions under which the State has authority superior to that of the counties and vice versa. The relationship is further confused by statutes declaring that the state may not initiate irrigation projects in any county unless the State Board of Land and Natural Resources first consults the Board of Water Supply of that county.^{625/}

One of the questions that remain unresolved is currently being investigated by the State Attorney General's Office: Do the Honolulu Charter provisions empowering the BWS to regulate private wells ^{626/}

exceed the authority granted to them by the legislature?627/ The critical words in Hawaii Revised Statutes, section 54-15, are "manage, control, and operate the waterworks of the county and all property thereof, for the purpose of supplying water to the public in the county . . ." (emphasis added). The answer to this question requires an analysis of legislative history which had not yet been completed by the Attorney General's Office at the time of this writing. Controversies regarding state and county powers have been frequent in recent years and are not limited to water rights.628/

The only Hawaii water statute that specifically asserts the state's superior authority is the 1961 Ground Water Use Act, which had not been fully implemented at the time of this writing. The Act provides that:

No state or local government agency may enforce any ordinance, rule, or regulation that affects the use of ground water from a designated ground water area . . . unless the board of land and natural resources has approved the ordinance, rule, or regulation.629/

This statute is only applicable, however, to groundwater and to areas "designated" in response to shortage conditions. The legislative history and language of the 1961 Ground Water Use Act clearly indicate that the legislature did not intend that the state's power preempt the BWS's power, except when the State actually designates a groundwater area.630/ Jurisdictional conflicts may still arise, however, because (1) the BWS asserts that it cannot adequately fulfill the assignment given it in the county charter unless it has control over all wells on Oahu, and (2) if the BWS amends its rules (see Appendix III, pages 273-74), the same shortage conditions may trigger both state and BWS action, resulting in inconsistent procedures and directives under dissimilar regulations and unnecessary governmental duplication.

The question whether the State or the county is the appropriate governmental entity to regulate, manage, and control groundwater use, under either normal or shortage conditions, requires consideration of four major issues:

- (1) The power of the county, through the BWS, to regulate privately owned wells.
- (2) The intention of the BWS, in times of shortage as measured at certain test locations, to restrict pumping on an island-wide basis without preserving existing uses (see Appendix III, pages 273-74, for the proposed amendment to Chapter III of the BWS rules and regulations).
- (3) The legality and desirability of the BWS practice of transporting water from one hydrological basin for use in another area while restricting users in the supplying area because of shortage conditions.

- (4) The potential conflicts of interest and disincentives that result when a water purveyor has regulatory authority beyond its own system.

Regulating Privately Owned Wells.

The BWS's assertion of jurisdiction over privately owned wells is based on two sections of the Honolulu Charter which state:

All water and sanitary sewerage systems of the city,631/ including water rights and water sources, together with all materials, supplies and equipment and all real and personal property used or useful in connection with such water and sanitary sewerage systems shall be under the control of the department.632/

and:

The board of water supply shall: . . . Prescribe and enforce rules and regulations having the force and effect of law to carry out the provisions of this article of the charter, including . . . (6) in times of shortage or threatened shortage of water or of danger to potability of the water of any ground water basin or area by overdraft on such basin, the restriction of the drawing of water in all wells supplied from such basin on a basis proportionate to the proper and beneficial uses served by them respectively633/

In the opinion of the presiding officer of the State Water Commission, these provisions directly overlap state powers to designate groundwater areas and to require permits for water use in times of shortage 634/ (see Appendix III - Summary of the Ground Water Use Act, pages 274-75).

The BWS claim of statutory authority to regulate private wells derives exclusively from the pervasive use of the word all in the above provisions. An alternative construction, however, would follow from emphasis on the words "systems of the city." The latter construction would restrict the county's jurisdiction to its own system. The legislature, in the 1961 Ground Water Use Act, specifically asserts state jurisdiction over any and all persons, defined to include "public and private corporations, associations, estates, and individuals."635/ Lack of such specificity in the charter provisions might indicate that the framers of the charter did not intend to assert such an expansive authority over the private sector. Regardless of the legitimacy of the county's statutory claim, one must next address the question of whether the state or county will prove supreme when jurisdictional conflicts do arise.

A 1976 Hawaii Supreme Court case illustrates the statutory and constitutional issues involved in a conflict between state and city powers over private property.^{636/} The State instituted eminent domain proceedings to condemn private residential property to expand the mauka area of the University of Hawaii's Manoa campus. The property owners challenged the proceeding on the basis that the General Plan of the City and County of Honolulu designated that area as residential. The property owners supported their position by reference to Honolulu Charter provisions stipulating that no improvement or project shall be initiated or adopted unless it conforms to and implements the development plan for that area.^{637/} Furthermore, the legislature provided that the city charter is the organic law of the county and:

shall supercede any existing charter and all laws affecting the organization and government of the county which are in conflict therewith.^{638/}

The court nonetheless upheld the condemnation based on the provision of the Hawaii Constitution requiring the State to provide for establishment, support, and control of the state university. The court stated:

On functions of statewide interest and concern, the general rule is that if the counties are not given specific authority to take over that function, the counties cannot thwart the State from performing its duty.^{639/}

The court, in support of its holding, also cited the Hawaii constitutional provision that:

Each political subdivision shall have power to frame and adopt a charter for its own self-government within such limits and under such procedures as may be prescribed by general law.^{640/}

Although the court's analysis would appear to support state supremacy over private property rights in a manner that seems analogous to state regulation of private water wells, the Honolulu BWS and deputy corporation counsel have tried to distinguish the two situations by arguing that counties have been given specific authority to take over the water regulation function.^{641/} Also, they point out that the Hawaii Supreme Court concluded its opinion by stating:

We make it expressly clear that this opinion of the court does not deal with the question, to wit: is Section 5-412.3 of the Charter inapplicable to all State public projects? It could very well be that the "balancing of interests" test . . . is the appropriate test to apply in determining whether certain other State public projects fall within the provisions of Section 5-412.3 of the Charter.^{642/}

Thus, the deputy corporation counsel's opinion concludes that litigation could result in a decision that the State has absolute power to ignore BWS restrictions or in the application of some "balancing of interests" solution. Accordingly, the deputy corporation counsel urged the BWS to frame its jurisdictional powers broadly. As a result, private wells have been included within the provisions of the proposed amendment to the BWS rules.

Preservation of Existing Uses During Periods of Restriction.

The State and the Honolulu BWS appear at the moment to have different philosophies of restriction during periods of shortage. Under the 1961 Ground Water Act,^{643/} the State would preserve existing uses and restrict additional uses; the county's proposed regulations would restrict existing uses and they express no necessary prohibitions against new uses. The attorneys for Campbell Estate advance the argument that the BWS cannot possibly regulate private water wells in this manner because the state legislature cannot delegate powers to a political subdivision superior to the powers that it has reserved for the State.^{644/} The 1961 Ground Water Use Act recognizes and respects private water rights by (1) exempting domestic uses from permit requirements, and (2) allowing existing uses to continue in full, providing that they are certified to the Board of Land and Natural Resources, and (3) requiring that all increased or new uses be by permit - including those contemplated by the BWS. Because such permits apparently would not be granted where they interfere with existing uses, new municipal uses would have no higher priority and the BWS would be simply another applicant. This result may not have been intended by the legislature, and it could be corrected by amending the governing state statute.

Transporting Water from Its Hydrological Source.

The practice of the Honolulu BWS is to transport municipal water from developed hydrological groundwater basins where water is plentiful to areas overlying distant and distinct basins where water is scarce. Even during periods of normal water supply, this practice has been opposed by Life of the Land, the Navy, Oahu Sugar Company, Campbell Estate, Foster Botanical Gardens, Oahu Nursery Growers, and individual farmers.^{645/} Thus, even though the sugar companies have benefited from their transportation of surface waters for distant irrigation, they have tended to oppose the transportation of groundwater by the BWS to serve domestic consumers.

The arguments against BWS groundwater transfers concern both economics and growth management. Groundwater transfers allow the BWS to guarantee water supplies to new development projects by drawing from the basins of other users, thereby penalizing voluntary conservation efforts and elevating urban development above agriculture and alternative uses. Through this manipulation, it is argued, the BWS is unilaterally making economic policy regarding land use and state development. Oahu Sugar Company's situation typifies the concern.^{646/} Oahu Sugar's president has stated that the company remains in business only because they can

demonstrate profitability in several years based on higher yields and more producing acreage.^{647/} Their planning does not take into account unexpected water shortages or restrictions resulting from transportation of their groundwater elsewhere.

Oahu Sugar Company and Campbell Estate advance the following legal defenses against restrictions upon water use in an area from which the BWS is supplying or has supplied other areas.^{648/} First, the doctrine of correlative rights, as interpreted by the Hawaii Supreme Court,^{649/} provides that land ownership carries with it the right to use underground water beneath the surface of the land owned, limited only by the requirements (a) that the use does not injure the water supply of neighboring landowners and (b) that the water is used upon the land overlying the source. Other users who do not own overlying land may acquire water rights in excess waters, but those rights are inferior to correlative rights. Thus, in times of shortage, the non-landowner who is exporting water must cut back first. If the BWS is the exporter, supplying municipal needs in another area, and the BWS is also restricting pumping by overlying landowners, a conflict of interest appears. Conceivably, a court could find an unconstitutional taking of property rights without just compensation.

A second argument is that the BWS powers enumerated in the Honolulu Charter, although ambiguous, arguably state that any restrictions on the use of water must be limited to the basin in which the shortage exists. This argument is based on an interpretation of the words:

. . . in times of shortage . . . or of danger to potability of the water of any ground water basin . . . the restriction of the drawing of water in all wells supplied from such basin . . .^{650/}

Thus, the argument is that if the BWS cannot supply its customers from the basin over which they reside because of a shortage in that basin, it cannot make up their shortage by restricting overlying users of a different supplying basin. Oahu has six groundwater basins, as delineated in the Hawaii Water Resources Plan of April, 1977.^{651/} The hydrological evidence seems to indicate that pumping from one area does not reduce levels in another.^{652/} Thus, BWS restriction of pumping in any area without a shortage to subsidize users in a shortage area is arguably a violation of its charter mandate.

Conflicts of Interests and Disincentives.

Many technical arguments against the proposed BWS amendment concern (1) the criteria employed to determine that a shortage or danger exists, (2) the ambiguous wording of the criteria, and (3) the arbitrary division of users into classes with unlimited discretion to regulate each class separately.^{653/} Common to these criticisms and fundamental to the state/county jurisdictional question is the concern that, without state regulation, the BWS need never regulate itself and has made no provisions for doing so. Therefore, the BWS has no incentive to develop

new sources (such as tapping the virtually untapped north shore district), modernize its drilling techniques (such as using "skimming wells"--instead of vertical wells--as recommended by the Navy),^{654/} upgrade its facilities, or explore methods of treating and using urban effluent on agricultural land rather than discharging it to sea. Some have argued that the proposed shortage criteria measures not the condition of the basin but the antiquity of the BWS equipment.^{655/}

Because it is a water supplier, the BWS may have a tendency to encourage new development, keep revenues high, and de-emphasize urban conservation. As a result, according to the president of the Oahu Sugar Company, Oahu has one of the highest per capita consumption rates in the nation.^{656/} Because it is also a water regulator, the BWS can adopt the least expensive alternative and maintain supply by restricting other private uses.

Federal Wells

To supply its military facilities throughout Oahu, the federal government obtains fresh water both from the BWS and from its own four wells. The Navy does not contest the power of the BWS to regulate Navy use of the BWS system and asserts no greater right than any other BWS customer. However, the Navy denies any state or county jurisdiction over water from federally-owned wells.^{657/}

A 1976 United States Supreme Court decision restated the general principles governing water rights on federal lands.^{658/} In 1952, the United States had established Devil's Hole National Monument in Nevada. Devil's Hole consisted, in part, of a surface pond and a subsurface pool fed by an underground water source. A unique type of desert fish thrived in the pool and depended upon certain water levels for its existence. In 1968, private ranch owners drilled wells on their property within two and one-half miles of Devil's Hole. The ranch owners applied to the Nevada State Engineer for pumping permits, which were granted over the objections of the National Park Service. No party contested the fact that the Devil's Hole and the ranch aquifers were hydrologically connected. Pumping by the ranch owners began to lower the Devil's Hole water level.

The Supreme Court enjoined the ranch owners from pumping quantities that would lower the Devil's Hole aquifer to unacceptable levels. In so doing, the Court stated:

This Court has long held that when the Federal Government withdraws its land from the public domain and reserves it for a federal purpose, the Government, by implication, reserves appurtenant water then unappropriated to the extent needed to accomplish the purpose of the reservation. In so doing, the United States acquires a reserved right in unappropriated water which vests on the date of the

reservation and is superior to the rights of future appropriators.659/

In addition:

In determining whether there is a federally reserved water right implicit in a federal reservation of public land, the issue is whether the Government intended to reserve unappropriated and thus available water. Intent is inferred if the previously unappropriated waters are necessary to accomplish the purposes for which the reservation was created.660/

Drilling wells to supply major naval facilities clearly constitutes removal of land from the public domain for a federal purpose and evidences intent to reserve unappropriated water necessary for that purpose. However, the City and County of Honolulu's deputy corporation counsel has argued that the case cited is different from the situation in Hawaii in the following ways:661/

- (1) Devil's Hole involved surface water as well as ground water.
- (2) Nevada recognizes the doctrine of prior appropriation whereas Hawaii has judicially established the correlative rights doctrine.662/
- (3) The federal government was the first to claim rights in the Devil's Hole aquifer (the ranch owners drilled later), whereas in Hawaii, several plantation wells were drilled before the Navy drilled its wells.

On this basis, the deputy corporation counsel concludes that the federal government does not have a "clear cut" case and that undiminished Navy pumping in times of shortage, when all other water users are regulated, may be a constitutional violation of the equal rights of all other water users as defined by the correlative rights doctrine. The deputy corporation counsel's opinion, while again recommending that the BWS draft its regulations as broadly as possible to regulate federal as well as private wells, does contain an important caveat: if the BWS must enforce its rules against federal or state agencies, it may have to resort to negotiation or arbitration, rather than legal action, because the rule of primacy as to water rights in Hawaii is unsettled if invoked against a governmental agency with superior sovereign powers.

The three distinctions claimed in the corporation counsel's opinion appear to be addressed in the U.S. Supreme Court's Devil's Hole opinion and answered in favor of federal claims. As to the distinction between surface and groundwater, the Court states:

Thus, since the implied-reservation-of-water-rights doctrine is based on the necessity of water for the purpose of the federal reservation, we hold that the United States can protect its water from subsequent diversion, whether the diversion is of surface or ground water.663/

As to state legal doctrines, the Court states:

Federal water rights are not dependent upon state law or state procedures and they need not be adjudicated only in state courts.664/

And regarding distinction(s) that private plantation wells were drilled prior to the Navy wells, the Court speaks not to the question of which party drilled first but to the question of whether unappropriated or available water was present at the time of the reservation. The fact that the BWS's predecessors drilled their wells after the Navy drilled its wells indicates that water was available beyond the needs of the plantations. Accordingly, one must conclude that the power of the BWS or the State to impose mandatory restrictions on federal wells is limited, especially because the Navy has implemented a voluntary conservation program that has resulted in a 40% reduction in fresh water consumed by Naval activities within the last year.665/

Native Hawaiian Claims and the Reserved Water Rights Doctrine

The United States Supreme Court in its 1976 Devil's Hole opinion relied heavily on a 1908 Supreme Court decision,666/ in which the Court first enunciated the implied-reservation-of-water-rights doctrine.667/ The 1908 case, Winters v. United States, involved a group of investors and farmers who developed a scheme to dam and divert the Milk River in Montana to provide irrigation water to settlers who acquired property under the federal homestead and desert land use acts. Following sizeable expenditures and after complying with state appropriation procedures, they created a successful farming community. Downstream, however, the Fort Belknap Indian reservation had previously been created by treaty between the United States and certain Indian nations. The upstream diversion restricted the water flow reaching the reservation to the point that it was no longer adequate for irrigation, livestock, or domestic use by the Native-Americans.

The United States brought a suit on behalf of the natives to prevent the upstream diversion. The Court held that the federal government had acquired, as of the date of the treaty, an appropriation of all water needed to fulfill the purpose of the reservation. Since the Fort Belknap treaty was concluded in 1888 and the upstream diverters began their activities in 1900, the upstream appropriators were junior in right to the natives, and the newcomers were thus enjoined from diverting any substantial quantities of water from the Milk River. The

fact that the natives had not begun to use substantial quantities of Milk River water until 1904 was deemed immaterial by the Court, as was the substantial economic losses that would accrue to the upstream community.

The Court reasoned that the natives had, prior to the treaty, control over all of the lands bordering the Milk River and, consequently, control over all of the river waters. These lands, excepting Fort Belknap, were ceded to the United States in the 1888 treaty. These ceded lands became part of the public domain and were subject to settlement and disposal in fee simple under various homestead and desert land use laws. The natives, however, having water rights in all of the larger areas, did not cede them with the land but confined them to a smaller area in their effort to become a stable and civilized society. The object and intent of the parties was to give the natives sufficient resources to establish permanent homes and to gain a livelihood by cultivation of the soil. The intent of the government to reserve unappropriated and available water as of the date of the treaty was inferred because the water was clearly necessary to accomplish the purposes for which the reservation was created.

The facts in the Fort Belknap case are analogous to the historical circumstances surrounding Hawaii's annexation and the transfer of sovereignty over its lands to the United States. In 1921, the United States Congress passed the Hawaiian Homes Commission Act, 1920,668/ which created the Hawaiian Homes Commission as the executive board of the State Department of Hawaiian Home Lands.669/ The department was charged with leasing tracts of these lands to native Hawaiians at nominal rentals on ninety-nine year leases.670/ Under the conditions of the lease, the lessee would occupy and commence to use or cultivate the tract as his or her home or farm.671/ Also, the Act provides for revolving funds to underwrite private loans and for direct loans for home construction or repair, commercial and mercantile establishments, and the purchase of livestock, farm equipment, and other agricultural supplies. As for water rights, the Act defines "surplus water" as government-owned water under a water license or privately-owned water in excess of the quantity required for the use of the licensee or owner.672/ The department is authorized to use, free of charge, government water needed to supply the agricultural or domestic needs of lessees and to purchase or condemn private surplus water for the same purpose.673/ Furthermore, the Act provides that all water licenses issued after its passage are subject to the condition that the licensee shall, upon demand of the department, grant to it the right to use, free of charge, any water which the department deems necessary to supply the livestock or the domestic needs of individuals on the leased tracts.674/

Subsequent to the Act's passage, the State Organic Act was amended to exclude from "public lands" any lands reserved by the Department of Hawaiian Home Lands.675/ Later, the Admissions Act required adoption of the Hawaiian Homes Commission Act as a provision of the state constitution, with some provisions subject to amendment or repeal only with the consent of the United States Congress.676/ The Hawaii Constitution

thus provides that the State and its people accept, as compact with the United States, that the Hawaiian Homes Commission Act, 1920, shall govern the management and disposition of Hawaiian Home Lands and that the "spirit of the Hawaiian Homes Commission Act looking to the continuance of the Hawaiian homes projects for the further rehabilitation of the Hawaii race shall be faithfully carried out."677/

The parallels between the Hawaiian and the Fort Belknap circumstances are many. In both cases, the natives had originally held water rights to a generalized area. Most of the area was later ceded to the United States. In both cases, certain lands were reserved by Congress for the benefit of the natives. The clear intention of the Congress in reserving the lands was to create stable, civilized, agriculturally-based communities. In both Hawaii and Montana, lands not so reserved became part of the public domain. The only substantive difference between the two situations is that in Montana the land reservation was an integral part of the same instrument that ceded the lands to the United States - the 1888 treaty. In Hawaii, the reservation of the lands occurred through a special act of Congress in 1921, over twenty years after the formal transfer of sovereignty from the Republic of Hawaii to the United States (1898) and the establishment of the territory of Hawaii by the Organic Act in 1900.

