

PERSPECTIVE ON WATER MANAGEMENT IN MISSISSIPPI BASED ON COMPARISONS WITH OTHER STATES AND A SURVEY OF IN-STATE WATER MANAGERS

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Water rich states, who in the past have depended on abundant water resources, particularly groundwater, for attraction and support of industry and agriculture, now realize that proper management of these resources will be required if supplies are to be available in the future. To illustrate, in the State of Mississippi approximately 90% of all drinking water, over 50% of all industrial process water and over 80% of irrigation and rice farming water come from the ground. Hence, a comprehensive integrated groundwater-surface water resource management plan is needed for Mississippi, if the state is to be in a position of not allowing water resources to inhibit full economic growth and development.

In order to develop guidelines for an effective water management plan for Mississippi, other states' water management plans were assessed, and a survey of Mississippi's water managers was conducted. The results of these studies are discussed in the next sections.

NATIONAL PERSPECTIVE

Almost everyone in the water resources/users system appears to be in favor of moving water management practice to an "integrated" or "unified" planning and management system. However, because of inter-governmental attributes of the water policy network, formulation and implementation of an "integrated" system does not occur. To gauge the degree to which state governments have moved toward "integrated" water policy and management, all fifty states were contacted and requested to supply state water documents. Documents were obtained from thirty-one respondents and were evaluated by classifying them along several analytical dimensions.

First, the number of different water entities recognized by state statute was determined with most states statutorily recognizing six to seven types. Second, the move toward centralization of water management was noted to occur without reduction in water related public entities. Third, states were found to vary significantly in the development of their water regulatory capability with almost one-fourth possessing little or no groundwater legislation and about 30% without any legislatively mandated permitting systems for surface water. Fourth, there appeared to be no commonality in degree of development of state water plans. Other dimensions evaluated were related to "integrated" water policy formulation and types of water plans.

STATE PERSPECTIVE

A survey of Mississippi water managers was conducted to assess their perception of water management on the local, substate and state level, and to aid in planning and development of guidelines for future water management in the State. The survey was administered just after passage of the new water laws in the 1985 Mississippi legislative session. One of the laws, House Bill No. 762, provides for a new

regulatory system by creating a permit system for both surface and groundwater, eliminating the prior appropriation doctrine. The other bill, House Bill No. 149, creates a new type of water management district. Several questions on the survey form were directed toward aspects of the new laws.

The survey instrument was sent to 1,104 water system managers in the state. A return of 24% was obtained. Analysis of the results was conducted using the Statistical Package for the Social Sciences (SPSS) -Level 9. Responses were received from 70 of the 82 counties, and 34% of the forms were returned by municipalities.

Adequacy of Supply

Figure 1 presents a cross-tabulation of a profile of responses to adequacy of the local water supply. In each block the upper numbers represent the number of respondents, while the lower numbers are block percentages. The number 9 beside a column or row represents respondents who did not answer that particular question. About one-fourth to one-third of each group, i.e., county, municipality, etc., thought their supplies to be adequate indefinitely, while 17.4% of all groups thought their supply to be adequate only for the next five years. It is important to note that 70% of the responses received were from areas of the State that have been identified as "critical" areas in terms of diminishing groundwater resources.

Pricing and Conservation

Since House Bill No. 762 will require metering at wells, respondents were questioned regarding the frequency that water supplied and water used were measured. About 27% indicated they never measured quantity supplied and 13% never measured quantity used. Over 50% indicated that they used the declining block method for pricing water. (See Figure 2) In this method the customer is charged a certain amount for an initial quantity or "block" and the rate for succeeding blocks decreases. This method discourages water conservation, and in a follow-up question on whether they engaged in any conservation measures, 77% of the group gave a negative response. Seventy-four percent of the respondents selected promoting consumer education, followed by implementing leak detection and repair programs, selected by 66%, as measures of water conservation in critical areas. Only 17% indicated they had an emergency preparedness plan for water shortage or outage, and most of these plans were for natural disasters.

