Water Conservation Districts

problems in the use of the public district for ground-water management require organizational flexibility in procedures

Stephen C. Smith

Ground water generally has been physically and economically accessible to the individual overlying user. Only within the past three decades has public discussion been focused upon the potential benefits from coordinating individual development.

The increasing depth to water—accompanied by rising costs of water—has been one of the most important factors centering public attention upon the need for coordination. This problem, along with others, can be alleviated through programs of ground-water management. For example, the depth to water may be reduced by recharging the ground-water reservoir; salt-water intrusion may be abated by maintaining a fresh-water barrier; wells near the recharge area may eliminate rejected recharge; winter surface water may be stored underground for use during the summer; and discharge may take place at a planned rate by controlled pumping.

The execution of such water management programs generally is beyond the single water user's scope of action. Thus, the problem is one of creating an organization to interrelate the water users and to interrelate surface water with ground water so that effective water management will result. One method of organizing collective action for ground-water management has been the public district.

In California the correlative rights doctrine has thrown the responsibility for instituting ground-water management upon local water users rather than upon a state agency which approves the applications for appropriation. Since overlying landowners have ground-water use rights by virtue of their location, they are in a controlling position with respect to reservoir management. In such a situation, established governmental units generally are not applicable. However, the district is particularly adaptable as a ground-water management agency because it may be created and controlled by the ground-water users.

Flexibility and Rigidity

As a form of organization, the public district has served both the interests favoring organizational flexibility and the interests opposed to a change in the distribution of resource use.

Organizational flexibility has its geographic and its time dimensions. Geographic flexibility is reflected by the use of California's 30 general and 40 special water district enabling laws. Under these laws, the public district has been applied to local water management problems under a wide variety of physical and social conditions. By passing special legislation, provisions have been included in the enabling acts which the local interests have felt would be most essential to their particular locality. However, most of the 220 water management districts in California—111 irrigation, 91 county water, and 18 water conservation—use one of the 30 general enabling acts. Flexibility is achieved from the selection of the particular act to be used and from the fact that one act may be adapted to meet the needs of many localities.

Geographic flexibility is a particularly useful attribute when dealing with problems of local ground-water management. In one instance, ground-water recharge may be simple with excess water available; in another instance, well-spacing may be called for and artificial recharge may be impossible, or water may be purchased for recharging purposes and a levy may be placed upon the draft of each water user as a means for paying the purchase price. Such local variability of ground-water management problems is a general characteristic.

Flexibility over time also is an attribute of the district form of organization and comes from the fact that the district is created by the local people under the authority of state law. If a new condition arises demanding a change in the powers granted to a district, a change can usually be made with the consent of the legislature and the local people.

Although the district form of organization permits flexibility in ground-water management, it may also be used as an instrument inhibiting change. This role largely stems from the ability of the district to hold property rights and to serve as a means for determining the distribution of benefits within its boundary.

Conflicts of Interest

The American political economy has been built by developing representative procedures for reaching decisions where private interests conflict and for intermeshing freedom with controls. The public district uses one of the traditional means for reaching agreement among conflicting interests. The election process is relied upon as a primary procedure for determining the extent of common interest and for defining the immediate opportunities for public action. The election procedure has been used by water conservation districts to determine whether the statutory common interest existed for creating the district, for electing the board of directors, and for approving the issuance of bonds.

Conflicts of interest frequently develop over two interrelated types of issues: *1*, the proposed plans for action and *2*, the terms of organization. The plans for action often engender conflict since they relate the individual water user to the benefits from the proposed collective action. The terms of organization may be a source of conflict since they are concerned with the repayment proposal and with questions of project control. In these situations of conflict the district election procedure has been successfully used to reach decisions.

Incidence of Benefit

An important problem in using the district as a ground-water management agency is the determination of the geographic area of administration. Conflicts of interest frequently arise because of variations in the expectations of the incidence of benefit from ground-water management. These variations may be due in part to the physical characteristics of the ground-water reservoir and are evidenced in specific localities. For example, if a pressure area axists in the ground-water reservoir, changes in water level resulting from water spreading may be quite different from changes in the nonpressure zone. Or people living in one section of a valley may fear that the diversion of water for spreading to some other area of the valley will result in no benefit to them, or that water releases following winter rains will create soil drainage problems. Because of factors such as these the boundary decision becomes important.

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The experience of the two water conservation districts in Santa Clara County illustrates the role of the public district in dealing with conflicts of this type. The Santa Clara Valley Water Conservation District was organized in 1929 after two attempts to use alternative boundaries. The South Santa Clara Valley Water Conservation District was created in 1938. This southern district was unable to execute its program until the original area within the district was enlarged in 1951 from 18,000 acres to 34,900 acres. In both cases difficulties were encountered in reaching agreement on the incidence of benefits.