This analysis suggests that under the implied-reservation-of-water-rights doctrine, lessees of tracts of Hawaiian Homes Commission land are senior appropriators of any water available as of July, 1921, in quantities sufficient to accomplish agricultural or domestic purposes for which the tract is occupied. Thus, the water rights provisions of the Hawaiian Homes Commission Act itself are consistent with the implied-reservation-of-water-rights doctrine, and the doctrine itself would appear to confer these rights even in the absence of such provisions.

Conclusion

The State Department of Land and Natural Resources and the presiding officer of the State Water Commission have recommended that the proposed amendment to the BWS rules and regulations delete references to private wells and that if area-wide groundwater control is necessary, the BWS work with the Department of Land and Natural Resources under the 1961 Ground Water Use Act as follows:678/

- (1) At the initiative of any party, the department will assess a possible shortage or danger situation in cooperation with major purveyors (BWS, Navy, private).
- (2) Upon department designation of a low ground water area, all purveyors will be given notice to restrict pumping proportionately. This notice would be implemented by formal cooperation agreements, or by formation of agency associations as provided under the Act.

- (3) The permit and other provisions of the 1961 Ground Water Act would be put into effect.^{679/}

The Department and the Water Commission's spokesperson assert that this scenario works well on the other islands and is most logical on Oahu because:

- (1) The state has higher jurisdictional authority and questions exist concerning the extent of county authority over private wells.
- (2) The department can better coordinate and cooperate with state agencies at the same level of sovereignty (for example, the Department of Health).
- (3) The State has no vested interest as a purveyor of water.

The State Water Commission's 1978 report formally recommends that the State regulate water development and use on all the islands.^{680/} In addition to the reasons listed above, the report emphasizes also that other Western states have statewide regulatory programs and that the 1978 Water Resources constitutional amendment ^{681/} specifically instructs the legislature to establish a new "water resources agency" to regulate all of the state's water resources.

Because of the 1978 constitutional amendment, which is discussed below at pages 264-66, a statewide regulatory approach is now required. The water rights of the federal government and of native Hawaiians may, however, in some cases be superior to all others--including the State--and therefore negotiation may be necessary with these two groups.

CONCLUSIONS AND RECOMMENDATIONS

This report has covered extensive territory in detail, and the reader should refer back to the text for the arguments and supporting data that have led us to the conclusions and recommendations that follow. Because so many others have written on this subject before and because reasonable people can disagree on these issues, our conclusions and recommendations are offered not as the final word on the subject but rather as our attempt to make some sense out of the past and to help chart a direction for the future.

Conclusions

1. The 200 years that separate us from the traditional Hawaiian approach to water rights and other property questions were years of unusual turmoil and change. Cultures based on vastly different experiences came together on these islands and struggled to deal with the economic and human problems that existed. Change occurred rapidly. Traditions were lost. New institutions were created, not always with the support of the majority of those living here. The islands were annexed to one of the most powerful nations in the world, and new laws and institutions were imposed on the residents. Only recently has full self-government been restored and only recently have the native peoples begun to petition for a full redress of their grievances. It is probably more appropriate, therefore, for the "law" to be re-examined and restructured here than it would be in a community where change had been achieved more gradually and with the full participation of the citizenry.

2. The review of the decisions of the Hawaii Supreme Court on pages 176-200 concludes that the law on water rights was not "settled" prior to 1973 when the Hawaii Supreme Court rendered its decision in McBryde Sugar Co. v. Robinson.^{682/} The Hawaii Supreme Court reversed itself several times in its early cases involving water rights,^{683/} and the Territory at several points argued that it had rights to water greater than those that had been recognized.^{684/} Native claims to water were not fully articulated until recently and were rarely considered by the court. Although several commentators tried to codify Hawaii's water law,^{685/} they all viewed the law in Hawaii as unique and presented their summaries with caution. Many questions never reached the courts. The 1917 decision ^{686/} was based on different principles than those that had governed the 1904 decision,^{687/} and the 1930 decision ^{688/} rejected the principles that had guided the 1917 court. Even the important 1930 case of Territory v. Gay ^{689/} was decided by a divided court with each of the three justices having different views on the issues. The majority's holding in this case appears to be based on principles that differ from those used by the same court in another water case the year before.^{690/} The law has been actively disputed for years and cannot be described as "settled."

3. The majority opinion of the Hawaii Supreme Court's 1973 decision in McBryde looks at the entire history of Hawaiian law and attempts to integrate its inconsistent features into a coherent whole.^{691/} Although reasonable persons can disagree on the details of the court's opinion, and on the result, it was certainly proper for the court to try to reconcile conflicting themes in Hawaii's jurisprudence. The court acted within its jurisdiction, and the result should not be viewed as unreasonable, arbitrary, shocking, or particularly surprising. The majority opinion bases its conclusions on an interpretation of statutes and states that the legislature is free to enact new statutes if it prefers a different result.^{692/}

4. The law in Hawaii on water rights prior to McBryde (1973) was unique in the United States. No other jurisdiction permitted private

ownership of water to the extent claimed by the sugar companies and apparently authorized by the Hawaii Supreme Court in 1904 and 1930.^{693/} Water is generally viewed elsewhere as a resource that cannot be "owned" because it is free-flowing and is thus not subject to possession. The debate over "ownership" of waters may not be as significant as some advocates have claimed. As we explain at pages 216-17, above, the conclusion in McBryde that the State owns the water may mean only that the State can control and regulate the water--a power the State has always had. Under this interpretation, it would not make sense to say that anything was "taken" from other parties. Other states where water is scarce allow private water use by issuing permits for such use or by allowing an "appropriation" of the water by a private user who generally must register the appropriated claim. This right to use "appropriated" waters is not an ownership right. It cannot be bought and sold as freely as land. It does not necessarily last forever. It is a right to use the water that is valid either for a specific number of years or for as long as the water is being put to a beneficial use.^{694/}

5. The McBryde decision does not state that water can never be transported from one watershed area to another. The majority's opinion holds that the two private landowners, McBryde Sugar Company and Gay & Robinson, cannot transport water out of the Hanapepe Valley because their water rights are appurtenant and riparian water rights which are limited to use within the original watershed area.^{695/} The court also holds that, because the early Hawaiian statutes were designed to bring the riparian doctrine of water rights to Hawaii, no landowner can divert water to the injury of other landowners who "are entitled to have the flow of water in the Hanapepe River in the shape and size given it by nature."^{696/} The court explicitly grounded these rulings on the early Hawaiian statutes that were found to govern this subject,^{697/} and the court invited the legislature "to conduct a thorough re-examination of the area."^{698/} The legislature can, therefore, consider new legislation that would amend the court's rulings on the transferability question.^{699/}

6. The 1973 decision of the Hawaii Supreme Court on water rights ^{700/} will probably survive federal court review and stand as a contribution to the law of Hawaii. Although the U.S. District Court issued a stinging rebuke to the Hawaii Supreme Court in its 1977 decision of Robinson v. Ariyoshi,^{701/} the claim of the federal district court that it has jurisdiction over this controversy is open to serious doubt. If federal courts can review state court decisions whenever the rules of property law are altered, then our dual system of courts will have been drastically transformed. The trend of decisions by the U.S. Supreme Court in recent years has been to reduce federal court intervention into state affairs.^{702/} The 1977 decision of the U.S. District Court for the District of Hawaii is in conflict with these opinions and will probably be reversed on appeal.^{703/}

7. Whatever the final decision on who "owns" the water, it is clear that the sugar companies have been using the water in recent years and have been producing economic benefit from this use. The sugar companies have helped develop the water resources of the islands by building and maintaining the irrigation ditches. Virtually no one has

argued that the sugar companies should be denied access to this water during the near future. The water situation is probably not yet critical enough to justify reallocation of this water at the present time. Any permit system that is adopted should acknowledge the need for some stability on the part of those who have invested in water during previous years.

8. It would not, however, constitute a "taking" of property for the interest of the sugar companies in water to be converted to an economically equivalent use right through a state-administered program. The State Water Commission has recommended that the legislature adopt a permit system, under which all water users (except domestic consumers) would be required to obtain permits for their use which would be limited in time to a 30- to 50-year period.^{704/} This time period was selected to allow "the permittee to amortize his investment."^{705/} "[R]enewals would be subject to review and approval."^{706/} This proposal is similar to statutes adopted in other states.^{707/} Such conversion statutes have not generally required compensation and have been accepted as constitutional by the courts.^{708/} From an economic perspective, a right of ownership of water--which is a right to use that water forever--is not significantly different from a right to use the water for 30 to 50 years.^{709/} This period should be adequate to justify new capital investment to exploit water sources. Some economists think that if the sugar companies were to sell a right to use water for 30 years, they would receive approximately the same amount they would receive if they sold their "ownership" interest in that same water.^{710/} If this analysis is correct, substituting a right to use water for 30 to 50 years for an "ownership" right would not involve any discernible economic loss to the sugar companies and hence, would not require any compensation. The State Water Commission's proposal would allow permits to use water to be freely "transferable within the permit period if there were no change in use."^{711/}

9. If the federal district court decision overturning McBryde is sustained on appeal and if the permit system described above were found to constitute a "taking" in violation of the federal constitution, the measure of compensation the State would have to pay the private landowners would be the difference in the value of the land attributable to this change. Courts have consistently used the change in land value as the measure of damages when water rights are altered because water is not freely traded on the open market and hence has no easily measurable fair market value of its own. The burden would be on the private landowners to prove how much the land value has been affected because of the loss of water. In other words, the court would compare the value of the land with water rights to its value without those rights. If the land can be easily converted to a profitable use requiring less water, or if the private landowners are not making much profit by their current use (raising sugar), then the State might not have to pay much compensation for their "taking" of the water.^{712/}

10. Whatever the final result of the federal litigation might be, it is appropriate for the legislature to act--and to act soon--to

regulate water uses in Hawaii. The present state of uncertainty has inhibited the state's regulation of water resources, and this uncertainty should be ended as soon as possible. Private as well as public users need certainty regarding the availability of water, and it is in all of our interest to use our water in the most efficient and beneficial manner. No matter what the final outcome may be in the Hanapepe Valley litigation, the State will be able to control most of the water both because the State already owns much of the land in the rainy sections of the islands and because its police power permits the regulation of private water for the public welfare. A great deal of the state's water has been leased to private parties, frequently at rates that seem generous to the private parties.^{713/} The State could control these waters more carefully. And, the legislature is free to regulate private waters as other states do.^{714/} No reasons exist why the state legislature needs to wait for the end of the federal litigation before acting.

11. The Water Resources amendment recently added to Hawaii's Constitution ^{715/} requires the legislature to "assure" "appurtenant rights," which are the rights to water needed to grow taro on plots that have historically been used for this purpose. This goal could be achieved by excluding small plots of land (e.g., less than ten acres) from the requirement of obtaining a use permit. New water legislation in Hawaii must also acknowledge the federal commitment to provide sufficient water for the native lands now governed by the Hawaiian Homes Commission and other federal rights to water, which may be superior in some respects to competing claims to water.^{716/}

12. The legislature can and probably should set priorities for water use. Most states do this in quite general terms. Chapter 177 of the Hawaii Revised Statutes, relating to groundwater restrictions in designated shortage areas, grants a priority to "domestic, municipal, and military uses"^{717/} without going into any greater detail. The Alaska statute, quoted above at page 228, is one of the most specific formulations, but still leaves considerable discretion to the decision-making body. It would seem appropriate for the Hawaii Legislature to spell out priorities of water use in some greater detail, although flexibility should be left for the water agency to meet unexpected future demands after full public hearings. Priorities in Hawaii should include protection of the fragile environment of the islands, and thus should guarantee some minimum stream flow.

Recommendations

The legislature should consider adopting a permit system of water use applicable to all ground and surface water resources in Hawaii. To provide incentives for conservation efforts, this system should apply equally to all water users, including governmental bodies that supply municipal or other public requirements. Such a system could be modeled on Chapter 177 of the Hawaii Revised Statutes, which is now applicable to groundwaters in designated areas where the waters are being depleted.

Chapter 177 requires all groundwater users in a designated area (except domestic users) to register their use.^{718/} Existing uses are then maintained, subject to equitable regulation needed to cope with the depleted resource.^{719/} The permits granted to pre-existing users under Chapter 177 are not limited in time but can be revoked for nonuse of the water or for other violations of the chapter.^{720/} And, as mentioned earlier, the pre-existing user has no absolute right to the water and must cut-back use as required by the Board of Land and Natural Resources in times of shortage.^{721/}

The new Water Resources constitutional amendment adopted in 1978 ^{722/} is similar to Chapter 177 in maintaining at least some of the pre-existing water uses. The new amendment requires a new "water resources agency" to "establish criteria for water use priorities while assuring appurtenant rights and existing correlative and riparian uses and establish procedures for regulating all uses of Hawaii's water resources."^{723/} The intent of this language seems to be to preserve the ancient taro water rights against all subsequent extinguishment and to preserve correlative groundwater rights and riparian rights to surface waters insofar as they have actually been used. All other waters would be apportioned according to the established "criteria for water use priorities." The language regarding correlative and riparian uses is somewhat similar to that used in the 1928 California constitutional amendment which restricted riparian rights to reasonable beneficial use and reasonable methods of diversion.^{724/} The language certainly authorizes the water agency to require correlative and riparian users (but perhaps not holders of appurtenant rights) to register their claims and obtain permits. The amendment sets no limits on the regulation of waters not covered by such pre-existing uses. This new language constitutionalizes some of the holdings of the McBryde decision,^{725/} but still gives the legislature considerable flexibility in implementing the amendment.

The statutes of other states offer additional models. Several recently enacted permit systems restrict water use rights to a specific term of years ranging from 20 to 50 years.^{726/} The State Water Commission's proposal for such a permit system limited in time (30 to 50 years)^{727/} would be appropriate in Hawaii for those waters not covered by the new constitutional amendment's language referring to "appurtenant rights and existing correlative and riparian uses," so that future generations will not be unnecessarily bound by the decisions of their parents and grandparents. Water users need some security about their water source, but many economists feel that 30 to 50 years is an adequate time frame to ensure this security. If a water user plans additional capital investment, the user can petition for a renewal at any time to ensure a full 30- to 50-year use to justify the investment. Such a petition would be granted if water supplies are sufficient and if the use is consistent with the state's priorities at that time.

Under such a system, existing water uses would be registered and current water users would be given permits "if the existing use is a reasonable beneficial use."^{728/} Requests for additional water would be granted if such additional uses do not injure current users and if the

requested use fits into the community's priorities for water use. Statutes from other states that incorporate these ideas are offered in the text at pages 221-22, above, and footnotes 483-89.

Three additional issues need to be considered. The new constitutional amendment's preservation of "appurtenant rights" appears designed to ensure that native and other small farmers are not deprived of their remaining rights. Beginning with the Great Mahele in 1848 and continuing in the years following annexation, governments in Hawaii have required persons to register rights to land, water, fishing areas, and so on, and the result has always been that many of the poor have lost what little they have had to the rich and better-educated.^{729/} It may be appropriate to exempt persons using water for agricultural purposes on fewer than ten acres of land from a registration requirement, to ensure that such a loss does not occur again. Such an exemption would be analogous to Chapter 177 of the Hawaii Revised Statutes, which excludes domestic users from the general requirement of obtaining permits to continue using groundwaters.^{730/} The proposal of the State Water Commission does exempt water uses "derived from appurtenant rights" from the permit requirement.^{731/} Their proposal does, however, require the appurtenant users to register their uses in order to ensure that the regulatory agency has a complete picture of all water uses, once again following the model established in Chapter 177.^{732/}

The second related issue is whether water use permits should be freely transferable. Given perfect market conditions, economists would generally favor free transferability of such rights to promote maximum beneficial use. However, some economists would argue that private markets do not correctly reflect the external costs and benefits to society associated with significant changes in water use (e.g., from agriculture to urban). In order to ensure that society's water use priorities are maintained, some states permit free transferability of use permits if the type of use remains the same, but require new permits if the purpose for which the water is used changes.^{733/} This latter approach has been recommended by the State Water Commission.^{734/}

Finally, should the water itself be transferable from its point of origin to an area needing irrigation outside the original watershed area? All economists and water engineers appear to agree that transfers of water are necessary to promote maximum economic use of land and other resources. Water has been transferred in Hawaii from the earliest times that such transfers became economically feasible. Water is needed today in the arid regions of the islands, and a decision that prevented water transfers would prevent our full uses of the arid parts of our community. Surely, therefore, some transfers should be permitted.

Such transfers should, however, be closely supervised, because they can cause important changes to the ecological system. Permits should be required for all transfers of water. They should be granted when the water transfer would not harm the existing ecosystem and the use to which it is being put is consistent with the overall priorities for the region. Even parties with appurtenant, correlative, and riparian water

rights should not be permitted to transfer their water freely because such transfers would distort the meaning of their rights. They should be required to obtain authorization for such transfer and should not be given any superior right to transfer based on their appurtenant, correlative, or riparian use right.

To summarize:

(1) A permit system of water use applicable to all fresh waters on the islands appears to be a constitutionally acceptable management approach. Such regulation could provide the basis for defining rights to and beneficial uses of water in Hawaii.

(2) Any system adopted should preserve the ancient taro or appurtenant water rights of native and other small farmers.

(3) It should also recognize existing correlative and riparian water uses but should require such users to obtain use permits.

(4) The legislature should give serious consideration to the proposal of the State Water Commission requiring all major users of water to obtain use permits limited in time to 30 to 50 years in length.^{735/} Under this proposal, renewals would not be automatic, but would depend on the availability of water and the community's priorities for water use. Renewals could be requested at any point to enable users to add new capital investment to their water distribution system.

(5) Under the State Water Commission's proposal, use would be freely transferable if the purpose for which the water is used remained the same. If the purpose changes, a new permit would be required.

(6) Water should be transferable to other lands, but a special permit should be required for such transfers. Transfer permits should be issued only (a) if excess water is available, (b) if the transfer is reasonable, and (c) if the transfer will not cause substantial injury to the ecology of the area.