Allocation of Water Supplies and Permitting

The respondents were asked to indicate the actions they could support if the state had to act to provide adequate water supplies. Figure 3 represents the responses received. About 67% supported allowing

local water districts to join together as needed to plan for future water supplies (Figure 3a); less than one-fourth supported allowing the state to act to allocate water among different users (Figure 3b), and only 22% desired the state to establish area-wide water management authorities with authority to determine priorities (Figure 3c) and only 15% wanted the state to establish water financing priorities (Figure 3d). In concept then, water managers should be responsive to the legislatively mandated establishment of water districts, if they are construed as local.

The respondents were asked to rank water users by preference in allocation of water during critical events. The ranking was as follows: first, public water supplies (87%); second, agriculture (32%); third, industry (25%); and fourth, commercial (25%).

In answering the question "How do you think water should be managed if regulation is required?", permitting and pricing received about the same percentage response, i.e., 34% and 33%, respectively. (See Figure 4) Designation of a critical area received about 26% of the vote with other methods about 2%.

Specific responses regarding permitting were then requested. Figure 5 indicates that 59% desired a limited term permit with renewal only upon application. Automatic renewal limited term was selected by about 27% with permanent permits indicated by only 10%. The recently enacted permitting process will be limited term with renewal requested. The majority of the population favored this already mandated requirement.

Responding to where the permit process should be applied, 51% were in favor of only applying it to selective critical areas with 43% supporting statewide application. The recent legislation applies statewide. Forty-four percent indicated that a water allocation permit should be priced on the basis of quantity used; thirty-two percent selected the option administrative plus quantity used, while 16% checked only a base fee. (See Figure 6) The permitting agency was selected to be the local authority by 48% of the respondents. The state garnered 31% support and a regional authority 13%. (See Figure 7) The state by law is now the permitting agency, i.e., the Department of Natural Resources.

The selection by respondents of local authority as the permitting agency extended to 41% of them opting for the local water supplier to resolve conflicts from an allocation system. From Figure 8, it will also be noted that about 28% wanted a state administrative agency and 25% desired regional water management districts to resolve conflicts.

The water managers were asked to select what they deemed mandatory on well permits. Well spacing requirements and maximum pumping rate were selected by 64 and 63%, respectively. Well depth limits, required measuring devices and plugging of abandoned wells were checked by about half of the respondents. Plugging of artesian wells was mentioned by about one-third. Over 75% of the ones surveyed checked mandatory fee assessment for a drilling permit, well registration, driller's license, withdrawal permit and emergency permit.

Water Management

Figure 9 illustrates the responses received for jurisdictional lines for regional water agencies. Sixty-two percent of the respondents selected soil and water conservation districts for regional management. River basin districts were selected by about 14% with 7% selecting flood control districts. "Other" regional lines noted were "local."

From Figure 10, 58% wanted management of groundwater in critical areas to be handled by apportioning among users. Other choices made were use pricing (15%), closing aquifer to new users (10%), rotating uses (7%), and other (3%). Seven percent did not respond.

"Equally among all users" was the basis for apportioning selected by 43%. Closely following this selection was a "priority use formula" checked by 34%. (See Figure 11) The other options of "priority date on user's water permit, adjustable pricing and other" were selected

by less than 10% of the respondents.

For designated water management districts, the majority desired that the Board of Directors be elected by electors in local water management jurisdictions; about one-fourth opted for appointment by local officials. (See Figure 12) The other options of appointment by Governor/Legislature or State were less popular.

When asked "Should the Mississippi Legislature enact legislation to devise a system of statewide or regional management of water supplies?", 52% responded affirmatively. In response to the question "What aspects of expansion in the State's role would your water association district support?", "strong support" was given to the following concepts in rank order: regional planning, financing, technical assistance, coordinating federal-state-local programs, regulating raw water supplies, coordinating state programs and resolving inter-local disputes.

Information and Level of Assistance Provided by Government or Other Agencies

In response to the question "Does your water district rely upon other agencies for information related to water supply planning and decision making?", 45% gave an affirmative reply, 14% didn't know and the remainder gave a negative response. Those responding affirmatively were requested to gauge the degree of information received from several agencies.

Twenty-five percent indicated that "quite often" they received help from the Farmers Home Administration (FHA) and 31% indicated help "sometimes." The Bureau of Pollution Control (BPC) supplied information to 18% of the people "sometimes," while one-third were given information by the Department of Health (DOH) at least "sometimes" or "quite often." Only 16% received information from the Bureau of Land and Water Resources (BL&WR) "sometimes" and 8% "often." This will be required to change in the near future, since this agency will be the permitting agency for the new water legislation.