One of the primary purposes of the district was to encompass within its boundaries the interests which were to be benefited from the collective action so that the costs of executing the action could fall upon these benefited interests. However, the anticipated benefits from the early water management proposals were not distributed uniformly to all ground-water users.

Santa Clara County contains two distinct ground-water basins, one sloping north toward San Francisco Bay while the other slopes toward the Pajaro River in the south. The small Coyote Valley connects the larger northern and southern basins. Water users in Coyote Valley were reluctant to join the district because they feared detention dams and stream flow diversion would lessen the ample volume of influent seepage of water from the stream to their portion of the ground-water reservoir and that the management of the poorly drained areas would become more difficult. In addition, water spreading at a lower elevation in either district would have been of no benefit. Consequently, Coyote Valley was omitted from inclusion in the two original districts. In fact, the Central Santa Clara Valley Water Conservation District was formed to protest a water-right application by the northern district. With the failure of this action, Coyote Valley was annexed to the Santa Clara Valley Water Conservation District in 1952 and the original plan was adjusted to provide benefit to the area.

The district procedure provided for local interests to register their approval or disapproval with respect to the proposed plan. In these instances the lack of coincidence of district and basin boundaries was a factor leading to conflict and contributing to delay in the initiation of effective ground-water management.

The method of assessing project costs is one of the terms of organization which is frequently a source of conflict with respect to ground-water management. These conflicts of interest center around the question of whether the distribution of costs reflects a reasonable relationship to the distribution of benefits. In the case of the attempt to establish a ground water management organization in Santa Clara County, agreement was not reached concerning the method for raising revenue until four methods had been considered: *1*, a tax upon each parcel of land proportionate to the project benefits assessed to it; *2*, a tax upon the quantity of water pumped from each well; *3*, an assessment upon the value of the land and improvements; and *4*, taxing the land—exclusive of improvements—which was the method that finally won general agreement and was incorporated into enabling legislation of 1929.

The role of the district in these conflicts of interest was to provide the means for reaching a decision in a situation of conflict and to have the authority to collect the required revenue. The election procedure and informal interest group committee were used to settle these conflicting interests. The authority of these districts to collect revenues was never seriously questioned although the ability to issue bonds and the size of bond issues did become questions of electoral conflict.

The district form provides a flexible management tool for determining the incidence of project costs or, to put it differently, of pricing the services rendered. Because of this flexibility, revenue or pricing schemes may be used to fit local ground-water management problems so that there is a coincidence of the incidence of project benefits and costs or that a reasonable relationship exists between them.

The ability of the district to associate costs with benefits should not be confused with the incidence of expenditure. In fact, the largest expenditures of the water conservation districts in Santa Clara County were made to construct detention dams outside of the district. This would suggest that, if a particular watershed management practice in the area above the reservoirs were measurably beneficial to the district program, the incidence of expenditure could be made to fall upon the landowners above the dam while the incidence of cost and of benefit would be within the district or could be partially shared by the district. For example, the district could enter into contractual arrangements with the watershed landowners and pay them to follow agreed-upon practices.

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EFFICIENCY

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ately brought to the laboratory, weighed and dried for 24 hours at 230°F to determine moisture percentage on a dry basis.

About 43″ of water were applied to the test plot during the season by seven irrigations with the individual amounts varying from 5″–8″ at an average of about 6″. The soil moisture extraction during the period of the seven irrigations in 9′ of the soil profile was 36″. The 7″ difference between the 36″ and the 43″ applied can be attributed to deep percolation below the root zone.

The water application efficiency or amount of water retained in the root zone divided by the amount applied was 84%. This is a high efficiency, as should be expected with an irrigation system wherein large flows of water are contained in relatively small areas. The total amount of water consumed from the time that leaves appeared on the trees, in the middle of March, until the time they were shed, around the first of November, was nearly 44″. The 8″ difference between total water consumed and water furnished by irrigation is attributable to winter rains. Of the total water consumed 23% was extracted from the top foot of soil; 63% extracted from the top 5′; and 87% from the top 7′.

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Other studies include the development of reconnaissance techniques to evaluate rainfall disposal and possibilities of yield increase, and to investigate watershed paving as a possible means of yield maximization and debris control.

The potentialities of vegetation management as a means of increasing California water supplies are being considered in detail. Early results indicate that vegetative management may be a new tool to assist in the beneficial utilization of watersheds to produce increased runoff.

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