Appendix I

ADMINISTRATORS OF PUBLIC LANDS
1875 - 1949 736/

	<u>Minister of the Interior</u>	<u>Commission of Crown Lands</u>
1875	W. L. Moehonua	J. S. Walker, R. H. Stanley, J. O. Dominis
1876	W. L. Moehonua	J. S. Walker, Moehonua, Dominis
1877	J. Mott-Smith	Carter, Mott-Smith, Dominis
1878	J. Mott-Smith	Carter, Mott-Smith, Dominis
1879	Wilder	(Not available)
1880	Wilder	Kapena, Preston, Judd
1881	H. A. P. Carter	Carter, Walker, Judd
1882	H. A. P. Carter	Carter, Walker, Judd
1883	J. E. Bush	W. M. Gibson, E. Preston, Judd
1884	Gulick	W. M. Gibson, E. Preston, Judd
1885	Gulick	Gibson, Kapena, Judd
1886	Gulick	Gibson, Kapena, Judd
1887	L. Aholo	Gibson, Kapena, C. P. Iaukea
1888	L. A. Thurston	W. L. Green, G. Brown, Iaukea
1889	L. A. Thurston	Green, Austin, Iaukea
1890	L. A. Thurston	S. M. Damon, Austin, Iaukea
1891	C. N. Spencer	G. Brown, A. Peterson, Iaukea
1892	C. N. Spencer	S. Parker, Mott-Smith, Iaukea
1893	G. N. Wilcox	M. P. Robinson, C. Brown, Iaukea
1893	OVERTHROW OF MONARCHY	
1894	J. A. King	King, W. Smith, Iaukea
1895	REPUBLIC OF HAWAII	
1895	King	King, W. Smith, Iaukea

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		<u>Commission of Public Lands</u>
1896	King	
1897	King	King, J. Brown, Thurston
1898	King	King, J. Brown, Dodge
1899	King	King, J. Brown, Dodge
1900	A. Young	King, J. Brown
1901	TERRITORY OF HAWAII	Young, Brown

Commissioner of Public Lands

1901	J. Brown
1902	E. S. Boyd
1903	E. S. Boyd

Department of Public Lands

1904	J. W. Pratt
1905	J. W. Pratt
1906	J. W. Pratt
1907	J. W. Pratt
1908	J. W. Pratt
1909	J. W. Pratt
1910	M. Campbell

Court of Land Register

P. L. Weaver: Judge
E. Mott-Smith, C. Peterson: Examiners
Weaver: Judge
Dickey, Mott-Smith, Peterson, Monsarrat, W. Castle: Examiners
Weaver: Judge
Dickey, Mott-Smith, Peterson, Monsarrat, W. Castle, C. Hemenway: Examiners
Weaver: Judge
Monsarrat, Dickey, Hemenway: Examiners
Weaver: Judge
Dickey, Monsarrat: Examiners
Weaver: Judge
Dickey, Lightfoot, Thayer: Examiners
(Not available)

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Land Board

1911	M. Campbell	W. Kinney, J. Brown
1912	C. Judd	W. Kinney, J. Brown
1913	J. Tucker	W. Kinney, J. Brown

Land Board

1914	J. Tucker	W. Kinney, J. Brown
1915	J. Tucker	J. Raymond, J. Brown
1916	J. Tucker	J. Raymond, W. Wilder
1917	B. Rivenburg	J. Raymond, W. Wilder
1918	B. Rivenburg	C. Rice, W. Wilder
1919	B. Rivenburg	J. Brown
1920	C. T. Bailey	J. Brown
1921	C. T. Bailey	J. Brown
1922	C. T. Bailey	J. Brown
1923	C. T. Bailey	A. Castro
1924	C. T. Bailey	A. Castro

Department of Public Lands

Hawaiian Homes Commission

Land Board

1925	C. T. Bailey	Farrington (Governor)	A. Castro
1926	C. T. Bailey	Farrington (Governor)	A. Castro
1927	C. T. Bailey	Farrington (Governor)	J. W. Waldron, Castro
1928	C. T. Bailey	Farrington (Governor)	Waldron, A. Castro
1929	C. T. Bailey	Farrington (Governor)	Waldron, A. Castro
1930	C. T. Bailey	L. M. Judd (Governor)	Waldron, A. Castro
1931	C. T. Bailey	L. M. Judd (Governor)	Waldron, A. Castro
1932	C. T. Bailey	L. M. Judd (Governor)	Waldron, A. Castro
1933	C. T. Bailey	L. M. Judd (Governor)	Waldron, A. Castro
1934	C. T. Bailey	L. M. Judd (Governor)	Waldron, A. Castro
1935	C. T. Bailey	Poindexter (Governor)	Waldron, A. Castro
1936	C. T. Bailey	C. Iaukea	J. Child, Pittman
1937	L. Whitehouse	F. Krauss	J. Child, Pittman
1938	L. Whitehouse	F. Krauss	J. Child, C. Hite

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Department of Public Lands

Hawaiian Homes Commission

Land Board

1939	L. Whitehouse	F. Krauss	J. Child, C. Hite
1940	L. Whitehouse	B. McBride	J. Child, C. Hite
1941	L. Whitehouse	B. McBride	J. Child, C. Hite
1942	L. Whitehouse		A. Castro; J. Stickney
1943-	Military Government		
1947			
1948	Lester Marks		A. Castro, Stickney
1949	Lester Marks		A. Castro, Stickney

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Appendix II

GOVERNMENT LAND SALES, 1886-1888. 737/

No. R. P.	To whom.	Date.	Area.	Location.	Consideration.	Fee...
3391	T. A. L. Wills.	May 26, 1886.	1.42 acres	Maui—Kahuwai.	\$ 7 10	\$5
3392	Mailolo Wills (w).	"	5.41 "	" Niumalu.	27 05	5
3393	T. A. Wills.	"	8.02 "	" Maalo.	40 10	5
3394	Kahau (w.) et al.	July 31, 1886.	106 "	" Puukalaiipu.	*5
3395	Emalia Poepoe.	Jan. 22, 1887.	123.75 sq. ft.	Oahu—Honolulu.	125 00	5
3396	Kalama K. Kumuloa.	Jan. 14, 1887.	1276 acres	Hawaii—Olelomoana I.	50 00	5
3397	"	"	4224 "	" Papa II.	50 00	5
3399	Paul Neumann.	Feb. 17, 1887.	2 "	Oahu—Halelenu.	50 00	5
3400	Pomaikelani.	April 6, 1887.	11 ¹ / ₁₀ "	" Kulaokahua.	4,787 50	5
3403	Antone Rosa.	May 5, 1887.	43 ¹ / ₁₀ "	" Koloaloa.	500 00	5
3404	"	"	37 ¹ / ₁₀ "	" Pohakaa.	400 00	5
3405	Trustees est. Jas. Woods.	May 12, 1887.	280 "	Hawaii—Kou & Poapoa.	430 00	5
3406	"	"	98 "	" "	755 00	5
3409	Samuel Parker.	"	27 "	" Kaumoali.	588 00	5
3410	"	May 19, 1887.	22 "	" Heneheneula.	366 50	5
3412	H. Cooper.	"	7 ¹ / ₁₀ "	" "	70 00	5
3413	"	"	26 "	" "	260 00	5
3414	Samuel Parker.	May 21, 1887.	23 ¹ / ₁₀ "	" Manai & Haukoi	150 00	5
3415	Hamakua Plant. Co.	May 25, 1887.	149 ¹ / ₁₀ "	" Kamaui Kaule kohau.	1,433 00	5
Amounts carried forward.....					\$10,089 25	\$95

* \$116 50 paid into Governor's office at Maui, as per statement of August 25, 1876.

GOVERNMENT LAND SALES, 1886-1888—CONTINUED.

No. R. P.	To whom.	Date.	Area.	Location.	Consideration.	Fee...
Amounts brought forward.....					\$10,089 25	\$95
3416	Trustees est. B. P. Bishop.	July 13, 1887.	2200 acres	Hawaii—Umauma.	250 00	5
3417	Konale Markham.	Aug. 24, 1887.	1 ¹ / ₁₀ "	Oahu—Kaluaopalena.	15 00	5
3418	Antone Rodrigues.	Sept. 10, 1887.	1 ¹ / ₁₀ "	" Mahani.	200 00	5
3419	Portuguese Benefit Soc'y.	"	2 ¹ / ₁₀ "	" Honolulu.	50 00	5
3420	C. P. Iaukea, trustee.	Oct. 22, 1887.	6 ¹ / ₁₀ "	" Kalihi.	455 00	5
3421	"	"	105.741 sq. ft.	" Kulaokahua.	650 00	5
3422	Honokaa Lyceum.	"	2 ¹ / ₁₀ acres	Hawaii—Honokaa.	10 00	5
3423	C. P. Iaukea, trustee.	"	15 ¹ / ₁₀ "	Oahu—Kaloalu.	95 00	5
3424	C. P. Iaukea.	Oct. 25, 1887.	455 "	" Kamaikai.	2,010 00	5
44	Board of Education.	Jan. 7, 1888.	216.2 "	" Waialua.	5
3425	D. P. Kellett.	Jan. 24, 1888.	1 ¹ / ₁₀ "	" Kunawai.	160 00	5
3426	R. W. Meyer.	"	12 "	Molakai—Kahanui.	50 00	5
3427	Antone Rodrigues.	Mar. 23, 1888.	15 ¹ / ₁₀ "	Oahu—Mahani.	350 00	5
3428	D. H. Nahinu.	"	1 ¹ / ₁₀ "	Hawaii—Kauhako.	130 00	5
Totals.....					\$14,514 25	\$163

Appendix III

A. Summary of the Proposed Amendment to Chapter III, Honolulu Board of Water Supply Rules and Regulations (as revised, April 26, 1978)

Possible Groundwater Level Conditions:

- (1) Caution
- (2) Alert
- (3) Critical

Criteria Determining Condition Severity:

- (1) A three-month rise in chloride content according to a schedule for each level of severity experienced "at sufficient sources (facilities) to hamper operations";
- (2) Head levels below specified amounts for each level of severity at three or more of six Honolulu and five suburban measuring locations.

Board of Water Supply Action:

Caution - Appeal for voluntary conservation measures in the mass media and letters to large consumers;

Alert:

BWS Customers - Lawn, groundwater irrigation and other domestic use restrictions. Maximum monthly water allotments for the commercial, residential, industrial, military, governmental, and agricultural consumer classes, not less than 90% of their previous year's monthly average use.

Private Wells - Maximum monthly water allotment for each well or battery of wells as a percentage, not less than 90%, of the highest average daily draft for each month of the year over the last five years.

Critical - Same as for Alert except the maximum percentages are not to be less than 70% of the base quantities.

Penalties for Violations:

By any person - citations, injunctions

By BWS Customers - mandatory flow restriction devices installed at customer cost.

Surcharges for Excess Water - BWS Customers:

<u>Excess</u>	<u>Multiple of Existing Rate</u>
5,000 gal.	2
10,000 gal.	3
15,000 gal.	4
20,000 gal.	12
over 20,000 gal.	20

B. Summary of the Ground Water Use Act of 1961, Chapter 177, Hawaii Revised Statutes

The Board of Land and Natural Resources may designate groundwater areas for regulation upon its own initiative or upon petition by interested parties when, upon notice and after public hearings it finds:

- (1) The use of groundwater exceeds the rate of discharge;
- (2) Groundwater levels are declining or have excessively declined;
- (3) Chloride content of the water is increasing to a level that materially reduces the value of the use to which water is being put;
- (4) Excessive preventable waste of water is occurring;
- (5) Any proposed water development which, if constructed, would in the opinion of the board lead to one of the above conditions.

After a Groundwater Area is Designated:

- (1) Domestic uses may be continued without diminution and new domestic uses may be initiated without a permit;
- (2) Uses existing at the date of declaration, to be made in conjunction with facilities under construction at such date, or made within five years prior to the date may be continued if the use remains beneficial and a declaration of such use is filed with the board;

(3) Additional uses (including increases or changes in existing uses) require a permit from the board which may be granted if:

- (a) Water is available;
- (b) The use is beneficial;
- (c) The most beneficial use and development of the water resources of the state will not be impaired by granting the permit;
- (d) Granting the permit will not substantially or materially interfere with preserved or domestic uses.

Penalties:

- Permit revocation;
- Injunction.

FOOTNOTES

1. See pages 146-53 for a more complete description of the native Hawaiian approaches to water use and water rights.
2. This history is explained in more detail at pages 153-76.
3. For a more complete explanation of appurtenant water rights, see pages 177-79.
4. Riparian water rights, and the use of this term by the Hawaii Supreme Court, are discussed in more detail at pages 181-85.
5. These Hawaii Supreme Court cases are analyzed fully at pages 185-91.
6. Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675 (1904).
7. Carter v. Territory, 24 Hawaii 47 (1917).
8. Territory v. Gay, 31 Hawaii 376 (1930).
9. City Mill Co. v. Honolulu Sewer and Water Comm'n, 30 Hawaii 912 (1929).
10. See Justice Banks' opinion in Territory v. Gay, 31 Hawaii 376, 410-412 (1930) for a discussion of the apparent contradictions between the two cases. And see pages 191-94 for a full discussion of the City Mill case.
11. 54 Hawaii 174, 504 P.2d 1330 (1973), aff'd on rehearing, 55 Hawaii 260, 517 P.2d 26 (1973), cert. denied, 417 U.S. 962 (1974).
12. See pages 218-41 for a full discussion of the water law in selected states with water problems similar to Hawaii.
13. See pages 194-99 for a full discussion of the McBryde decision.
14. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 189 n. 15, 504 P.2d 1330, 1340 n. 15 (1973) quoted on page 143 of this report.
15. Id., cert. denied, 417 U.S. 962 (1974).
16. Robinson v. Ariyoshi, 441 F. Supp. 559 (D. Hawaii 1977). See pages 198-218 for a full discussion of this decision.
17. See pages 200-18.
18. See pages 260-67.

19. "The tenures were in one sense feudal, but they were not military, for the claims of the superior on the inferior were mainly either for produce of the land or for labor, military service being rarely or never required of the lower orders." Principles Adopted by the Board of Commissioners to Quiet Land Titles, L. 1847, in 2 Rev. Laws of Hawaii, at 2124 (1925). See also P. Chun, Sequent Occurrence in Waihe'e Valley, Oahu 21 (1954) (unpublished master's thesis, University of Hawaii).
20. E. S. Handy and E. G. Handy, Native Planters in Old Hawaii 58 (1972).
21. Id. at 57.
22. Id. at 58.
23. W. Hutchins, The Hawaiian System of Water Rights 21 (1946) (quoting from Principles Adopted by the Board of Commissioners to Quiet Land Titles, L. 1847, in 2 Rev. Laws of Hawaii, at 2124 (1925)).
24. I R. Kuykendall, The Hawaiian Kingdom 1778-1854 269 (1938). This characterization of the land as privately owned was adopted by the Hawaii Supreme Court in several of its cases:

"Originally the King was the sole owner of the water as he was of the rest of the land and could do with either or both as he pleased." Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675, 680 (1904); Territory v. Gay, 31 Hawaii 376, 385 (1930).

". . . under the ancient Hawaiian system all land belonged to the king or ruling chief who allotted tracts of land from time to time to the principal chiefs, subject to revocation at will." Territory v. Bishop Trust Co., 41 Hawaii 358, 361 (1956).
25. Handy and Handy, supra note 20, at 277.
26. Id. at 278.
27. "These districts or mokus were geographical subdivisions only, and no administrators were assigned to them. . . . At the time of the Great Mahele of 1848, the Island of Oahu was divided into: Ewa, Kona, Koolauloa, Koolaupoko, Waialua, and Waianae." J. Chinen, The Great Mahele 3 (1958).
28. "Hawaiian life vibrated from uka, mountain, whence came wood, kapa, for clothing, olona, for fish line, ti-leaf for wrapping paper, 'ie for ratan lashing, wild birds for food, to the kai, sea, whence

- came ia, fish, and all connected therewith." M. Kelly, Changes in Land Tenure in Hawaii, 1778-1850 at 20 (1956) (unpublished master's thesis, University of Hawaii) (quoting C. J. Lyons, Land Matters in Hawaii 1 The Islander 111 (1875)).
29. Levy, Native Hawaiian Land Rights, 63 Cal. L. Rev. 848, 849 (1975).
30. "They were also called 'ili'aina or 'ilipa'a (long narrow strip of land complete within itself)." Kelly, supra note 28, at 22.
31. Id. at 24.
32. "This class may be divided into three groups in accordance with the role each performed in the economic life of the community. . . . (1) The highest ranking of the three groups was composed of individuals and their families who had leadership qualities and were skilled farmers, fishermen, or craftsmen. . . . (2) The second group also included farmers and fishermen, but these lacked the leadership qualities apparent in the first group. . . . (3) The third subdivision was composed of individuals who apparently labored little, produced least, and are described by Hawaiian historians as irresponsible and shiftless." Id. at 27-28.
33. Levy, supra note 29, at 849.
34. D. Malo, Hawaiian Antiquities 53 (Bishop Museum ed. 1951).
35. Id. at 53-54, 58.
36. Handy and Handy, supra note 20, at 63.
37. Id.
38. Id.
39. Kelly, supra note 28, at 42.
40. Levy, supra note 29, at 849.
41. J. Wise, The History of Land Ownership in Hawaii, in Ancient Hawaiian Civilization 85 (1965) (a series of lectures delivered at the Kamehameha Schools).
42. Malo, supra note 34, at 204.
43. S. Kamakau, Works of the People of Old 23 (1976).
44. Chun, supra note 19, at 49.
45. Id. at 32, 33.
46. Handy and Handy, supra note 20, at 63.

47. Id.
48. Id.
49. Malo, supra note 34, at 204.
50. Two Hawaiian Supreme Court cases offer divergent interpretations of this practice of running water through taro patches:
- (a) Peck v. Bailey, 8 Hawaii 658, 671 (1867):
- "It is very true that irrigation early claimed the attention of the cultivators of the soil on these islands, not only from the fact of its being a necessity on most of the land, but from the fact that [taro] required flowing water . . ." (emphasis added).
- (b) Lonoaea v. Wailuku Sugar Co., 9 Hawaii 651, 663 (1895):
- In speaking of the continuous flow of water through the irrigation system, the court in Lonoaea stated: "It would be wasteful, for neither [taro] nor cane require a continuous flow of water upon them." (emphasis added).
- Another source has the following to say of the taro culture:
- "Location of Land: . . . without a sufficient supply of good running water, taro cannot be grown to advantage. Stagnant water must be avoided . . .
- * * *
- "Irrigation: Water that is kept actively circulating is best for the taro. If stagnant water must be used it should be agitated or changed as often as possible."
- D. Akana, The Production of Wet Land Taro (1932) (Hawaii University Agricultural Extension Service, No. 16).
- Two explanations for these different opinions are that (a) many varieties of taro exist, requiring different growing conditions, and (b) growing conditions vary according to the different terrain and rainfall of the different parts of the islands.
51. Malo, supra note 34, at 205.
52. E. Nakuina, Ancient Hawaiian Water Rights, in Thrum's Hawaiian Almanac and Annual, 1894 at 79.

- 53. Originally, the konohiki was subservient to the chief or alii within the ahupuaa or ili. The chief usually appointed the konohiki to administer the details of water use throughout the ahupuaa. Later writings, cases, and statutes used interchangeably the terms "konohiki" and "chief." They both have come to mean the landlord of the ahupuaa.
- 54. Hutchins, Hawaiian System, supra note 23, at 102.
- 55. Nakuina, supra note 52.
- 56. Id.
- 57. A. Perry, A Brief History of Hawaiian Water Rights 6 (1912) (unpublished speech read at the annual dinner of the Hawaii Bar Association).
- 58. This beneficial use of water in the hands of the maka'ainana parallels the systems among the western states that operate under the doctrine of appropriation. See generally, H. Wadsworth, A Historical Summary of Irrigation in Hawaii, in 37 Hawaiian Planters' Record 131 (1933).
- 59. Nakuina, supra note 52, at 80.
- 60. Perry, supra note 57, at 6.
- 61. Id.
- 62. Wadsworth, supra note 58, at 131; Wadsworth wrote that "the distribution seems to have been based upon the idea of rotation and not continuous delivery, although a continuous flow seems to be ordinarily used for taro irrigation in modern practice." (See also footnote 50, supra).
- 63. Id.
- 64. Nakuina, supra note 52, at 83:

"[Ancient] water right were primarily for lois, that is, for [taro] culture." Chief Justice Perry pointed out that domestic uses also had a high priority under the early system:

"Water for domestic purposes on a lower ahupuaa is in any event assured under Hawaiian law. Every portion of land, large or small, ahupuaa, ili or kuleana, upon which people dwelt was, under the ancient Hawaiian system . . . entitled to water for other domestic purposes." Territory v. Gay, 31 Hawaii 376, 395 (1930).
- 65. Wadsworth, supra note 58, at 132.