In follow-up to asking them to indicate what agencies and to what degree supplied information, the respondents were asked to gauge which agencies provided the most assistance in helping them to manage their water supply problems. One-half of the respondents indicated the FHA to be "most helpful." Sixty percent indicated the DOH to be "most helpful." Since the FHA basically provides funding and the DOH provides technical service, it is difficult to define if assistance is financial or technical in nature. Only eighteen percent considered the BL&WR, probably because of its past mission guidelines, to provide a high level of assistance. By nature of its expanding role, this perception of assistance should improve.

Factors Contributing to and Hindering Effective Management

Seven factors that have contributed the most to or facilitated effective coordination of water supply policies and programs were assessed. Of these seven factors public demand and local elected official leadership were indicated to have the greatest effect in the region with the latter being ranked first by 27%. Existing federal policies, administrative and professional means, state government organization, research and information sources and state legislation were listed in the order presented. This response was also the general sentiment of local and state officials during personal interviews.

Selected factors that have significantly hindered the water districts in dealing with problems were also addressed. Not surprisingly, lack of financial capability was marked the most frequently and sighted by 44% as the highest factor. Lack of public interest and lack of trained personnel were the next factors listed. The other factors of fragmentation of organizational responsibilities, inability of local government to work together, inability of state government to provide leadership and lack of adequate information were not perceived to be significant, and were noted generally by less than 5%.

Knowledge of New Legislation

The Mississippi Legislature, as mentioned previously, has authorized the establishment of joint local water management districts, as well as modification in the state's regulation of water by including groundwater. This study indicated that about 72% of the people surveyed had not heard or read anything about this new legislation (Figure 13a). Figure 13b shows their response to the legislation regarding water districts – 17% opposed, 47% favored, 2.3% did not know and 33.3% did not answer. Regarding the legislation on groundwater regulations 12.3% opposed, 48.9% favored, 2.7% did not know, and 36.1% did not respond (Figure 13c).

SUMMARY

To summarize some of the results obtained from the survey, the following points are made:

- 1) More public education is needed to increase the awareness level regarding the fact that water supplies are not available indefinitely, if they are used unwisely. Over one-fourth of the population surveyed believed supplies were available indefinitely.
- 2) Presently employed pricing methods for water are not conducive to water conservation, nor financial solvency, and changes in pricing methods should be initiated, particularly in those areas of the state where water is in critical supply.
- 3) Poor maintenance of distribution systems correlated with financial problems, partially stemming from pricing methods, are contributors to water misuse.
- 4) Lack of consumer education was perceived by 74% of the respondents as the major factor hindering water conservation.
- 5) Emergency preparedness plans should be developed on the local level in the event of critical water supply problems; only 17% of the population had such plans.
- 6) In order to extend water service and/or to meet water demands, the most popular revenue raising devices were to pass charges on to the consumers. Hence, it would appear that in "crisis" situations the water managers are willing to make the unpopular choice of raising prices.
- 7) Two-thirds of the respondents supported allowing local water districts to join together as needed to plan for future water supplies; however, state action such as allocation of water, establishing water financing priorities, or establishing area water management authorities was supported by less than one-fourth of the population.

8) In the event that preferences in allocation of water must be made, the respondents clearly indicated that public water supply should be first; however, the remaining choice in allocation was dependent on the local economic base. As part of emergency preparedness plans, clear choices in allocations should be made to avoid "incorrect" choices during a crisis period.

9) Regarding water permitting, a majority did not support any one particular method of pricing; however, the highest selection 44%, was for pricing on the basis of quantity used. Only about one-third supported letting the state be the permitting agency. Since the state (DNR) has been designated the permitting agency, care needs to be taken in informing the water managers of the new law and how it applies to them in order to achieve maximum cooperation. In addition, there appears to be support for mandatory fee assessments for driller's license, withdrawal permit, drilling permit, well registration and emergency permit.

10) Soil and water conservation districts were designated by 62% of the respondents as the appropriate jurisdictional lines for regional water agencies.

11) State and substate level planning should include as a major component procedures for cooperation and sharing among districts.

12) The major keys to effective management at the substate level were considered to be public demand and local elected official leadership.