- 66. Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675, 680 (1904).
- 67. See pages 186-87, 189, and 191 for more discussion of this case.
- 68. Perry, supra note 57, at 7.
- 69. Handy and Handy, supra note 20, at 61.
- 70. Id.
- 71. Perry, Hawaiian Water Rights, in Thrum's Annual, 1912 at 90.
- 72. Hutchins, Hawaiian System, supra note 23, at 22.
- 73. Arthur Alexander, Land Titles and Surveys in Hawaii 68 (paper read before the Honolulu Social Science Association, March 1, 1920).
- 74. Robert King, Hawaiian Land Titles, in First Progress Report of the Territorial Planning Board 43 (1939).
- 75. Hutchins, Hawaiian System, supra note 23, at 22.
- 76. "[Kalanimoku] then addressed the chiefs. And after setting forth the defects of the laws and customs among them, he especially referred to the inconveniences arising from the reversion of lands to the king on the death of their occupants, a custom revived under [K]amehameha II, but which it had been the object of [K]amehameha I to exchange for that of hereditary succession. This project of their great king he proposed to adopt as the law, excepting in such cases as when a chief or landholder should infringe the laws; then his lands should be forfeited. . . ." R. Kuykendall, The Hawaiian Kingdom, 1778-1854 119 (1938).
- 77. Hutchins, Hawaiian System, supra note 23, at 22.
- 78. Hawaii Const. of 1840 (Exposition of the Principles on Which the Present Dynasty is Founded) in Fundamental Law of Hawaii 3 (Thurston ed. 1904). The Constitution stated:

"Kamehameha I, was the founder of the kingdom, and to him belonged all the land from one end of the Islands to the other, though it was not his own private property. It belonged to the chiefs and people in common, of whom Kamehameha I was the head, and had the management of the landed property. Wherefore, there was not formerly, and is not now any person who could or can convey away the smallest portion of land without the consent of the one who had, or has the direction of the kingdom." (emphasis added)
- 79. Id. at 3.

80. The Preamble to the Constitution of 1840 (Declaration of Rights of 1839) stated:
- "Protection is hereby secured to the persons of all the people, together with their lands, their building lots, and all their property, while they conform to the laws of the kingdom, and nothing whatever shall be taken from any individual except by express provision of the law." Id. at 1.
81. Kuykendall, supra note 76, at 277.
82. Id. at 278.
83. Id. at 278-79.
84. Id.
85. Law Creating the Board of Commissioners to Quiet Land Titles, in Fundamental Laws of Hawaii 137 (Thurston ed. 1904).
86. Id. sec. 9, at 139.
87. Id. sec. 10.
88. Principles Adopted by the Board of Commissioners to Quiet Land Titles, in Their Adjudication of Claims Presented to Them, in Fundamental Laws of Hawaii 140 (Thurston ed. 1904).
89. Levy, supra note 29, at 854.
90. Id.; Kuykendall, supra note 76, at 280.
91. Levy, supra note 29, at 854.
92. Principles Adopted by the Board of Commissioners, supra note 88, at 142-143.
93. Kuykendall, supra note 76, at 287.
94. Levy, supra note 29, at 854.
95. R. Apple and P. Apple, The Great Mahele, Honolulu Star-Bulletin, June 16, 1978, at A-19, col. 6.
96. R. Schmitt, Historical Statistics of Hawaii 298 (1977).
97. Kuykendall, supra note 76, at 289.
98. Kelly, supra note 28, at 118.
99. R. Schmitt, Demographic Statistics of Hawaii 1778-1965 at 36-37 (1968).

100. Id. at 10.
101. Reprinted with the permission of Robert Schmitt from Historical Statistics of Hawaii, supra note 96, at 298.
102. Kuykendall, supra note 76, at 297.
103. S. Dole, Hawaiian Land Policy, in Thrum's Hawaiian Annual, 1898 at 125.
104. Laws of 1842, in Fundamental Laws of Hawaii 29-30 (Thurston ed. 1904).
105. Principles Adopted by the Board of Commissioners, supra note 88, at 144-45.
106. McBryde Sugar Co. v. Robinson, 504 P.2d 1330, 1338, 54 Hawaii 174, 186 (1973).
107. Enactment of Further Principles, in 2 Rev. Laws of Hawaii at 2142 (1925).
108. 54 Hawaii at 192-93, 504 P.2d at 1342.
109. 54 Hawaii at 205, 504 P.2d at 1348 (Marumoto, J., dissenting), and 55 Hawaii at 270, 517 P.2d at 32 (Levinson, J., dissenting).
110. King, supra note 74, at 42.
111. G. Daws, Shoal of Time 174-75 (1968).
112. A. Lind, An Island Community: Ecological Succession in Hawaii 166 (1939).
113. Daws, supra note 111, at 208.
114. Id. at 312.
115. King, supra note 74, at 42.
116. L. Whitehouse, Public Lands, in First Progress Report of the Territorial Planning Board 49 (1939).
117. Id.
118. P. Thompson, Kahaluu and the Development of Windward Oahu 2 (Hawaii Observer Reprint No. 1).
119. L. H. Fuchs, Hawaii Pono: A Social History 251 (1961).
120. Id. at 252-53.

121. R. H. Horowitz, Public Land Policy in Hawaii: Major Landowners 13 (Legislative Reference Bureau, 1967).
122. Thompson, supra note 118, at 4.
123. Wadsworth, supra note 58, at 146.
124. Thompson, supra note 118, at 3.
125. J. M. Lydgate, The Vanishing Kuleana, in Thrum's Hawaiian Annual, 1915 at 107.
126. Robinson v. Ariyoshi, 441 F. Supp. 559, 574 (D. Hawaii 1977).
127. Id. at 576.
128. Wadsworth, supra note 58, at 139.
129. The state archives in Honolulu contain only the proceedings for the Kona (South) District of Oahu from 1859 to 1887. Many of the early controversies were recorded in Hawaiian.
130. Hutchins, Hawaiian System, supra note 23, at 54.
131. See pages 158-59.
132. Schaefer v. Kekiipio, 2 Records of Commission of Private Ways and Water Rights 316 (Oahu, Kona District, 1885).
133. Wadsworth, supra note 58, at 140.
134. L. Watson, Summary of History of East Maui Water Licenses and East Maui Irrigation Company, Ltd., and Predecessors, (appendix to an unpublished report entitled Land and Water Rights of Maui, 1973, obtained from the Department of Land and Natural Resources).
135. Id.
136. Wadsworth, supra note 58, at 1.
137. See generally, J. Adler, Claus Spreckels, The Sugar King in Hawaii 33-51 (1966) and R. Apple and P. Apple, Politics of Water in the Kingdom, Honolulu Star-Bulletin, Sept. 15, 1978, at A-14, col. 3.
138. Watson, East Maui, supra note 134, at 20.
139. M. Rho, Water Saga of Central Maui (reprint from 8 Ampersand, No. 3, at 44 (1972)).
140. Id. at 45.
141. Id.

142. A Fresh Idea Pays Off in Maui, 13 CH₂M HILL Quarterly, No. 1 (1975).
143. Department of Land and Natural Resources, General Leases No. S-3695 (Feb. 1962), S-3578 (Aug. 1959), S-3505 (Nov. 1954), and S-3349 (Nov. 1950), at 1 and 2 of each.
144. Id. Honomanu Lease G.L. S-3695 (Feb. 1962) at 11.
145. The 1938 East Maui Water Agreement illustrates how the price of water fluctuated with the price of sugar. If the average price per pound of raw sugar exceeded 3¢, then payment for water increased at a rate of 3% for every one-tenth of a cent increase above 3¢ but below 4¢. If the price of sugar exceeded 4¢ a pound, a predetermined maximum amount for water, as set down in the agreement, prevailed. These amounts ranged between \$.95 at Nahiku to \$2.10 at Honomanu (Department of Land and Natural Resources, East Maui Water Agreement (1938), at 5-6). These figures reflect 1938 prices and are no longer part of current water license negotiations.
146. Interview with Manabu Tagamori, Department of Land and Natural Resources, Sept. 1978.
147. Maui County Water Dept., A Brief Summary of State Water Licenses on Maui 2 (April 1961).
148. Id.
149. Id. at 5.
150. Id.
151. Robert Chuck (DLNR), Resale Cost of Water Under EMI State Water License, 1 (memorandum to Attorney General, April 27, 1973).
152. Id.
153. L. Watson, The Lands and Water Rights of Kauai, 2-68 to 2-71 (Dept. of Land and Natural Resources, June 1972).
154. See, e.g., Territory v. Gay, 31 Hawaii 376 (1930).
155. Wadsworth, supra note 58, at 147.
156. Watson, Kauai, supra note 153, at 2-69.
157. Id. at 2-70.
158. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 177, 504 P.2d 1330, 1334 (1973).
159. Thrum's Annual, 1907 at 115.
160. Id.

161. Id. at 116.
162. Id.
163. Interview with Ralph Yukumoto, Department of Health, July 1978.
164. Public Utilities Commission, Decision No. 9, at 3 (1921).
165. Id.
166. Id. at 7.
167. Id. at 22.
168. Dept. of Land and Natural Resources, Report on State Owned Waters and Facilities at North Kohala Hawaii 5 (1965).
169. Interview with Ralph Yukumoto, supra note 163.
170. Wadsworth, supra note 58, at 150.
171. Id. at 155.
172. L. H. Herochler, Fifty Years of Water Service 4 (Waiahole Water Company, 1966).
173. Id.
174. The Waiahole Tunnel Project, Thrum's Annual, 1916 at 174.
175. Wadsworth, supra note 58, at 156.
176. Department of Land and Natural Resources, Water Resources of Windward Oahu, Hawaii 102 (1969).
177. J. Blount, Report of the Committee on Foreign Relations, U.S. Senate 1782-1783 (1894).
178. Fuchs, supra note 120, at 22.
179. Id. at 154.
180. Daws, supra note 111, at 313.
181. P. H. Mulholland, Land Court Registration, in First Progress Report of the Territorial Planning Board 45 (1939).
182. Id.
183. Id. at 47.
184. Thompson, supra note 118, at 3.

185. Id.
186. Id.
187. This section has benefited from the work of many commentators. In addition to those cited in the footnotes that follow, we have particularly benefited from the work of George Cooper, who has been working on this subject for the Legal Aid Society, and from the work of Paul Fong, whose seminar paper at the University of Hawaii Law School (Spring, 1978) was entitled Robinson v. Ariyoshi: Can Federal Judge Martin Pence Be Right?
188. Territory v. Gay, 31 Hawaii 376, 395 (1930), aff'd, 52 F.2d 356 (9th Cir. 1931), cert. denied, 284 U.S. 677 (1931).
189. See, e.g., Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675, 680 (1904); Territory v. Gay, 31 Hawaii 376, 385 (1930); Territory v. Bishop Trust Co., 41 Hawaii 358, 361 (1956).
190. See pages 146-53 of this report ("The Ancient Hawaiian Water System").
191. R. N. Anderson, et al., Water as a Factor in Growth Management, in Growth Management Issues in Hawaii 116 (Hawaii Institute for Management and Analysis in Government, 1977).
192. City Mill Co. v. Honolulu Sewer and Water Comm'n, 30 Hawaii 912 (1929). See pages 191-94 for a full discussion of this case.
193. Perry, supra note 39, at 3.
194. City Mill Co. v. Honolulu Sewer and Water Comm'n, 30 Hawaii 912, 928 (1929).
195. See Territory v. Gay, 31 Hawaii 376 (1930). See pages 187-91 for a full discussion of this case.
196. Id. at 395.
197. Hutchins, Hawaiian System, supra note 23, at 102.
198. Carter v. Territory, 24 Hawaii 47, 57-58 (1917).
199. Hutchins, Hawaiian System, supra note 23, at 102.
200. Id.
201. The Hawaii Supreme Court stated this distinction clearly in Territory v. Gay, 31 Hawaii 376, 383-84 (1930):

"In these latter instances [referring to 'appurtenant' rights] the adjudication that the lands had water rights was not dependent upon any use with continuity or hostility for any particular period of time but merely followed from the fact that just prior to the grant of the awards water was being used on those lands, presumably by right. These are the rights which in this opinion are called 'appurtenant' as distinguished from 'prescriptive'."

202. Peck v. Bailey, 8 Hawaii 658 (1867).

203. Id. at 661 (emphasis added). Chief Justice Allen, in the Peck case, uses the term "prescription" or "prescriptive" two ways:

1. "There can be no difference of opinion that the complainants were entitled to all the water rights which the lands had by pre-scription at the date of their title." (emphasis added; at 661) The Peck opinion included the passage above in the context of appurtenant water rights: water rights gained by immemorial usage in the watering of taro patches.
2. Regarding waste waters that flowed from the taro patches into a ditch, then flowed onto complainants' property: "The question is whether it was such a use as would give a prescriptive right." (emphasis added; at 668) In this context, Allen examines the basic elements of a classical prescriptive claim: actual, open and notorious, hostile, continuous, and exclusive use of the water.

204. Peck v. Bailey, 8 Hawaii 658 (1867), involved a controversy between two landowners in the single ahupuaa of Wailuku, on the Island of Maui. The Wailuku River was the main natural watercourse in the ahupuaa. Three major ditches drew water from the river. They included the Kalaniauwai, the ditch farthest upriver; the Kamaauwai, situated below the Kalaniauwai; and the mill watercourse, which diverted water downriver from the ditches mentioned above.

The complainants owned a sugar plantation and sugar mill on the Wailuku River. They alleged that the defendant illegally and wrongfully diverted more water from the river than he was entitled to. The complainants contended that such diversion caused great interruption to the function of the mill and injury to their sugarcane. They further alleged that the defendants illegally

diverted water to kula or uncultivated lands within the same ahupuaa.

Defendant recognized the title to the land occupied by the complainants. He denied, however, complainants' right as lord paramount of Wailuku River. Defendant claimed that he had not used more water than he was entitled to by immemorial usage.

Given these allegations and facts, the court in Peck v. Bailey had to decide whether either or both parties enjoyed appurtenant water rights, and whether defendant could rightfully extend appurtenant water to kula lands.

Chief Justice Allen maintained that both parties to the controversy obtained properties that originated from the same source: the grantor whose ancestor was the konohiki of this ahupuaa. The konohiki originally enjoyed rights to the river subject to the rights of the tenants. The Land Commission confirmed these tenant rights that included certain taro patches and the water necessary for their cultivation. (Id. at 662)

The court decided that because both parties received their lands from the same grantor, neither could be lord paramount over the Wailuku River. Both parties were limited to waters appurtenant to their lands, neither having exceptional water rights. (Id. at 663)

205. 8 Hawaii at 666:

The Court is of opinion, . . . that the defendant had the right to use the water of his [taro] land on other lands, if in the transfer or passage of water over his own land no injury was done to others. He is limited to the same quantity of water to which he was entitled on his [taro] land by immemorial usage.

206. 15 Hawaii 675 (1904).

207. Id. at 691.

208. Black's Law Dictionary 133 (revised 4th ed. 1968): "Appurtenant: Belonging to, accessory or incident to; adjunct, appendaged, or annexed to."

209. Territory v. Gay, 31 Hawaii 376, 383-384 (1930):

"The same term has, however, sometimes been used to denote or to include rights not shown to have been acquired adversely or by prescription but which were being enjoyed by and regarded as appurtenant to certain lands at the date when those lands first passed into private ownership

by the generosity of the king and with the administrative assistance of the land commission."

- 210. Hutchins, Hawaiian System, supra note 23, at 108:
 "The ancient uses of water in Hawaii by taro (kalo) cultivators were not hostile to the konohiki, by any means; they were made with his permission, with water distributed through systems that he controlled."
- 211. Peck v. Bailey, 8 Hawaii 658, 661 (1867) (emphasis added); compare this use to quotation 2 in footnote 203, supra.
- 212. Id. (emphasis added).
- 213. Lonoaea v. Wailuku Sugar Co., 9 Hawaii 651 (1895).
- 214. Id. at 660.
- 215. Id. at 662.
- 216. 15 Hawaii 675 (1904).
- 217. The question whether appurtenant rights and prescriptive rights were adjudicated in the Lonoaea decision divided the justices on the court and persisted after the decision. Justice Frear, dissenting in Lonoaea, claimed that "the day right, appurtenant to the company's lands, . . . is limited to the amount of water actually taken by day on those lands for twenty years." 9 Hawaii at 669 (emphasis added).

The Hawaii Supreme Court finally held in 1904 that the judgment in Lonoaea was a complete adjudication as to waters covered by prescriptive rights:

"In our opinion, all of the respondent's prescriptive rights were adjudicated, including in the term prescriptive as here used the rights appurtenant to taro land. The right of taro lands to water has generally, . . . been regarded and referred to by our courts as well as by parties as a prescriptive right acquired against the konohiki in the manner in which such rights can be acquired." (Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675, 683 (1904))

The court subsequently denied a motion for the rehearing of the prescriptive issue. It asserted that ancient appurtenant rights had been included in rights by prescription, regardless of the technical inaccuracy of the terms. (16 Hawaii 113, 115-16).

- 218. In Davis v. Afong, 5 Hawaii 216 (1884), some of the plaintiffs' witnesses testified that water had been taken "furtively," and therefore plaintiff argued that the defendant acquired no prescriptive right to such water. (Id. at 221.) The defendant held certain parcels of land in Waialua, on the Island of Oahu, which contained several springs or ponds. From the largest pond extended an auwai that continued to the plaintiffs' properties. The defendant also owned several patches adjacent to the ponds, but fed from the main auwai. The plaintiff argued that these adjacent patches were not entitled to water by prescription because they were originally watered at irregular intervals.

 The court, however, was not concerned by the irregularity or furtiveness of the taking. Although the defendant did not draw water to the respective patches during stated periods of time, the Davis court maintained that such taking was by a sufficiently long and adverse open use. The court based this finding upon a general principle "that a land-owner is entitled to the use of the water originating upon his land, subject only to the rights which others may acquire by prescription." (Id.)
- 219. Hutchins, Hawaiian System, supra note 23, at 112.
- 220. 1870 Hawaii Laws ch. 22, sec. 1.
- 221. 1898 Hawaii Laws Act 19, sec. 1.
- 222. Hawaii Rev. Stat. sec. 657-31 (1977).
- 223. Hawaii Const. art. 16, sec. 12 (added in 1978).
- 224. Lonoaea v. Wailuku Sugar Co., 9 Hawaii 651 (1895).
- 225. Id. at 662.
- 226. Hutchins, Hawaiian System, supra note 23, at 114.
- 227. Id. at 117.
- 228. Territory v. Gay, 31 Hawaii 376, 396-397 (1930). For a discussion of the riparian doctrine in other states, see pages 220-22.
- 229. Id. at 396.
- 230. Id. at 397.
- 231. Id.
- 232. Black's Law Dictionary 1712 (revised 4th ed. 1968): "Usufruct: The right of enjoying a thing, the property of which is rested in another, and to draw from the same all the profit, utility, and advantage which it may produce, provided it be without altering the substance of the thing."

- 233. Territory v. Gay, 31 Hawaii 376, 397 (1930).
- 234. C. Meyers, Water Resource Management 53 (1971).
- 235. 5 R. Powell, Real Property 364-366 (1977).
- 236. Id. at 362-363.
- 237. City Mill Co. v. Honolulu Sewer & Water Comm'n, 30 Hawaii 912 (1929).
- 238. Id. at 923.
- 239. Id.
- 240. Id. at 925.
- 241. Peck v. Bailey, 8 Hawaii 658, 670 (1867); see footnote 204, supra. The complainants were owners of a sugar plantation and mill situated in the ahupuaa of Wailuku, on the Island of Maui. Their major contention was that the defendant, another sugar grower, had wrongfully extended an auwai and diverted the water to kula lands within the same ahupuaa. The complainants alleged that this diversion had injured their mill and cane. The defendant admitted that he had dried some of his taro lands and had transferred the same water to another portion of his cane land, which he believed he had a legal right to do.