The need for management of water resources in the State of Mississippi has a strong technical base. House Bills No. 762 and 149 are now law and serve as a legal and institutional framework for effective water management. The stage is set for a definitive State water management plan and authority.

Before truly integrated implementation of a state water management plan and authority can occur, it would appear that several details must be finalized. First, centralization of water authority is needed with a reduction in the types of statutorily recognized water related public entities. Missions of several state agencies need to be redefined to include conjunctive consideration of groundwater and surface water along with elimination of overlapping agency functions. Third, financial means for research, development and safeguarding of water resources should be established. Fourth, a data management system for both surface and groundwater must be selected, developed, computerized and maintained. Finally, public education must be provided, particularly in the areas of conservation, water pricing and emergency response.

COUNT COL PCT	AGENCY						ROW TOTAL	
	COUNTY	MUNIC.	PRIVATE	RURAL	OTHER			
	1	2	3	5	8	9		
NEXT 5 YEARS	1.	4	13	11	1	9	0	38
		19.0	17.3	15.9	8.3	22.5	.0	17.4
NEXT 10 YEARS	2.	4	16	18	3	10	0	51
		19.0	21.3	26.1	25.0	25.0	.0	23.3
NEXT 20 YEARS	3.	6	22	15	3	10	0	56
		28.6	19.2	21.7	25.0	25.0	.0	25.6
INDEFINITELY	4.	7	18	22	4	10	1	62
		33.3	24.0	31.9	33.3	25.0	50.0	28.3
DONT KNOW	7.	0	1	0	0	0	0	1
		.0	1.3	.0	.0	.0	.0	.5
	9.	0	5	3	1	1	1	11
		.0	6.7	4.3	8.3	2.4	50.0	5.0
COLUMN		21	75	69	12	40	2	219
TOTAL		9.6	34.2	31.5	5.5	18.3	.9	100.0

Figure 1: Perceived Adequacy of Water Supply

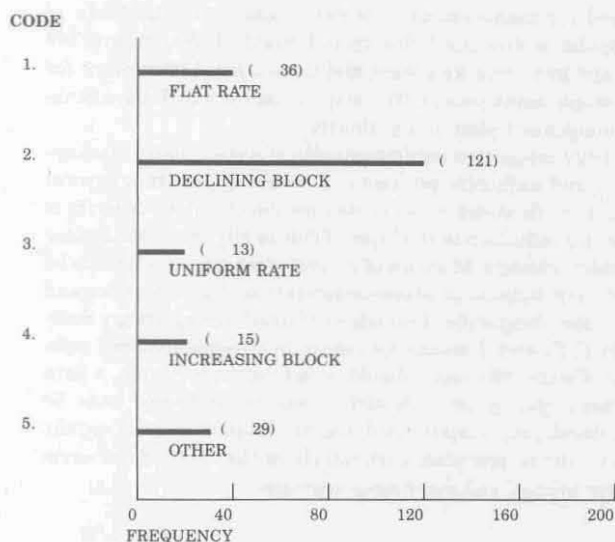


Figure 2: Method of Pricing

	COUNT COL PCT	AGENCY						ROW TOTAL
		COUNTY	MUNIC.	PRIVATE	RURAL	OTHER		
		1.	2.	3.	5.	8.	9.	
NO	0.	10 47.6	26 34.7	16 23.2	2 16.7	13 32.5	0 .0	67 30.6
	1.	10 47.6	47 62.7	52 75.4	10 83.3	26 65.0	1 50.0	146 66.7
YES	9.	1 4.8	2 2.7	1 1.4	0 .0	1 2.5	1 50.0	6 2.7
	COLUMN TOTAL	21 9.6	75 34.2	69 31.5	12 5.5	40 18.3	2 .9	219 100.0

Figure 3a: Assuring Adequate Water Supply by Allowing Local Water Planning Districts

COUNT COL PCT	AGENCY COUNTY	MUNIC.	PRIVATE	RURAL	OTHER	ROW TOTAL		
1.	2.	3.	5.	8.	9.			
NO	0.	15 71.4	60 80.0	52 75.4	10 83.3	30 75.0	1 50.0	168 76.7
	1.	5 23.8	13 17.3	16 23.2	2 16.7	9 22.5	0 0	45 20.5
YES	9.	1 4.8	2 2.7	1 1.4	0 .0	1 2.5	1 50.0	6 2.7
	COLUMN TOTAL	21 9.6	75 34.2	69 31.5	12 5.5	40 18.3	2 9	219 100.0