Because the case directly involved appurtenant taro water rights, Allen's discussion of the riparian principle is dicta. Nevertheless, the dicta does illustrate certain philosophies of the court. It appeared that by the deed to the land of the complainants, a small portion of their larger acreage bordered on the Wailuku River. The court chose not to apply the riparian concept to this small portion. The rights enjoyed by the Kalaniauwai offered more than would have been provided by riparian principles.
- 242. Id. at 661-662.
- 243. Id.
- 244. Id. at 671 (emphasis added).
- 245. Id.
- 246. 5 Hawaii 216 (1884).
- 247. The defendant owned parcels of land which contained several springs or ponds in Waialua, Oahu. The defendant also owned taro patches adjacent to these springs. Hence, the defendant advocated the general principle that a landowner is entitled to the use of water that originates upon his land, subject only to rights acquired by adverse use or prescription. The evidence further showed that

water went from these springs to an auwai in known and ascertained channels. The auwai had been transporting water to the plaintiffs' lands for over twenty years. Plaintiffs complained that the defendant diverted waters that normally flowed from the springs into the auwai. They claimed that by adverse possession they had a right to the usual flow of the water in the auwai.

The Davis court suggested that the applicable principle was the riparian doctrine, and that the controlling fact was whether the water flowed in an ascertained course. The court quoted a British property authority and said:

"The controlling circumstance is not whether the stream was above or below ground, but whether it was or was not ascertained and defined as a stream. If there is a natural spring, the water from which flows in a natural channel, it cannot be lawfully diverted by anyone to the injury of riparian proprietors." (5 Hawaii at 223; emphasis added).

The court thus confirmed that a right by prescription or adverse possession could be acquired to waters of a spring that come to the surface and that flow into an auwai constructed for the express purpose of transferring water to lands where it may be used for irrigation. Davis ultimately held that the plaintiffs had acquired a right by prescription to the water flowing from the springs in question to the auwai. Taro patches on both sides of the auwai naturally had priority over the prescriptive waters. (Id. at 224)

- 248. 24 Hawaii 47 (1917).
- 249. The case involved many questions, including the abandonment of water rights, ancient appurtenant rights, rights to drinking water declared by statute, superiority of domestic use over irrigation use, proportional diminution of use in time of water shortage, and changes in the method of diversion. Most of the opinion is devoted to these questions. See generally, Hutchins, Hawaiian System, supra note 23, at 90.
- 250. Carter v. Territory, 24 Hawaii 47, 57 (1917) (citing Rev. Laws of Hawaii, sec. 1 (1915)).
- 251. Id. at 64.
- 252. Id. at 67.
- 253. Id. at 70. The Waikoloa Stream originated on territory land, and flowed partly upon territory land, partly upon the land of the petitioner, and partly along the boundary between the two parties. The stream had from time immemorial been tapped by a number of ditches or auwais. The weight of the evidence also showed that in

order to satisfy the primary domestic rights to water of the petitioner and individual respondents virtually all the waters in the Waikoloa Stream had to be claimed and only a small quantity remained available for other uses. The evidence further showed that no persons had been living on the territory's land of Lolamilo below Lihue for forty or fifty years and that during that time, no water had been used for irrigation thereon. (Id. at 62)

- 254. Id. at 70. The court seems to have been using the terms "storm or freshet waters" and "surplus waters" interchangeably. Earlier in the opinion, the court held that "the surplus, after satisfying all rights for domestic use, would be available for irrigation on the lands of the petitioner." (Id. at 68; emphasis added) Such confusion in the terms has limited the court's holdings, see text at pages 187-91.
 - 255. Id. at 70.
 - 256. Hutchins, Hawaiian System, supra note 23, at 91; Territory v. Gay, 31 Hawaii 376, 396-397 (1930).
 - 257. Hutchins, Hawaiian System, supra note 23, at 91.
 - 258. 31 Hawaii 376 (1930), aff'd, 52 F.2d 356 (9th Cir. 1931), cert. denied, 284 U.S. 677 (1931).
 - 259. Id.
 - 260. Nakuina, supra note 52, at 83.
 - 261. Territory v. Gay, 31 Hawaii 376 (1930), preceded by Territory v. Gay, 26 Hawaii 382 (1922), and Territory v. Gay, 25 Hawaii 651 (1920).
 - 262. The case of Peck v. Bailey, 8 Hawaii 658 (1867) (see footnotes 204 and 241, supra), specifically adjudicated ancient appurtenant water rights. The court in Peck also spoke of riparian rights in dicta. The opinion stated that the King originally owned the ahupuaa of Wailuku, and that his conveyance of portions of the land included the auwais used from time immemorial and the rights in the stream upon which the lands bordered. Unfortunately, Peck did not expound on these rights in the natural stream. These rights, presumably riparian rights, referred to surplus waters or perhaps those waters that stayed in the natural stream after the several landowners acquired their appurtenant waters. But exactly how the court intended to identify this surplus was not included in the decision.
- Davis v. Afong, 5 Hawaii 216 (1884) (see footnote 247, supra), discussed the rights of the konohiki in ancient times to use, as he pleased, the water that originated from springs upon his own property. The konohiki's right was subject only to those rights that others may have acquired by prescription or an appurtenant right. Again, the Hawaii Supreme Court failed to define the waters

- to which the konohiki or landowner had rights. We may assume that the court intended for the konohiki to have rights to surplus waters from the springs that emerged on his property. Nevertheless, the basic question remained: What kind of surplus water?
- 263. 9 Hawaii 651 (1895).
 - 264. Id. at 659; emphasis added.
 - 265. Id.
 - 266. 14 Hawaii 50 (1902).
 - 267. Id. at 61. The plaintiff, a California corporation, sought to restrain the defendant from diverting water from the Wailuku Stream on the island of Maui. The plaintiff owned the greater part of the ahupuaa of Wailuku and various kuleanas therein. The defendant, a Hawaii corporation, owned a considerable portion of the arable land and numerous kuleanas in the same ahupuaa.
 - 268. Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 14 Hawaii 50, 63 (1902):

"It would indeed have been strange if the court had intended to adjudicate rights to so-called surplus water without more explicit language. Such rights are fast becoming of very great importance and their adjudication would involve questions of great difficulty. Moreover, the question of the right to such water has been a mooted question suggested in numerous cases that have come before this court and always recognized as one of great difficulty, and this court has carefully avoided passing upon it until compelled to do so and has always regarded it as an unsettled question."
 - 269. Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675 (1904).
 - 270. 31 Hawaii 376 (1930).
 - 271. 15 Hawaii at 680.
 - 272. Id.
 - 273. Id. at 683. See the earlier discussion of the confusion involving these terms, footnotes 203 and 209, supra, and text at pages 179-81.

274. Id. at 680-681:

"Originally the King was the sole owner of the water as he was of the rest of the land and could do with either or both as he pleased. In later years, the rule seems to have been for him not to dispossess tenants of their lands except for cause and to that extent, perhaps, he would not have deprived cultivators of the water to which their lands were by usage entitled. But no limitation, so far as we can learn, ever existed or was supposed to exist to his power to use the surplus waters as he saw fit."

The court supported this view with reference to Peck v. Bailey, 8 Hawaii 658, 661 (1867):

"By the deed, the water courses were conveyed and a right to the water accustomed to flow in them. . . . If any of the lands were entitled to water by immemorial usage, this right was included in the conveyance as an appurtenance. . . . But if lands had no such rights, and no additional grant of water rights was made, it certainly could take nothing by having been a portion of the Ahupuaa."

275. See pages 146-53 of this report.

276. 15 Hawaii at 680-81.

277. 24 Hawaii 47 (1917).

278. Id. at 70.

279. 31 Hawaii 376 (1930).

280. Id. at 393-394.

281. Id. at 404-408.

282. Id. at 408-417.

283. See 24 Hawaii at 70-71.

284. Id. at 380-381. See page 147 of this report. Gay (1930) derived this principle from the late Chief Justice Judd who described the situation in the case of Harris v. Carter, 6 Hawaii 195, 206-207 (1877):

"There are two kinds of ilis. One, the ili of the ahupuaa, is a mere subdivision of the ahupuaa for the convenience of the chief holding the ahupuaa, . . . The other class were the 'ili kupono'. These were independent of the ahupuaa, nor did they pay general tribute to it."

The valleys of Koula and Manuahi were held to be ilis kupono, independent of the ahupuaa of Hanapepe.

285. The facts of Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675 (1904), are also similar in that the 1904 case also involved the rights of upper and lower landowners to surface waters. No water in Hawaiian Commercial was diverted out of the ahupuaa, however, and so the Carter court did not view Hawaiian Commercial (1904) as a governing precedent.

286. Carter v. Territory, 24 Hawaii 47, 70 (1917).

287. Honolulu Advertiser, March 13, 1943, at A-3, col. 6.

288. Territory v. Gay, 31 Hawaii 376, 393 (1930).

289. Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675, 680 (1904).

290. Territory v. Gay, 31 Hawaii 376, 391, quoting from Carter v. Territory, 24 Hawaii 47, 70 (1917).

291. 24 Hawaii at 71.

292. Justice Parsons' opinion concurring in part and dissenting in part emphasizes also the distinction between "the surplus normal flow" and "the surplus flood and freshet waters" (31 Hawaii at 407), and his separate opinion is based on this distinction. The Carter court, however, does not appear to have used the concept of "the surplus normal flow" (24 Hawaii at 71) in the same sense that Justice Perry used that concept in the Hawaiian Commercial opinions (14 Hawaii at 61 (1902) and 15 Hawaii at 680 (1904)) and in Gay (31 Hawaii at 385-388). Justice Perry used "surplus" waters to refer to all waters not covered by appurtenant, prescriptive, or riparian rights, and felt that the konohiki had unlimited discretion to use this "surplus" and divert it out of the original watershed. The Carter court said that a landowner of a water source did have rights to the "surplus normal flow" but that this right was limited in quantity to the amount of water "to which the lands owned by him were entitled for such purposes by custom at the time the lands first passed into private ownership." As thus restricted by the Carter court, this concept is closer to an appurtenant right tied to the land than to Perry's unlimited right to divert.

293. Territory v. Gay, 31 Hawaii 376, 395 (1930).

294. See pages 183-85 and footnotes 241-258, supra.

295. See pages 156 and 159.

296. See McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 192, 504 P.2d 1330, 1344 (1973).

297. Territory v. Gay, 31 Hawaii 376, 399 (1930).
298. Id. at 397.
299. Id. at 398.
300. Id.
301. Id. at 403. See also the discussion of riparian principles on pages 183-85.
302. Id. Although Perry ultimately rejected the principle of riparian rights as applied in Carter, he did acknowledge that landowners of a lower ahupuaa did have some rights to water for domestic purposes. He agreed that "Every portion of land . . . upon which people dwelt was . . . entitled to drinking water for its human occupants and for their animals and was entitled to water for other domestic purposes. At no time in Hawaii's judicial history has this been denied." Id. at 395. Perry probably acknowledged this right to domestic water in recognition of the Laws of 1850 or "Enactment of Further Principles." The 1850 law provided that "the people [meaning owners of land] also shall have a right to drinking water and running water and the right of way." See pages 156 and 159.
303. Id. at 409.
304. 30 Hawaii 912.
305. Territory v. Gay, 31 Hawaii 376, 412 (1930).
306. Id.
307. Id. at 413.
308. 30 Hawaii 912 (1929).
309. Hutchins, Hawaiian System, supra note 23, at 145-147.
310. Id. at 224.
311. Territory v. Gay, 31 Hawaii 376, 403 (1930).
312. 1925 Hawaii Laws Act 150.
313. City Mill Co. v. Honolulu Sewer and Water Comm'n., 30 Hawaii 912, 913 (1929).
314. Id. at 915.
315. Id. at 922.
316. Id. at 925.
317. Id. at 927.
318. Id. at 922.
319. Id. at 924.
320. Id. at 923.
321. Id. at 934.
322. Id. at 935.
323. Territory v. Gay, 31 Hawaii 376, 412 (1930).
324. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 180, 504 P.2d 1330, 1335 (1973).
325. The clearest holding on this question was Territory v. Gay, 31 Hawaii 376 (1930).
326. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 504 P.2d 1330 (1973), aff'd on rehearing, 55 Hawaii 260, 517 P.2d 26 (1973), cert. denied, 417 U.S. 962 (1974).
327. See pages 147 and 188 and note 284, supra, for an explanation of these Hawaiian terms.
328. For a more complete explanation of these terms, see pages 185-91.
329. See pages 154-160 for a more complete explanation of the Great Mahele.
330. 1847 Hawaii Laws sec. 85; 2 Rev. Laws of Hawaii at 2124, 2128 (1925); see text at pages 155-56 and 159.
331. Id.
332. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 186, 504 P.2d 1330, 1338 (1973).
333. Id. at 187, 504 P.2d at 1339.
334. McBryde Sugar Co. v. Robinson, aff'd on rehearing, 55 Hawaii 260, 270, 517 P.2d 26, 32 (1973) (Levinson, J., dissenting) (emphasis in original) (quoting from 2 Rev. Laws of Hawaii at 2123 (1925).
335. Id. at 271, 517 P.2d at 32-33.
336. Id. at 270, 517 P.2d at 32.
337. For a more complete discussion of case law prior to McBryde, see pages 176-94.

- 338. *McBryde Sugar Co. v. Robinson*, 55 Hawaii 260, 276, 517 P.2d 26, 35 (1973).
- 339. *Id.* at 277, 517 P.2d at 36 (quoting from Water Commission Report at 9).
- 340. *Id.* at 281, 517 P.2d at 38.
- 341. *Id.* at 283, 517 P.2d at 39.
- 342. *Id.* at 262, 517 P.2d at 27.
- 343. *Id.*
- 344. *Id.* at 302, 517 P.2d at 50.
- 345. See pages 156, 159, and 190 for a more complete description of the Enactment of Further Principles.
- 346. Hawaii Rev. Stat. sec. 7-1 (1977):

"The people shall also have a right to drinking water, and running water, and the right of way. The springs of water, and running water, and roads shall be free to all, on all lands granted in fee simple; provided, that this shall not be applicable to wells and watercourses, which individuals have made for their own use."
- 347. *McBryde Sugar Co. v. Robinson*, 54 Hawaii 174, 192, 504 P.2d 1330, 1342 (1973).
- 348. *Id.* at 197, 504 P.2d at 1344.
- 349. *Id.* at 198, 504 P.2d at 1344.
- 350. See Chief Justice Perry in *Territory v. Gay*, 31 Hawaii 376, 399-402 (1930) for a discussion of the policies against the riparian system in Hawaii (summarized at page 190 of this report).
- 351. *McBryde Sugar Co. v. Robinson*, *aff'd on rehearing*, 55 Hawaii 260, 291, 517 P.2d 26, 44 (1973) (Levinson, J., dissenting).
- 352. *Id.*
- 353. *Id.* at 285-286 n. 25, 517 P.2d at 40 n. 25. Justice Levinson turns his analysis from the riparian doctrine to ancient Hawaiian usage and judicial precedent by virtue of Hawaii Rev. Stat. sec. 1-1 (1976):

"The common law of England . . . is declared to be the common law of the State of Hawaii in all cases,

- except as otherwise expressly provided by . . . Hawaiian judicial precedent, or established by Hawaiian usage. . . ."
- 354. *McBryde Sugar Co. v. Robinson*, 54 Hawaii 174, 187-188, 504 P.2d 1330, 1339 (1973).
 - 355. *Id.* at 191, 504 P.2d at 1341.
 - 356. *Id.* at 198, 504 P.2d at 1344.
 - 357. *Id.*, *aff'd on rehearing*, 55 Hawaii 260, 292, 517 P.2d 26, 44 (1973) (Levinson, J., dissenting).
 - 358. See pages 146-53 for a more complete discussion of ancient Hawaiian use of water.
 - 359. *McBryde Sugar Co. v. Robinson*, *aff'd on rehearing*, 55 Hawaii 260, 293, 517 P.2d 26, 45 (1973) (Levinson, J., dissenting).
 - 360. 31 Hawaii 376 (1930); see pages 187-91 for a more complete description of Chief Justice Perry's opinion in *Territory v. Gay* (1930).
 - 361. 417 U.S. 962 (1974).
 - 362. *Robinson v. Ariyoshi*, 441 F.Supp. 559, 586 (D. Hawaii 1977).
 - 363. *Id.* at 564.
 - 364. *Id.*
 - 365. *Id.* at 566.
 - 366. *Id.* at 568.
 - 367. *Id.* at 583.
 - 368. *McBryde Sugar Co. v. Robinson*, 54 Hawaii 174, 189 n. 15, 504 P.2d 1330, 1340 n. 15 (1973).
 - 369. For further discussion of the issues discussed in this section, see Chang, Unravelling Robinson v. Ariyoshi: Can Courts "Take" Property? Hawaii B.J. _____ (1979) (forthcoming).
 - 370. 441 F. Supp. 559 (D. Hawaii 1977).
 - 371. 54 Hawaii 174, 504 P.2d 1330 (1973).
 - 372. 441 F. Supp. at 564. See 54 Hawaii 174, 201, 504 P.2d 1330, 1346 (Marumoto, J., dissenting) and 55 Hawaii 260, 262, 517 P.2d 26, 27 (Levinson, J., dissenting).

373. 441 F. Supp. at 584-85.

374. Id. at 586:

"Those portions of McBryde I and II holding that the State owns all surplus water and, under the aegis of the English common law doctrine of riparian rights, restraining the free diversion of surface waters for use outside the lands of the plaintiffs to which they are appurtenant, must be declared untenable and void."

375. Robinson v. Ariyoshi, 417 U.S. 962 (1974).

376. Robinson v. Ariyoshi, 441 F. Supp. 559 (D. Hawaii 1977).

377. See Territory v. Gay, 31 Hawaii 376 (1930), aff'd, 52 F.2d 356 (9th Cir. 1931), cert. denied, 284 U.S. 677 (1931).

378. 54 Hawaii 174, 200, 504 P.2d 1330, 1346 (1973).

379. Id.

380. See Currie, Res Judicata: The Neglected Defense, 41 U. Chi. L. Rev. 317, 341 (1978).

381. 441 F. Supp. at 587.

382. See Currie, supra note 380, at 341.

383. Id. at 333-34.

384. See generally, Stolz, Federal Review of State Court Decisions of Federal Questions: The Need for Additional Appellate Capacity, 64 Calif. L. Rev. 943, 946 (1976).

385. With one exception, see id. at 947, n. 22.

386. 28 U.S.C. sec. 1257 (1970).

387. 417 U.S. 962 (1974).

388. 263 U.S. 413 (1923).

389. Id. at 416.

390. Demorest v. City Bank, 321 U.S. 36, 42 (1944); Herb v. Pitcairn, 324 U.S. 117, 125 (1945):

"This Court from the time of its foundation has adhered to the principle that it will not review judgments of state courts that rest on adequate

and independent state grounds [citations omitted]. The reason is so obvious that it has rarely been thought to warrant statement. It is found in the partitioning of power between the state and federal judicial systems and in the limitations of our own jurisdiction. Our only power over state judgments is to correct them to the extent that they incorrectly adjudge federal rights.

391. Justice Stewart suggests unexpectedness or unpredictability may be a basis for jurisdiction:

"[A] state cannot be permitted to defeat the constitutional prohibition against taking property without due process of law by the simple device of asserting retroactively that the property it has taken never existed at all. Whether the decision here worked an unpredictable change in state law thus inevitably presents a federal question for the determination of this Court."

Hughes v. Washington, 389 U.S. 290, 296-297 (1967) (Stewart, J., concurring).

392. See generally, Stolz, supra note 384, at 944 nn. 5 and 6.

393. See Currie, supra note 380, at 323 n. 46.

394. Id. at 323 n. 49.

395. Id. at 324 n. 51. Petitioners in Robinson had the opportunity to retry the facts.

396. 28 U.S.C. sec. 1331 (1970) and 28 U.S.C. sec. 1343 (1970).

397. 389 U.S. 290, 294.

398. Id. at 295-96.

399. Id. at 296-97.

400. Id. at 296.

401. Id. at 298.

402. For a general discussion of the nature of appellate lawmaking in terms of "making" law as opposed to "finding" law, see Levy, Realist Jurisprudence and Prospective Overruling, 109 U. Pa. L. Rev. 1, 2 (1960).

403. Id. at 2-6.

404. *Great Northern Ry. v. Sunburst Oil and Refining Co.*, 287 U.S. 358 (1932).
405. Note, Prospective Operation of Decisions Holding Statutes Unconstitutional or Overruling Prior Decisions, 60 Harv. L. Rev. 437 (1947).
406. See Stimson, Retroactive Application of Law--A Problem in Constitutional Law, 38 Mich. L. Rev. 30, 47-54 (1939).
407. *Muhlker v. New York and Harlem R. R.*, 197 U.S. 544 (1905).
408. Id.
409. *Territory v. Gay*, 31 Hawaii 376 (1930); *Carter v. Territory*, 24 Hawaii 47 (1917); *Foster v. Waiahole Water Co.*, 25 Hawaii 726 (1921); *Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co.*, 15 Hawaii 675 (1904); *Palolo Land and Improvement Co. v. Wong Quai*, 15 Hawaii 554 (1903).
410. 441 F. Supp. at 585.
411. 159 U.S. 103 (1895).
412. Id. at 112 (1895).
413. See Stimson, supra note 406, at 50-51 (citing *Patterson v. Colorado ex rel Attorney General*, 205 U.S. 454, 460 (1907); and *Dunbar v. City of New York*, 251 U.S. 516 (1920)).
414. 281 U.S. 673 (1930).
415. Id. at 680:
". . . and that the mere fact that a state court had rendered an erroneous decision on a question of state law, or has overruled principles or doctrines established by previous decisions on which a party relied, does not give rise to a claim under the Fourteenth Amendment or otherwise confer appellate jurisdiction on this Court."
416. Id. at 681.
417. 166 U.S. 226 (1897).
418. The *Robinson* court cites *Brinkerhoff-Faris Co. v. Hill*, 281 U.S. 673 (1930), at 441 F. Supp. at 580.
419. See cases cited in footnote 413, supra.
420. 304 U.S. 64 (1938).

421. 1 Wall. (68 U.S.) 175 (1863); see Stimson, supra note 406, at 54 n. 108.
422. *Douglass v. Pike County*, 101 U.S. 677 (1880); *Anderson v. Santa Ana Township*, 116 U.S. 356 (1886). *German Savings Bank v. County of Franklin*, 128 U.S. 526 (1888); *Los Angeles v. Los Angeles City Water Co.*, 177 U.S. 558 (1900).
423. 41 U.S. 1 (1842).
424. "To litigate the same matter twice or more would impose costs on the parties and the burdened and subsidized judicial system. Indeed, if a judgment were not conclusive as to what it actually determined, 'the adjudicative process would fail to serve its social function of resolving disputes.'" F. James and G. Hazard, Civil Procedure 530 (2d ed. 1977).
425. 28 U.S.C. sec. 1738 (1970); see Currie, supra note 380.
426. See Currie, supra note 380, at 318 (citing *Huron Holding Corp. v. Lincoln Mine Operations Co.*, 312 U.S. 183 (1941), and *Davis v. Davis*, 305 U.S. 32 (1938)).
427. When the first action is brought in state court and the second in federal court, the federal court is compelled to apply *res judicata* if the substantive *res judicata* law of the state so requires. *Oklahoma Packing Co. v. Oklahoma Gas and Electric Co.*, 309 U.S. 4 (1939).
428. Currie, supra note 380, at 341.
429. 441 F. Supp. at 584 n. 35 (D. Hawaii 1977).
430. See generally, Currie, supra note 380.
431. See text at page 202.
432. Strict "mutuality" has been steadily losing ground. See *Blonder Tongue Laboratories v. University of Ill. Foundation*, 402 U.S. 313 (1971) and *Bernhard v. Bank of America Nat'l Trust and Savings Ass'n*, 19 Cal. 2d 807, 122 P.2d 892 (1942).
433. 42 U.S.C. sec. 1983 (1970):
"Every person who, under color of any statute, ordinance, regulation, custom, or usage, of any State or Territory, subjects or causes to be subjected, any citizen of the United States or any other person within the jurisdiction thereof to the deprivation of any rights, privileges, or immunities secured by the Constitution and laws, shall be liable to the party injured in an action

at law, suit in equity, or other proper proceeding for redress."

- 434. Preiser v. Rodriquez, 411 U.S. 475 (1973).
- 435. Ten circuits have applied res judicata to subsequent sec. 1983 actions (as cited in Currie, *supra* note 380, at 332 n. 106): *Mastracchio v. Ricci*, 498 F.2d 1257 (1st Cir. 1974), *cert. denied*, 420 U.S. 909 (1975); *Thistlewaite v. City of New York*, 497 F.2d 339 (2d Cir. 1974), *cert. denied*, 419 U.S. 1093 (1974); *Roy v. Jones*, 484 F.2d 86 (3rd Cir. 1973); *Davis v. Towe*, 526 F.2d 588 (4th Cir. 1975), *aff'g* 379 F. Supp. 536 (E. D. Va. 1974); *Brown v. Chastain*, 416 F.2d 1012 (5th Cir. 1969), *cert. denied*, 397 U.S. 951 (1970); *Coogan v. Cincinnati Bar Ass'n*, 431 F.2d 1209 (6th Cir. 1970); *Blanker v. City of Chicago*, 504 F.2d 1037 (7th Cir. 1974); *Norwood v. Parenteau*, 228 F.2d 148 (8th Cir. 1955), *cert. denied*, 351 U.S. 955 (1956); *Francisco Enterprises, Inc. v. Kirby*, 482 F.2d 481 (9th Cir. 1973), *cert. denied*, 415 U.S. 916 (1974); *Metros v. United States District Court*, 441 F.2d 313 (10th Cir. 1971).

Some commentators have argued that sec. 1983 should constitute an exception to res judicata. See Averitt, *Federal Section 1983 Actions After State Court Judgment*, 44 U. Colo. L. Rev. 191 (1972); McCormack, *Federalism and Sec. 1983: Limits on Judicial Enforcement of Constitutional Claims (Pt. II)*, 60 Va. L. Rev. 250 (1974); Comment, *Developments in the Law--Section 1983 and Federalism*, 90 Harv. L. Rev. 1133 (1977). But, for another view and an excellent analysis see Currie, *supra* note 380, at 327-332. See also, *Lombard v. Bd. of Education*, 502 F.2d 631 (2d Cir. 1974), *cert. denied*, 420 U.S. 976 (1975); *Ney v. California*, 439 F.2d 1285 (9th Cir. 1971) (alternative holding); *Brown v. Chastain*, 418 F.2d 1012 (5th Cir. 1969) (Rives, J., dissenting), *cert. denied*, 397 U.S. 951 (1970) and *Preiser v. Rodriquez*, 411 U.S. 475, 499 n. 14 (1973) (Brennan, J., dissenting).

- 436. 441 F. Supp. at 584 n. 35.
- 437. Civ. No. 75-0067 (D. Hawaii, filed Oct. 16, 1978).
- 438. 50 Hawaii 314, 440 P.2d 76 (1968).
- 439. 55 Hawaii 677 (1973).
- 440. 419 U.S. 872 (1974).
- 441. *Sotomura v. County of Hawaii*, Civ. No. 75-0067, slip opinion at 18 (D. Hawaii, filed Oct. 16, 1978).
- 442. 389 U.S. 290, 294 (1967), discussed at pages 204-05.
- 443. *Brinkerhoff-Faris Trust Co. v. Hill*, 281 U.S. 673 (1930).

- 444. *Id.*
- 445. See page 202.
- 446. See pages 208-10.
- 447. See, Motion For Leave to File Brief Amicus Curiae of Hawaiian Sugar Planters' Association and Brief, *McBryde v. Robinson*, U.S. Supreme Court, Nos. 73-1440, 73-1441 and 73-1442 (March 1974).
- 448. *McBryde Sugar Co. v. Robinson*, 54 Hawaii 174, 191, 198, 200, 504 P.2d 1330, 1341, 1344, 1345 (1973).
- 449. *Id.* at 199, 504 P.2d at 1345; see also *id.* at 198, 504 P.2d at 1344.
- 450. *Id.* at 185-87, 191-97, 504 P.2d at 1338-39, 1341-44.
- 451. *Id.* at 189 n. 15, 504 P.2d at 1340 n. 15.
- 452. See Casad, *Res Judicata* 8 (1976):

"Declarations of law or of the meaning of laws made by the court have no binding force as precedent for later cases unless the declaration was made in resolving a question of law that was necessary to the decision of the case before the court. Only such declarations are 'holdings' having stare decisis effect. Other statements of law contained in the court's opinion are dicta which may or may not be followed in later cases."
- 453. *McBryde Sugar Co. v. Robinson*, 54 Hawaii, 174, 185-90, 197-98, 504 P.2d 1330, 1338-40, 1344 (1973).
- 454. See Trelease, *Government Ownership and Trusteeship of Water*, 45 Calif. L. Rev. 638 (1957); and see the discussion on pages 219-20 of this report.
- 455. *Id.* at 641 nn. 11-12; Ariz. Comp. Laws 1864-1871, art. 22; Colo. Const. art. XVI, sec. 5.
- 456. See, *e.g.*, *Willey v. Decker*, 11 Wyo. 496, 73 P. 210 (1903).
- 457. Trelease, *supra* note 454, at 640.
- 458. See the discussion on pages 219-20.
- 459. See generally, Trelease, *supra* note 454.
- 460. *McBryde v. Robinson*, 54 Hawaii at 186, 504 P.2d at 1338 (1973):

"We believe that the right to water is one of the most important usufructs of lands, and it appears clear to us that by the foregoing limitation the right of water was specifically and definitely reserved for the people of Hawaii for their common good in all of the land grants."

461. See pages 230-37 and pages 242-48.

462. See e.g., *Territory v. Gay*, 31 Hawaii 376 (1930), *aff'd*, 52 F.2d 356 (9th Cir. 1931), *cert. denied*, 284 U.S. 677 (1931).

463. Wyo. Const. art. 8, sec. 1.

464. *Id.* art. 8, sec. 3.

465. *Willey v. Decker*, 11 Wyo. 496, 73 P. 210 (1903).

466. *Merril v. Bishop*, 74 Wyo. 298, 287 P.2d 620, 625 (1955).

467. "All surface, underground, flood and atmospheric waters within the boundaries of the state are the property of the state for the use of its people and are subject to appropriation for beneficial uses as provided by law." Mont. Const. art. IX, sec. 3, cl. 3.

"The water of the ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state is the property of the state." Tex. Water Code Ann. tit. 2, sec. 11.021, cl. a (Vernon Supp. 1978).

468. The corpus of water in natural streams is publici juris - the property of the public. *Mettler v. Ames Realty Co.*, 61 Mont. 152, 201 P. 702, 704 (1921).

The state owns in trust for the people the waters of all natural streams. *Goldsmith and Powell v. State*, 159 S.W.2d 534, 535 (Tex. Civ. App. 1942).

469. "The waters of all sources, flowing in streams, canyons, ravines or other natural channels, or in definite underground channels, whether perennial or intermittent, flood, waste or surplus water, and of lakes, ponds and springs on the surface, belong to the public and are subject to appropriation and beneficial use as provided in this chapter." Ariz. Rev. Stat. sec. 45-101, cl. A (1956).

"The water of every natural stream, not heretofore appropriated, within the state of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided." Colo. Const. art. XVI, sec. 5.

"The water of all sources of water supply within the boundaries of the state whether above or beneath the surface of the ground, belongs to the public." Nev. Rev. Stat. sec. 533.025 (1973).

"All natural waters flowing in streams and watercourses, whether such be perennial, or torrential, within the limits of the state of New Mexico, belong to the public and are subject to appropriation for beneficial use." N.M. Stat. Ann. sec. 75-1-1 (1953).

470. "The legislature shall provide for the utilization, development and conservation of all natural resources belonging to the State, including land and waters, for the maximum benefit of its people Wherever occurring in their natural state, fish, wildlife, and waters are reserved to the people for common use." Alaska Const. art. VIII, secs. 2, 3.

471. Cal. Const. art. X, sec. 5.

472. *Jensen, Some Legal Aspects of Water Resources Management*, 37 Public Admin. Rev. 456, 458 (1977). For a discussion of how the riparian doctrine has been used in Hawaii, see pages 281-85 and 297-98.

473. R. L. Dewsnup and D. W. Jensen, *A Summary-Digest of State Water Laws* 35 (1973).

474. J. L. Sax, *Water Law, Planning & Policy* 1 (1968).

475. *Id.*

476. 2 W. Hutchins, *Water Rights Laws in the Nineteen Western States* 91 (1977).

477. *Gould v. Stafford*, 77 Cal. 66, 18 P. 879 (1888). Consistent with this view, that riparian rights are vested exclusively in the riparian owner and "extend only to the use of the water upon the abutting land and none other," the California Supreme Court in a 1922 case held that a city, the boundaries of which extended to a stream, had no right to apply the water to public use within the city. *Antioch v. Williams Irr. Dist.*, 188 Cal. 451, 457, 205 P. 688, 691 (1922).

478. A riparian proprietor had contracted with an oil company to supply water to its drilling sites and later repudiated the contract on the basis that water diversion to non-riparian lands was illegal. The court held that, because no possible damage to other riparian owners could result, the contract was not for an illegal purpose and was valid. *Texas Co. v. Burkett*, 177 Tex. 16, 296 S.W. 273 (1927).

479. A riparian owner of land abutting a tributary of California's Santa Ana River was diverting water from the main Santa Ana River and transporting it across a high natural bluff to irrigate the lands abutting the tributary. The bluff formed separate drainage basins

for the tributary and the river. The riparian owner unsuccessfully argued that the entire Santa Ana River system was one watershed for the purpose of determining riparian rights. The court held that where two streams unite, each is considered as a separate stream and that land lying within the watershed of one stream above the point of confluence is not considered to be within the watershed of the main stream when hills and bluffs form separate watersheds. "Land which is not within the watershed of the river is not riparian thereto, and is not entitled, as riparian land, to the use or benefit of the water from the river, although it may be part of an entire tract which does extend to the river." Anaheim Union Water Co. v. Fuller, 150 Cal. 327, 88 P. 978, 980 (1907) (citing in support of the decision Chauvet v. Hill, 93 Cal. 410, 28 P. 1066 (1892) and Watkins L. Co. v. Clements, 98 Tex. 578, 86 S.W. 733 (1905)).

480. Id.

481. Dewsnap and Jensen, supra note 473, at 17-19.

482. Id. at 19.

483. Florida Water Resources Act of 1972, Fla. Stat. Ann. sec. 373.236 (West 1974):

"Duration of permits

"(1) Permits may be granted for any period of time not exceeding twenty years. The governing board or the department may base duration of permits on a reasonable system of classification according to source of supply or type of use, or both.

"(2) The governing board or the department may authorize a permit of duration of up to fifty years in the case of a municipality or other governmental body or of a public works or public service corporation where such a period is required to provide for the retirement of bonds for the construction of waterworks and waste disposal facilities."

484. Id. sec. 373.243:

"Revocation of permits

"After a hearing under Sec. 373.126, the governing board or the department may revoke a permit as follows:

"(1) For any material false statement in an application to continue, initiate, or modify a use, or for any material false statement in any report or statement of fact required of the user pursuant to the provisions of this chapter, the governing board or the department may revoke the user's permit, in whole or in part, permanently.

"(2) For willful violation of the conditions of the permit, the governing board or the department may permanently or temporarily revoke the permit, in whole or in part.

"(3) For violation of any provision of this chapter, the governing board or the department may revoke the permit, in whole or in part, for a period not to exceed one year.

"(4) For nonuse of the water supply allowed by the permit for a period of two years or more, the governing board or the department may revoke the permit permanently and in whole unless the user can prove that his nonuse was due to extreme hardship caused by factors beyond his control.

"(5) The governing board or the department may revoke a permit, permanently and in whole, with the written consent of the permittee."

485. Id. sec. 373.246:

"Declaration of water shortage or emergency

"(1) The governing board or the department by regulation shall formulate a plan for implementation during periods of water shortage. As a part of this plan the governing board or the department shall adopt a reasonable system of permit classification according to source of water supply, method of extraction or diversion, use of water, or a combination thereof.

"(2) The governing board or the department by order may declare that a water shortage exists within all or part of the district when insufficient water is available to meet the requirements of the permit system or when conditions are such as to require temporary reduction in total use within the area to protect water resources from serious harm. Such orders shall become final and

be reviewable in the same way as orders under Sec. 373.126.

- "(3) In accordance with the plan adopted under subsection (1), the governing board or the department may impose such restrictions on one or more classes of permits as may be necessary to protect the water resources of the area from serious harm and to restore them to their previous condition.
- "(4) A declaration of water shortage and any measures adopted pursuant thereto may be rescinded by the governing board or the department.
- "(5) When a water shortage is declared, the governing board or the department shall cause notice thereof to be published in a prominent place within a newspaper of general circulation throughout the area. Such notice shall be published each day for the first week of the shortage and once a week thereafter until the declaration is rescinded. Publication of such notice shall serve as notice to all users in the area of the condition of water shortage.
- "(6) The governing board or the department shall notify each permittee in the district by regular mail of any change in the condition of his permit or any suspension of his permit or of any other restriction on his use of water for the duration of the water shortage.
- "(7) If an emergency condition exists due to a water shortage within any area of the district, and if the department, or the executive director with the concurrence of the governing board, finds that the exercise of powers under subsection (1) are not sufficient to protect the public health, safety, or welfare, the health of animals, fish or aquatic life, a public water supply, or recreational, commercial, industrial, agricultural, or other reasonable uses, it or he may, pursuant to the provisions of Sec. 373.119, issue orders reciting the existence of such an emergency and requiring that such action, including but not limited to apportioning, rotating, limiting, or prohibiting the use of the water resources of the district, be taken as the department or the executive director deems necessary to meet the emergency.

"(8) An affected party to whom an emergency order is directed under subsection (7) shall comply immediately, but may challenge such an order in the manner set forth in Sec. 373.119."

486. N.J. Stat. Ann. sec. 58:1-39 (West 1966):

". . . It shall be determined whether the application is justified in the public interest, whether it provides for proper and safe construction of all works connected therewith, whether it provides for proper protection of the supply of the watershed from contamination, whether the reduction of the dry-season flow of any stream will be caused to an amount likely to produce unsanitary conditions or otherwise unduly injure public or private interests, and whether the plans are just and equitable to all persons concerned, particular consideration being given to the present and future necessity for sources of water supply. A permit may be made upon such conditions or terms as the council may deem necessary in the public interest. . . ."

487. Id. sec. 58:1-44:

"Limitation on duration of permits; review prior to renewal; modification

"All permits except those issued under the provisions of section 4 hereof [referring to subsurface and percolating waters] shall be limited to a definite period of time to be determined by the council, which shall be long enough to provide for amortization, at a reasonable rate, of capital investment in structures and facilities necessary to divert and utilize the water required, but not longer than 25 years, and shall further provide for adequate review prior to renewal, and for modification if required in the public interest."