Figure 3b: Assuring Adequate Water Supply by State Allocating Water to Users Through State Law

	COUNT COL PCT	AGENCY					ROW TOTAL	
		COUNTY	MUNIC.	PRIVATE	RURAL	OTHER		
		1.	2.	3.	5.	8.		9.
NO	0.	18 85.7	55 73.3	54 78.3	10 83.3	28 70.0	1 50.0	166 75.8
	1.	2 9.5	18 24.0	14 20.3	2 16.7	11 27.5	0 .0	47 21.5
YES	9.	1 4.8	2 2.7	1 1.4	0 .0	1 2.5	1 50.0	6 2.7
	COLUMN TOTAL	21 9.6	75 34.2	69 31.5	12 5.5	40 18.3	2 .9	219 100.0

Figure 3c: Assuring Adequate Water Supply by State Establishing Area Water Management Authorities

	COUNT COL PCT	AGENCY					ROW TOTAL	
		COUNTY	MUNIC.	PRIVATE	RURAL	OTHER		
		1.	2.	3.	5.	8.		9.
NO	0.	17 81.0	53 70.7	60 87.0	12 100.0	37 92.5	1 50.0	180 82.2
	1.	3 14.3	20 26.7	8 11.6	0 .0	2 5.0	0 .0	33 15.1
YES	9.	1 4.8	2 2.7	0 1.4	1 .0	1 2.5	1 50.0	6 2.7
	COLUMN TOTAL	21 9.6	75 34.2	69 31.5	12 5.5	40 18.3	2 .9	219 100.0