488. Id. sec. 58:1-41:

"Transfer of permits

"Permits may not be transferred except by the council for identical use on the same lands or after due consideration of the use to be made of the water by the transferee."

489. Id. sec. 58:1-46:

"Permit fee; annual charge for water diverted

"All diverters of surface waters in watershed areas delineated under section 2 hereof shall pay to the State of New Jersey, through the division, for each diversion permit a fee of \$10.00 upon the granting thereof. All such diverters for consumptive use shall also pay an annual charge, at the rate of \$0.50 per million gallons, for all water so diverted under said permit in excess of the first 100,000 gallons diverted on any day, beginning with the date of delineation. All such diverters for nonconsumptive use shall pay an annual charge at the rate of \$10.00 per million gallons, based on the average daily amount of water diverted over and above 100,000 gallons beginning with the date of delineation or such subsequent date as the diversion may begin."

490. 3 Hutchins, Water Rights Laws, supra note 476, at 521.

491. Dewsnap and Jensen, supra note 473, at 35.

492. Note, The Texas Water Rights Commission: Allocating a Limited Natural Resource for Competing Uses, 47 Texas Law Review 864, 874-75 (1969).

493. Dewsnap and Jensen, supra note 473, at 5.

494. Id. at 32.

495. Colo. Const. art. XVI, sec. 6; Colo. Rev. Stat. sec. 37-92-301(3) (1973).

496. See, e.g., N.M. Stat. Ann. secs. 75-5-1 to 75-5-37 (1953).

497. Colo. Rev. Stat. Ann. secs. 37-92-201 through 37-92-204 and 37-92-301 through 37-92-304 (Supp. 1976).

498. Other "dual system" states include (a) Oklahoma, which has a system of water rights law similar to that used in Texas (see Dewsnap and Jensen, supra note 473, at 603-610 and Hudson, Property: Riparian and Appropriation Rights to Foreign Water in Oklahoma, 19 Okla. L. Rev. 462, 463 (1966), and (b) Oregon, which primarily relies on the appropriation system but still has vestiges of the riparian doctrine (see Dewsnap and Jensen, supra note 473, at 609-629, and 3 Hutchins, Water Rights Law, supra note 476, at 459-466).

499. Watkins Land Co. v. Clements, 98 Tex. 578, 86 S.W. 733 (1905).

500. Holmes v. Nay, 186 Cal. 231, 236-37, 199 P. 325 (1921).

501. Anaheim Union Water Co. v. Fuller, 150 Cal. 327, 331, 88 P. 978 (1907).

502. Spring Valley Water Co. v. Alameda County, 88 Cal. App. 157, 164, 263 P. 318 (1927).

503. See the constitutional and statutory provisions quoted in note 518, infra.

504. Meridian, Ltd. v. San Francisco, 13 Cal. 2d 424, 445, 90 P.2d 537, 91 P.2d 105 (1939).

505. Dewsnap and Jensen, supra note 473, at 143.

506. Id. at 700-701.

507. 3 Hutchins, Water Rights Laws, supra note 476, at 506 (citing 1889 Tex. Laws, ch. 88).

508. Tex. Water Code Ann. tit. 2, sec. 11-303 (Vernon Supp. 1978).

509. Herminghaus v. Southern California Edison Co., 200 Cal. 81, 252 P. 607 (1926).

510. Cal. Const. art. XIV, sec. 3. See pages 235-36 for further details on this change.

511. Dewsnap and Jensen, supra note 473, at 700.

512. 3 Hutchins, Water Rights Laws, supra note 476, at 503.

513. Kolodey, Water Rights--Spanish Land Grants - Appurtenant Irrigation Rights, 17 Southwestern L. J. 193, 194 (1963).

514. Texas v. Valmont Plantations, 346 S.W.2d 853 (Tex. Civ. App. 1961), aff'd on appeal, 163 Tex. 381, 355 S.W.2d 502 (1962).

515. State v. Hidalgo County Water Control and Imp. District, 443 S.W.2d 728 (Tex. Civ. App. 1969).

516. Haney v. Neace-Stark Co., 109 Ore. 93, 216 P. 757 (1923). The court held that a company can capture appropriated water in storage dams and pump it for irrigation to other lands if such use does not interfere with vested rights of others to water use during the irrigation season.

517. Dewsnap and Jensen, supra note 473, at 37. See, for example, N.J. Stat. Ann. 58:1-41 (West 1966), quoted in note 488, supra.

518. "State waters may be appropriated for any beneficial use." Tex. Water Code Ann. sec. 11.023 (Vernon Supp. 1978).

"Beneficial use shall be the basis, the measure and the limit of the right to the use of water." Nev. Rev. Stat. sec. 533.035 (1973).

"It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use. . . ." Cal. Const. art. X, sec. 2.

See also the statutes quoted in notes 467, 469, 470, supra.

519. "Riparian rights in a stream or water course attach to, but to no more than so much of the flow thereof as may be required or used consistently with this section, for the purposes for which such lands are, or may be made adaptable, in view of such reasonable and beneficial uses; . . ." Cal. Const. art. XIV, sec. 3 (constitutionally upheld in *Peabody v. Vallejo*, 2 Cal. 2d 351, 40 P.2d 486 (1935)).
520. Tex. Water Code Ann. tit. 2, sec. 11-303 (Vernon Supp. 1978).
521. Wyo. Const. art. VIII, sec. 3; Colo. Const. art. XVII, secs. 5, 6.
522. Cal. Water Code sec. 275 (West Supp. 1977) provides that the state may bring an action to enjoin waste in water use, as does Tex. Water Code Ann. tit. 2, secs. 11.092, 11.093 (Vernon Supp. 1978). Section 11.095 of the Texas code cited provides that water waste is a misdemeanor punishable by fine and imprisonment.
523. *Worden v. Alexander*, 108 Mont. 208, 90 P.2d 160, 163 (1939) (the water supply in an irrigation ditch was insufficient to satisfy the irrigation requirements of two appropriators; the court ignored claims of priority and apportioned the water to maximize the combined output of high-value crops from the farms).
524. *Waterford Irrigation Dist. v. Turlock Irrigation Dist.*, 50 Cal. App. 213, 194 P. 757, 761 (1926). The court held that one joint owner of an irrigation dam could require the other owner to reconstruct its dam gates to maximize the outflow to the customers of the districts.

The Alaska Supreme Court also recognized the maximum use policy in interpreting certain provisions of the Alaska Water Use Act of 1966. "[T]he provisions of [this article] were intended to encourage the broadest possible access to and use of state waters by the general public." *Wernberg v. State*, 516 P.2d 1191, 1198 (Alaska 1974).

525. Colo. Const. art. XVI, sec. 6.
526. Idaho Const. art. XV, sec. 3.

527. Ariz. Rev. Stat. Ann. sec. 45-147, c1. B (West Supp. 1977).
528. Tex. Water Codes Ann. tit. 2, sec. 11.024 (Vernon Supp. 1978).
529. *Tolle v. Corith*, 31 Tex. 362, 98 Am. Dec. 540 (1868). The court rejected an application for an appropriation of water for power purposes in favor of subsequently filed applications to store water for domestic and irrigation purposes.
530. *Peck v. Sharrow*, 96 Idaho 512, 531 P.2d 1157 (1975). Although the state constitution assigns preference to domestic use, the court held that a homeowner could not divert the water from a creek to his home, thereby decreasing the volume available to a downstream prior appropriator (who was using most of his awarded water for irrigation) without either installing a meter to assure the required flow downstream or compensating the prior appropriator for damages. The only case cited in support of the decision was an earlier Idaho Supreme Court case with virtually identical facts. In that case the court stated: "It is clear that under the Constitution, those using water for domestic purposes have the preference over those claiming for any other purpose; but the usage for such superior purpose is subject to provisions regulating the taking of private property." *Bassinger v. Taylor*, 30 Idaho 289, 164 P. 522, 523 (1917). In this earlier case, the court did not enjoin the domestic user from taking water but warned that proven damage to the other party would be compensable.
531. Wyo. Stat. sec. 41-3-102 (1977).
532. Alaska Stat. sec. 46.15.080 (1977).
533. *Hufford v. Dye*, 162 Cal. 147, 121 P. 400 (1912). The court held that an appropriation right is not measured by the extent of the appropriation specifications or by the volume actually diverted from a stream but by the extent to which the appropriator applies the water to beneficial purposes; and where stream water is insufficient to permit a diversion and simultaneous use, the court may fix times when, by rotation, the whole may be used by each party.
534. Ariz. Rev. Stat. sec. 45-245, c1. B (1956); Wyo. Stat. sec. 41-3-612 (1977); Nev. Rev. Stat. sec. 533-075 (1973).
535. *Nash v. Clark*, 27 Utah 158, 75 P. 371 (1904), aff'd, 198 U.S. 361 (1905). See also *White v. Marty*, 97 Idaho 85, 540 P.2d 270 (1975) in which, under identical circumstances (an action to condemn a right of way across lands of another for an irrigation ditch) the Idaho Supreme Court also upheld the constitutionality of such a procedure.
536. *Clark v. Nash*, 198 U.S. 361 (1905). The Court held that because Utah is an unusually dry state, a statute permitting condemnation

of a right of way across the lands of another for irrigation, although not a public use within the normal purview of the Constitution of the United States, is within the legislative power of the state by virtue of the special local circumstances. The Court thus upheld the state statute's validity.

This case has been cited in many state and federal court cases and the decision has not been overruled or criticized. One recent federal court case in which the Clark decision was followed as authority is *Schneider v. District of Columbia*, 117 F. Supp. 705 (D.D.C. 1953). In this case, the court upheld a local statute that enabled condemnations for a slum clearance and beautification project against claims by the realty owners that no public purpose was served.

- 537. Ariz. Const. art. II, sec. 17.
- 538. *Cienega Cattle Co. v. Atkins*, 59 Ariz. 287, 126 P.2d 481 (1942). A cattleman sought to condemn a right of way across the land of the complainant to permit his cattle to pass from his homestead to a National Forest where he held grazing permits. The court granted the condemnation because such a right of way was necessary for full utilization of valuable and scarce grazing land. This decision has not been challenged in the federal courts.
- 539. Cal. Const. art. 1, sec. 19; Cal. Water Code sec. 1007 (West 1971).
- 540. Cal. Const. art. 1, sec. 19; for a leading case applying this provision to riparian owners, see footnote 542, *infra*.
- 541. *Turlock Irrigation Dist. v. Williams*, 76 Cal. 360, 18 P. 379 (1888).
- 542. *United States v. Gerlach Live Stock Co.*, 339 U.S. 725 (1950), *aff'g*, 76 F. Supp. 87 (Ct. Cl. 1948). The United States Government, manager of the California Central Valley project, contested an award of damages made by the Court of Claims to the riparian owners for the loss of their grasslands. The Government contended that the 1928 California Constitutional Amendment restricted riparian use of waters to reasonable and beneficial uses and that periodic inundation of "uncontrolled grasslands" was wasteful and not within the definition of reasonable and beneficial.

The United States Supreme Court interpreted the 1928 California amendment as seeking not to destroy existing rights but to place reasonable limits on all uses of water, however the right came into existence. The Court found that the grasses destroyed were a beneficial commodity and that the riparian owners had done nothing wasteful in taking advantage of the floodwaters. Accordingly, the Court held that the California legislature had not destroyed existing rights, that loss of vested riparian rights was compensable under California law, and that the Court of Claims had properly awarded damages.

- 543. *Chowchilla Farms, Inc. v. Martin*, 219 Cal. 1, 25 P.2d 435 (1933).
- 544. *Chow v. City of Santa Barbara*, 236 Cal. 159, 22 P.2d 5 (1933).
- 545. *People v. Elk River Mill and Lumber Co.*, 107 Cal. 221, 40 P. 531 (1895).
- 546. *W. S. Ranch v. Kaiser Steel Corp.*, 388 F.2d 257 (10th Cir. 1967).
- 547. *Id.*, 391 U.S. 593 (1968).
- 548. *Sherrill v. U.S.*, 381 F.2d 744 (Ct. Cl. 1967).
- 549. *Baumann v. Smrha*, 145 F. Supp. 617 (D. Kan. 1956), *aff'd per curium*, 352 U.S. 863 (1956).
- 550. *Williams v. City of Wichita, Kansas*, 279 F.2d 375, 377-78 (10th Cir. 1960).
- 551. *Renninger v. State*, 70 Idaho 170, 213 P.2d 911 (1950).
- 552. *Suffield v. State ex rel Morrisson*, 92 Ariz. 152, 375 P.2d 263 (1962).
- 553. *Norman v. Kusel*, 96 Neb. 400, 150 N.W. 201 (1914).
- 554. *North Sterling Irrigation Dist. v. Dickman*, 59 Colo. 169, 149 P. 97 (1915).
- 555. *Lowe v. Yolo County Consol. Water Co.*, 157 Cal. 503, 108 P. 297 (1910).
- 556. *Katz v. Walkinshaw*, 141 Cal. 116, 70 P. 663 (1902).
- 557. *City Mill Co. v. Honolulu Sewer & Water Comm'n*, 30 Hawaii 912, 927 (1929). See the discussion of this case at pages 191-94.
- 558. *Katz v. Walkinshaw*, 141 Cal. at 116, 74 P. at 766.
- 559. Cal. Const. art. X, sec. 2.
- 560. See, *e.g.*, *Lux v. Haggin*, 69 Cal. 255, 4 P. 919 (1884).
- 561. *Peabody v. Vallejo*, 2 Cal. 2d 351, 40 P.2d 486 (1935).
- 562. *United States v. Gerlach Live Stock Co.*, 339 U.S. 725 (1950) (see note 542, *supra*).
- 563. *Joslin v. Marin Mun. Water Dist.*, 67 Cal. 2d 132, 429 P.2d 889 (1967).

564. Alaska Laws 1966, ch. 50, Alaska Stat. sec. 46.15.010 et. seq. (1977).
565. See generally 3 Hutchins, Water Rights Laws, supra note 476, at 150-55 and Dewsnap and Jensen, supra note 473, at 95.
566. Alaska Stat. sec. 46.15.060 (Supp. 1977): "A water right acquired by law before July 1, 1966 or a beneficial use of water on July 1, 1966, or made within five years before July 1, 1966, or made in conjunction with works under construction on July 1, 1966, under a lawful common law or customary appropriation or use, is a lawful appropriation under this chapter. The appropriator is subject to applicable provisions of this chapter and rules and regulations adopted under this chapter."
567. G & A Contractors, Inc. v. Alaska Greenhouses, Inc., 517 P.2d 1379 (Alaska 1974) (holding that beneficial use encompasses plans to enhance the attractiveness of the streambanks to create a showplace in connection with a nursery business); Wernberg v. State, 516 P.2d 1191 (Alaska 1973) (holding that stream access to a tidal inlet employed for commercial fishing purposes is a beneficial use).
568. Tex. Water Code Ann. tit. 2, sec. 11-303 (Vernon Supp. 1978).
569. Id.
570. Texas Water Rights Comm'n v. Wright, 464 S.W.2d 642 (Texas 1971). This case involved a constitutional challenge to Tex. Rev. Civ. Stat. art. 7519a, which authorized cancellation of water permits upon proof of nonuse for ten consecutive years. In 1928, the complainants were issued permits to direct irrigation water from the Rio Grande River. The permits were used until 1954 when a flood washed out the pumps and diversion facilities. The pumps and facilities were never replaced and no water was subsequently used under these permits.
- The effective date of the statute was August 21, 1957. The complainants' permits were cancelled in 1967. The Texas Supreme Court reasoned that because beneficial use is the basis, measure and limit of the right to use water in Texas, nonuse confers no right. The court held that due process was observed because the complainants were given notice when the law was passed and were given ten years to correct their position. This decision was not challenged in federal court.
571. Okla. Stat. Ann. tit. 60, sec. 60 (West 1971).
572. Okla. Stat. Ann. tit. 82, secs. 105.1-105.2 (West Supp. 1977-78).
573. Kan. Stat. Ann. secs. 82a-701 to 82a-717a (1977); see text at pages 232-33, and see Ausness, Water Use Permits in a Riparian State: Problems and Proposals, 66 Ky. L. J. 191, 247-50 (1977).

574. Ausness, supra note 573, at 245 (citing Eakin, Adjudication Provisions Under the 1909 Code, 50 Ore. L. Rev. 664, 669-71 (1971)).
575. Id. at 245-47 (citing In re Willow Creek, 144 P. 505 (Ore. 1914); In re Hood River, 227 P. 1065 (Ore. 1924); California - Oregon Power Co. v. Beaver Portland Cement Co., 73 F.2d 555 (9th Cir. 1934), aff'd, 295 U.S. 142 (1935)).
576. See, e.g., Lobdell v. Simpson, 2 Nev. 274, 90 Am. Dec. 537 (1866); Vansickle v. Haines, 7 Nev. 249 (1872); Jones v. Adams, 19 Nev. 78, 6 P. 442 (1885).
577. See generally, Ausness, supra note 573, at 250-56.
578. Gould v. Maricopa Canal Co., 8 Ariz. 429, 76 P. 598 (1904); Utt v. Frey, 106 Cal. 392, 39 P. 807 (1895); Thomas v. Ball, 66 Mont. 161, 213 P. 597 (1923); Schulz v. Sweeny, 19 Nev. 359, 11 P. 253 (1886); State ex rel Reynolds v. South Springs Co., 80 N.M. 144, 452 P.2d 478 (1969); Laramie Rivers Co. v. Le Vasseur, 65 Wyo. 414, 202 P.2d 680 (1949); City of Anson v. Arnett, 250 S.W.2d 450 (Tex. Civ. App. 1952).
579. Alaska Stat. sec. 46.15.140 (1977); Colo. Rev. Stat. Ann. sec. 37-92-103 (1973) provides that the water engineer shall treat nonuse for ten years as a rebuttable presumption of abandonment.
580. Davis v. Gail, 32 Cal. 27 (1867).
581. San Luis Valley Irrigation Dist. v. Alamosa, 55 Colo. 386, 135 P. 769 (1913).
582. "When the owner of a right to the use of water ceases or fails to use the water appropriated for five successive years, the right to the use shall cease, and the water shall revert to the public and shall again be subject to appropriation." Ariz. Rev. Stat. Ann. sec. 45-101, c1. c (1956). Similarly worded provisions in other state statutes are as follows: Alaska Stat. sec. 46.15.140, c1. a (1977); Cal. Water Code Ann. sec. 1241 (West 1971); Nev. Rev. Stat. sec. 533.060, c1. 2 (1973); N.M. Stat. Ann. sec. 75-5-26 (1953); Wyo. Stat. sec. 41-3-401, c1. a (1977).
583. Cal. Water Code secs. 1240, 1241 (West 1971).
584. Tex. Water Code Ann. tit. 2, sec. 11.173 (Vernon Supp. 1978).
585. Alaska Stat. sec. 46.15.040 (1977).
586. Colo. Rev. Stat. sec. 38-41-101 (1973); Mont. Rev. Codes Ann. sec. 93-2504 (Supp. 1977).
587. Egan v. Estrada, 6 Ariz. 248, 56 P. 721 (1899); Pasadena v. Alhambra, 33 Cal. 2d 908, 207 P.2d 17 (1949); Martin v. Burr, 111 Tex. 57, 228 S.W. 543 (1921).

588. Alaska Stat. sec. 09.25.050 (1973) (statutory period is seven years); Ariz. Rev. Stat. Ann. secs. 12-522 through 12-526 (1956) (statutory period is five years); Cal. Civ. Proc. Code sec. 1007 (West 1954) (five years); Colo. Rev. Stat. sec. 38-41-101 (1973) (eighteen years); Mont. Rev. Codes Ann. secs. 93-2504 through 93-2513 (Supp. 1977) (five years); Nev. Rev. Stat. sec. 11.080 (1973) (five years); N.M. Stat. Ann. sec. 23-1-22 (Supp. 1975) (ten years); Wyo. Stat. sec. 1-3-103 (1977) (ten years); Tex. Rev. Civ. Stat. Ann. tit. 91, secs. 5507, 5509, 5510, 5512 (Vernon 1958) (five years). Note: The statutory periods cited above are for general circumstances. Special circumstances (such as having "color of title" or large acreages) will modify these periods.
589. Dalton v. Rentaria, 2 Ariz. 275, 15 P. 37 (1887).
590. Wedgeworth v. Wedgeworth, 20 Ariz. 518, 181 P. 952 (1919).
591. Halford Ditch Co. v. Independent Ditch Co., 22 N.M. 169, 159 P. 860 (1916).
592. Tanner v. Provo Res. Co., 76 Utah 335, 289 P. 151, 159 (1930).
593. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 504 P.2d 1330 (1973).
594. Id., 55 Hawaii 260, 303, 517 P.2d 27, 50 (1973) (Levinson, J., dissenting).
595. Robinson v. Ariyoshi, 441 F. Supp. 559, 585-86 (D. Hawaii 1977).
596. Selinger, Van Dyke, Amano, Takenaka, and Young, Selected Legal Issues Related to Growth Management in Hawaii, in Growth Management Issues in Hawaii 171-76 (Hawaii Institute for Management and Analysis in Government, 1977); reprinted sub nom Selected Constitutional Issues Related to Growth Management in the State of Hawaii, 5 Hastings Con. L. Q. 639, 695-702 (1978).
597. Nos. 76-2400 and 76-1968 (9th Cir., Aug. 11, 1978).
598. United States v. Kaiser Aetna, 408 F. Supp. 42, 52 (D. Hawaii 1976).
599. Id.; emphasis in original.
600. United States v. Kaiser Aetna, Nos. 76-2400 and 76-1968 (9th Cir., Aug. 11, 1978), slip opinion at 10.
601. 52 Hawaii 653, 485 P.2d 1048 (1971).
602. Id. at 658-59, 485 P.2d at 1051, citing Cos Corporation v. City of Evanston, 27 Ill. 2d 570, 190 N.E.2d 364 (1963), discussed below at note 605.

603. Id. at 659, 485 P.2d at 1051, citing Bregar v. Britton, 75 So. 2d 753 (Fla. 1954), discussed below at note 606.
604. Id.
605. Cos Corporation v. City of Evanston, 27 Ill. 2d 570, 190 N.E.2d 364 (1963).
606. Bregar v. Britton, 75 So. 2d 753 (Fla. 1954).
607. Russian Hill Improvement Ass'n v. Bd. of Permit Appeals, 66 Cal. 2d 34, 423 P.2d 824 (1967).
608. Allen v. City and County of Honolulu, _____ Hawaii _____, 571 P.2d 328 (1977).
609. Denning v. County of Maui, 52 Hawaii 653, 485 P.2d 1048 (1971).
610. McBryde Sugar Co. v. Robinson, 55 Hawaii 260, 283, 517 P.2d 26, 39 (1973) (Levinson, J., dissenting).
611. Id. at 281, 517 P.2d at 38; see also Robinson v. Ariyoshi, 441 F. Supp. 559, 576, 582 (D. Hawaii 1977).
612. State v. Zimring, 58 Hawaii 106, 566 P.2d 725 (1977). The state sued to quiet title to approximately eight acres of land formed when volcanic eruption extended the shoreline. The court held that "the combination of the collection of taxes on, and silence with respect to a claim for the subject land does not estop the State" from asserting ownership to the land. (Id. at 128, 566 P.2d at 738).
613. Illinois Central Railroad Co. v. Illinois, 146 U.S. 387 (1892). The 1869 Illinois legislature had granted over 1,000 acres underlying Lake Michigan, constituting the commercial waterfront of Chicago, to the railroad. The 1873 legislature repealed the grant and brought action to have it annulled. The court held for the state and declared that submerged lands are held in trust for the enjoyment of commerce, fishing, and navigation rights by citizens of the state.
- King v. Oahu Railway and Land Co., 11 Hawaii 717 (1899). The company alleged that a certificate of approval by the cabinet concerning the location of the company's terminal land carried with it the right to condemn land under Honolulu harbor for its own purposes. Basing its decision on Illinois Central, the Hawaii Court held that the cabinet could not have conveyed these rights because "lands under the navigable waters in and around the territory of the Hawaiian Government are held in trust for the public uses of navigation" (at 725).
614. See the analysis of McBryde on pages 294-99.

615. See text at pages 242-43.

616. Hawaii Rev. Stat. sec. 54-15 (1976):

"Powers and duties of board.

"The board of water supply shall manage, control, and operate the waterworks of the county and all property thereof, for the purpose of supplying water to the public in the county, and shall collect, receive, expend, and account for all sums of money derived from the operation thereof and all other monies provided for the use or benefit of the waterworks and all property used for or held in connection therewith."

617. Charter of Honolulu art. VII, sec. 7-105 (1976); Charter of the County of Maui art. VIII, sec. 8-11.3 (1976); Charter of the County of Hawaii art. VIII, sec. 8-2 (1976); Charter of the County of Kauai art. XVIII, sec. 18.03 (1976).

618. Hawaii Rev. Stat. ch. 177 (1976).

619. Id. sec. 177-2(3).

620. Honolulu Advertiser, Feb. 23, 1978, at A-1.

621. Honolulu Star-Bulletin and Advertiser, June 18, 1978, at A-3.

622. Hawaii Const. art. X, secs. 1, 2.

623. Id. sec. 2 (emphasis added).

624. Id. sec. 4.

625. Hawaii Rev. Stat. sec. 174-1 (1977).

626. Charter of Honolulu art. VII, sec. 7-103.1 and sec. 7-105 (1976).

627. Hawaii Rev. Stat. sec. 54-15 (1976).

628. For example, in Hawaii Government Employees' Ass'n v. County of Maui, No. 6524 (Hawaii Supreme Court, March 22, 1978), the Employees' Association joined with the State Civil Service Commission and the Maui Board of Water Supply, Police Commission, and Liquor Control Commission to challenge provisions of the Maui County Charter that were allegedly in conflict with state statutes addressing the same subject. The complainants sought to have certain Maui Charter provisions invalidated because:

- (1) they authorized the Maui corporation counsel and the public prosecutor to appoint deputies and staff exempt from civil service regulations, and authorized the Mayor (instead of the Maui Civil Service Commission) to appoint and define the duties of the county director of personnel services (both authorizations allegedly being in conflict with Hawaii Rev. Stat. secs. 76 and 77 which prohibit such employees from exemption under civil service regulations);
- (2) they established a county organizational structure and delegated powers and functions in a manner inconsistent with state statutes by changing the membership requirements of the Police Commission and Board of Water Supply, reducing the autonomous power of the Board of Water Supply to regulate the public water works, changing the method by which the Police Commission could remove the chief of police, setting different criteria as qualifications of the director of the Department of Personnel Services, and changing the appointment requirements for the director of the Department of Liquor Control.

Officials responsible for enforcing the county charter defended the offending provisions on the basis that an exception to legislative control over local affairs is the political subdivisions' right to form its executive, legislative, and administrative structure and organization without legislative interference. The State Constitution art. 7, sec. 2, states:

Each political subdivision shall have power to frame and adopt a charter for its own self-government within such limits and under such procedures as may be prescribed by general law. The prescribed procedures, however, shall not require the approval of a charter by a legislative body.

Charter provisions with respect to a political subdivision's executive, legislative and administrative structure and organization shall be superior to statutory provisions, subject to the authority of the legislature to enact general laws allocating and reallocating powers and functions.

A law may qualify as a general law even though it is inapplicable to one or more counties by reason of the provisions of this section.

The complainants directed the court's attention to Hawaii Rev. Stat. sec. 50-15 (1976), and maintained that all state laws are superior to conflicting county laws on the same subject as stated therein:

Notwithstanding the provisions of this chapter, there is expressly reserved to the state legislature the power to enact all laws of general application throughout the State on matters of concern and interest and laws relating to the fiscal powers of the counties, and neither a charter nor ordinances adopted under a charter shall be in conflict therewith.

The central issue to the court was whether the questioned provisions were concerned with a political subdivision's "structure and organization" powers provided in the state constitution or involved "matters of concern and interest and laws relating to the fiscal powers of the counties" under the state statute. The court held that the merit system was a policy of state government and the state bears certain costs in its administration; therefore, all civil service matters are of statewide concern and the legislature is the final authority in such matters. The court also found, however, that the second group of complaints (see above) involved only local functions and held that nothing restricts a locality from designing a local agency in such a manner as to accommodate local needs. The court provided no generalized rule to distinguish between matters of statewide concern and matters of local political structure and organization.

629. Hawaii Rev. Stat. sec. 177-8(a) (1977); see Appendix III, pages 274-75, for a summary of the 1961 Ground Water Use Act.
630. 1959 Hawaii House Journal, House Standing Committee Report No. 528, at 778.
631. "City" refers to the City and County of Honolulu. Charter of Honolulu art. I, sec. 1-101 (1976).
632. Id. art. VII, sec. 7-103.1 (1976) (emphasis added). "Department" means the governmental unit known as the Board of Water Supply and "board" refers to the seven-member policy-making body of the Board of Water Supply. Id. art. VII, secs. 7-102(a) and (b) (1976).
633. Id. art. VII, sec. 7-105(j)(6) (emphasis added).
634. Written testimony of George Yuen, Presiding Officer, Hawaii State Water Commission, at the Honolulu BWS Public Hearing on Low Ground Water Regulations on Oahu, May 25, 1978.
635. Hawaii Rev. Stat. sec. 177-2(9) (1976).
636. Kunimoto v. Kawakami, 56 Hawaii 582, 545 P.2d 684 (1976).

637. Charter of Honolulu art. V, sec. 5-412.3 (1976).
638. Hawaii Rev. Stat. sec. 50-10 (1976).
639. Kunimoto v. Kawakami, 56 Hawaii 582, 585, 545 P.2d 684, 686 (1976).
640. Id. at 586, 545 P.2d at 687, citing Hawaii Const. art. VII, sec. 2 (emphasis added).
641. Opinion of Samuel P. King, Jr., deputy corporation counsel, March 8, 1978, citing Hawaii Rev. Stat. sec. 54-15 (1976) (printed in note 616, supra).
642. Kunimoto v. Kawakami, 56 Hawaii 582, 586, 545 P.2d 684, 687 (1976).
643. Hawaii Rev. Stat. ch. 177 (1976).
644. Written testimony of Cuyler Shaw, Ashford & Reston, attorneys for Campbell Estate, at the Honolulu BWS Public Hearing on Low Ground Water Regulations on Oahu, May 25, 1978.
645. Written testimony was received from the following persons at the Honolulu BWS Public Hearing on Low Ground Water Regulations on Oahu, May 25, 1978: Mr. George Hudes, Vice-President, Life of the Land; Capt. H. H. Haynes, CEC, USN Commanding Officer, U.S. Navy; Mr. David Ballie, President and Manager, Oahu Sugar Company; Mr. Cuyler Shaw, Ashford & Reston, Attorneys for Campbell Estate; J. I. Frederick Reppun, M.D., Chairman, Kahaluu Neighborhood Bd., No. 29; Patrick Takahashi, President, Oahu Nursery Growers Ass'n; J. N. S. and Janet Thebaud Gillmar.
646. Written testimony of David Ballie, President and Manager, Oahu Sugar Company, at the Honolulu BWS Public Hearing on Low Ground Water Regulations on Oahu, May 25, 1978.
647. Id.
648. Written testimony of Cuyler Shaw and David Ballie, supra notes 644 and 646.
649. City Mill Co. v. Honolulu Sewer and Water Commission, 30 Hawaii 912 (1929); see the discussion of this case at pages 291-94.
650. Charter of Honolulu art. VII, sec. 7-105(j)(6) (1976) (emphasis added).
651. Kahuku, Kaneohe, Honolulu, Ewa-Pearl Harbor, Waianae, Waialua.
652. Written testimony of Capt. H. H. Haynes and David Ballie, supra notes 645 and 646.
653. Written testimony of David Ballie, supra note 646.

- 654. Written testimony of Capt. H. H. Haynes, supra note 645.
- 655. Written testimony of David Ballie, supra note 646.
- 656. Id.
- 657. Written testimony of Capt. H. H. Haynes, supra note 645.
- 658. Cappaert v. United States, 426 U.S. 128 (1976); see also United States v. New Mexico, 46 U.S.L.W. 5010 (U.S., July 3, 1978).
- 659. Cappaert v. United States, 426 U.S. at 138 (emphasis added).
- 660. Id. at 139.
- 661. Opinion of Samuel P. King, Jr., supra note 641.
- 662. City Mill Co. v. Honolulu Sewer and Water Commission, 30 Hawaii 912 (1929); see pages 291-94.
- 663. Cappaert v. United States, 426 U.S. 128, 143 (1976).
- 664. Id. at 145.
- 665. Written testimony of Capt. H. H. Haynes, supra note 645.
- 666. Winters v. United States, 207 U.S. 564 (1908); see also United States v. New Mexico, 46 U.S.L.W. 5010 (U.S., July 3, 1978).
- 667. See generally, Note, Water and Water Courses - Limiting the Reservation Doctrine: Mimbres Valley Irrigation Co. v. Salopek, 13 U. of Wyo. Land and Water L. Rev. 501 (1978); United States v. New Mexico, 46 U.S.L.W. 5010 (U.S., July 3, 1978).
- 668. Hawaiian Homes Commission Act, 1920, Act of July 9, 1921, c 42, 42 Stat. 108 (the Act is now part of the Hawaii Constitution and is subject to amendment or repeal as provided in Hawaii Const. art. XI).
- 669. Id. tit. 2, sec. 202.
- 670. Id. tit. 2, sec. 208(2).
- 671. Id. tit. 2, sec. 208(3).
- 672. Id. tit. 2, sec. 221(a)(2).
- 673. Id. tit. 2, sec. 221(c).
- 674. Id. tit. 2, sec. 221(b).
- 675. An Act to Provide a Government for the Territory of Hawaii, Act of April 30, 1900, C339, 31 Stat. 141, sec. 73(a)(3) (as amended, 1976).

- 676. An Act to Provide for the Admission of the State of Hawaii into the Union, Act of March 18, 1959, Pub L. 86-3, 73 Stat. 4, sec. 4.
- 677. Hawaii Const. art. XI, sec. 2.
- 678. Written testimony of Mr. George Yuen, supra note 634.
- 679. Id.
- 680. State Water Commission, Water Policies for Hawaii 29-30 (Report to the Governor, Preliminary Draft, Oct. 20, 1978).
- 681. Hawaii Const. art. XI, sec. 7 (added 1978).
- 682. 54 Hawaii 174, 504 P.2d 1330 (1973), aff'd on rehearing, 55 Hawaii 260, 517 P.2d 26 (1973), cert. denied, 417 U.S. 962 (1974).
- 683. See pages 176-94.
- 684. See, e.g., Carter v. Territory, 24 Hawaii 47 (1917), and Territory v. Gay, 31 Hawaii 376 (1930).
- 685. See, e.g., W. Hutchins, Hawaiian System, supra note 23.
- 686. Carter v. Territory, 24 Hawaii 47 (1917).
- 687. Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675 (1904).
- 688. Territory v. Gay, 31 Hawaii 376 (1930).
- 689. Id.
- 690. City Mill Co. v. Honolulu Sewer and Water Comm'n, 30 Hawaii 912 (1929).
- 691. For a full analysis of McBryde see pages 194-98.
- 692. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 189 n. 15, 504 P.2d 1330, 1340 n. 15 (1973).
- 693. Hawaiian Commercial and Sugar Co. v. Wailuku Sugar Co., 15 Hawaii 675 (1904); Territory v. Gay, 31 Hawaii 376 (1930).
- 694. See pages 218-41 for a full discussion of water rights in other jurisdictions.
- 695. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 191, 198, 200, 504 P.2d 1330, 1341, 1344, 1345 (1973).
- 696. Id. at 199, 504 P.2d at 1345; see also id. at 198, 504 P.2d at 1344.

697. Id. at 185-87, 191-97, 504 P.2d at 1338-39, 1341-44.
698. Id. at 189 n. 15, 504 P.2d at 1340 n. 15.
699. See pages 213-15 for a more detailed analysis of this issue.
700. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 504 P.2d 1330 (1973), aff'd on rehearing, 55 Hawaii 260, 517 P.2d 26 (1973), cert. denied, 417 U.S. 962 (1974).
701. 441 F. Supp. 559 (D. Hawaii 1977).
702. See, e.g., Warth v. Seldin, 422 U.S. 490 (1975); O'Shea v. Littleton, 414 U.S. 488 (1974); Rizzo v. Goode, 423 U.S. 362 (1976); Reetz v. Bozanich, 397 U.S. 82 (1970); Lake Carriers' Association v. MacMullan, 406 U.S. 498 (1972).
703. See pages 200-18 for a full discussion of the current federal litigation.
704. State Water Commission, supra note 680, at 34-36.
705. Id. at 35.
706. Id.
707. See pages 221-22.
708. See generally, Ausness, supra note 573, at 253-54 (citing State ex rel Emery v. Knapp, 207 P.2d 440 (Kan. 1949) and Knight v. Grimes, 127 N.W.2d 708 (S.D. 1964)).
709. Conversations with Professor Robert Anderson, of the University of Hawaii Economics Department, and his task force on the management aspects of water use, August, 1978.
710. Id.
711. State Water Commission, supra note 680, at 35.
712. See pages 230-37 for a full discussion of judicial decisions in other states that have faced this issue.
713. See pages 167-69 for examples of this phenomenon.
714. See pages 218-41.
715. Hawaii Const. art. XI, sec. 7 (added 1978).
716. See pages 255-59.

717. Hawaii Rev. Stat. sec. 177-33(a)(2)(A) (1976); see also id. sec. 177-22.
718. Id. sec. 177-16.
719. Id. sec. 177-33.
720. Id. sec. 177-29.
721. Id. sec. 177-33.
722. Hawaii Const. art. XI, sec. 7 (added 1978).
723. Id.
724. Cal. Const. art. X, Sec. 2 (West, Supp. 1977); see pages 235-36 for a full discussion of this amendment.
725. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 504 P.2d 1330 (1973).
726. See, e.g., the Florida and New Jersey statutes discussed on pages 221-22 and notes 483-89, supra.
727. State Water Commission, supra note 680, at 34-36.
728. Id. at 35.
729. See generally, pages 154-60 and 175-76.
730. Hawaii Rev. Stat. sec. 177-13(a) (1976).
731. State Water Commission, supra note 680, at 35.
732. Hawaii Rev. Stat. sec. 177-13(a) (1976).
733. See, e.g., Florida Water Resources Act of 1972, Fla. Stat. Ann. sec. 373.243 (West 1974) (quoted in note 483, supra) and N. J. Stat. Ann. sec. 58:1-41 (1977) (quoted in note 488, supra).
734. State Water Commission, supra note 680, at 35.
735. Id. at 34-36.
736. Hawaiian Almanac and Annual, subsequently known as Thrum's Hawaiian Annual and Standard Guide: All About Hawaii (yearly compilations 1875-1949).
737. Biennial Report of the Minister of the Interior to the Legislative Assembly of 1888 170-71 (1888).