Figure 3d: Assuring Adequate Water Supply by State Establishing Financing

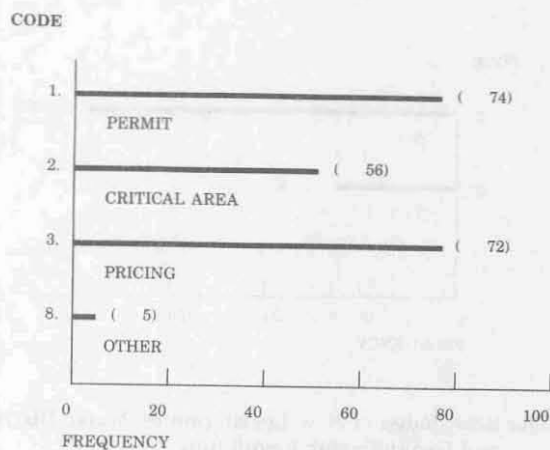


Figure 4: Regulation of Water Use

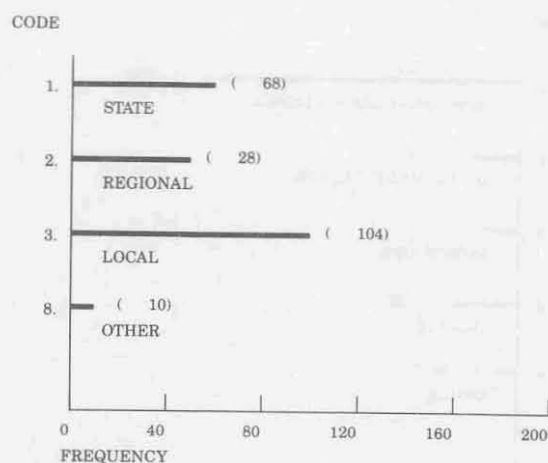


Figure 7: Agency Issuing Permit

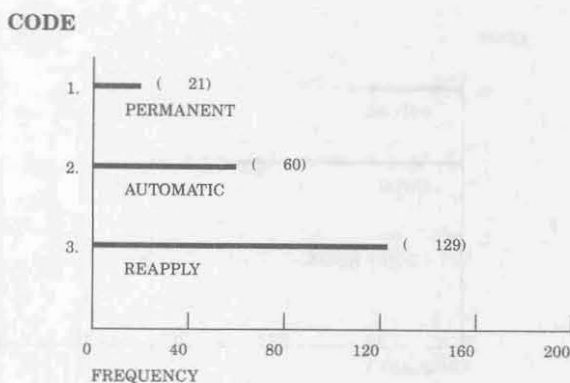


Figure 5: Method of Permit Allocation

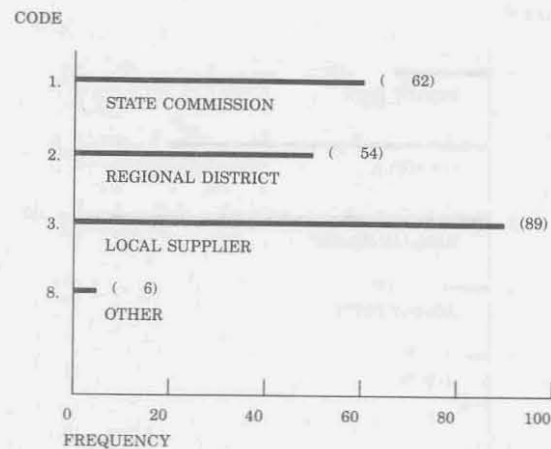


Figure 8: Resolution of Conflicts from Allocation

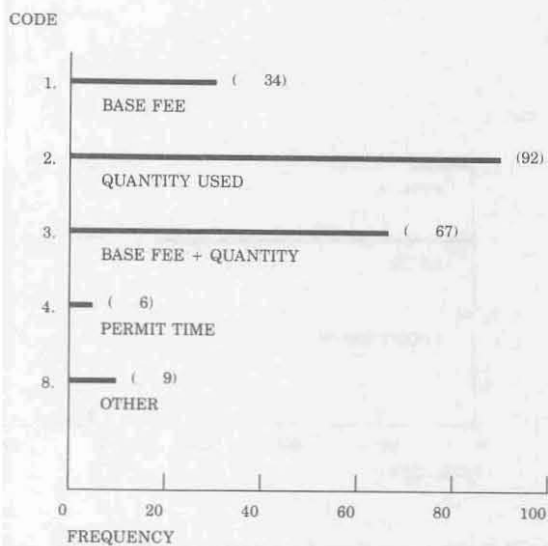


Figure 6: Basis of Price of Permit

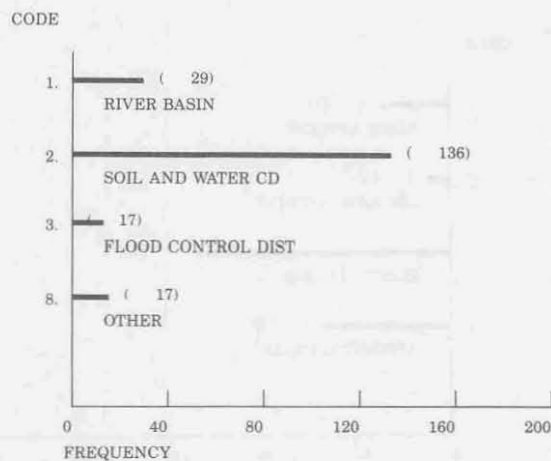


Figure 9: Regional Water Management Area

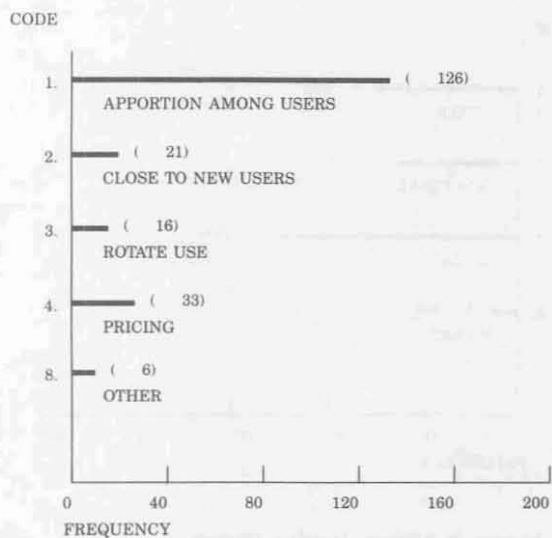


Figure 10: Basis of Management in Critical Area

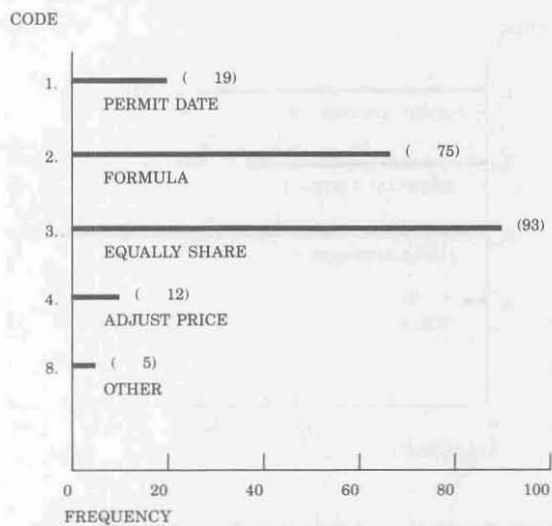


Figure 11: Basis of Apportioning Among Users

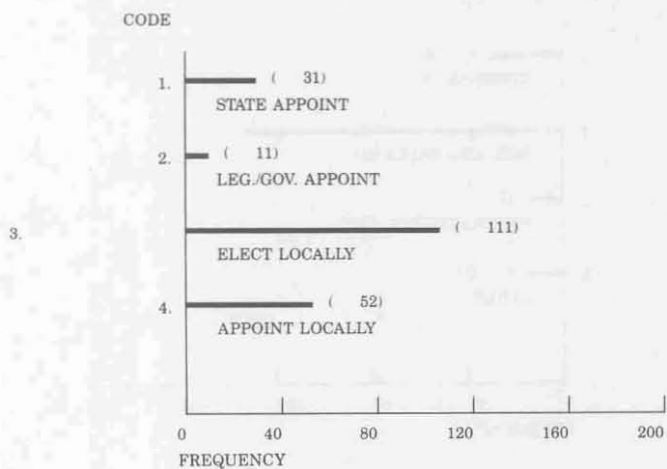


Figure 12: Method of Selection of Board of Directors for Water Management

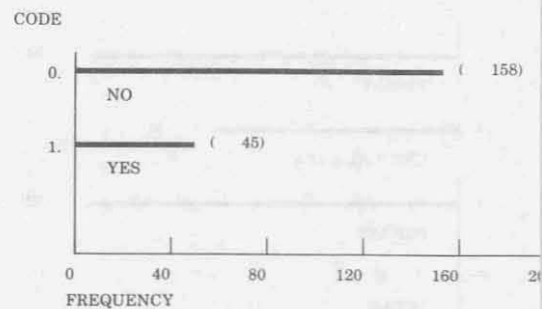


Figure 13a: Knowledge of New Legislation on Water District and Groundwater Regulation

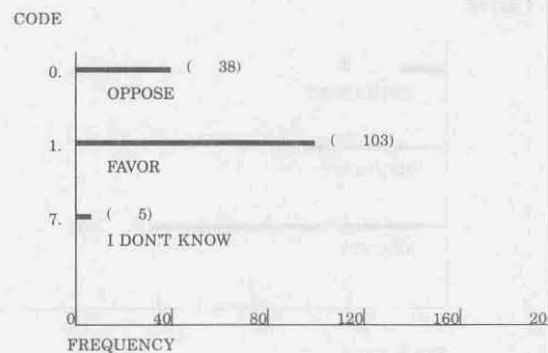


Figure 13b: Responses to New Legislation on Water District

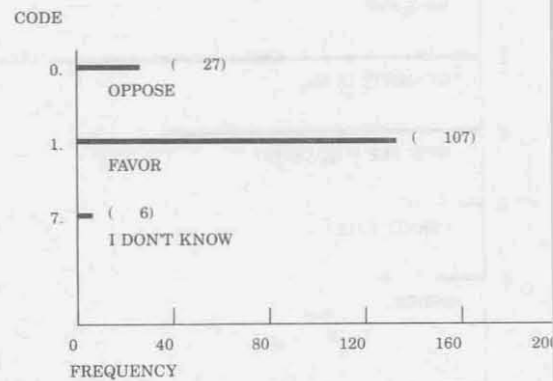


Figure 13c: Responses to New Legislation on Groundwater