

CHALLENGES TO BALANCING CONSERVATION WITH SUPPLY IN INTEGRATED RESOURCE PLANNING

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Integrated Resources Planning (IRP) has evolved from a new planning concept to an acknowledged water supply planning process that goes beyond traditional supply-side planning. This paper discusses IRP planning concepts and challenges to implementing IRP on a regional or statewide scale. Often, planning mechanisms successfully performed by an individual water company or department, face implementation barriers when applied on a statewide or regional basis.

Traditional water supply planning developed computations of safe or firm yield and then plotted these values against demand projections to indicate the timing and the magnitude for the next increment of supply. IRP scrutinizes the conservation or demand side of the equation as much as the supply side. Instead of simply planning to expand sources of supply when demand is projected to increase, various conservation methods are considered to see whether source expansion is warranted in the near or even distant future (Ruzicka and Hartman, 1996). The relationship between supply and demand can be visualized as a balanced scale.

IRP considers conservation efficiencies on a level equal with supply augmentation options (Beecher, 1995). The planning emphasis shifts from an engineering determination of the supply-demand intercept (i.e., when demand will outstrip supply) to maintaining an adequate margin of safety of supply relative to demand. This means determining safe yield for various drought return frequencies, evaluating the risk of shortages, and determining the appropriate margin to be maintained between demand and supply. Reducing demands and increasing supplies are both viable alternatives for consideration.

ACCEPT PROVEN CONSERVATION SAVINGS AND EQUATE CONSERVATION RISK WITH SUPPLY RISK

Conservation can be understood as the next increment of supply. Work needs to be done to assure that water

savings and risks are quantified in a way that makes it possible for water supply engineers and utility managers to compare conservation with supply yield. It is perplexing that some water utilities skeptically view conservation, while at the same time relying on outdated and poorly modeled safe yield analyses of water sources. Risk is perceived differently for the conservation side than for the resource side, while in reality the two forms of risk are essentially the same.

Decision makers are more experienced and comfortable with yield implications and quantifying supply-side risks. For example, safe yield is a theoretical and statistically based construct using historical measurements that generally are considered severely skewed by the period of record and that frequently use poor documentation of historic operating procedures. For firm-yield analyses employing techniques suggested in the literature (Vogel and Fennessey, 1994; Vogel, Fennessey, and Bolognese, 1995), there is still uncertainty regarding the ability of the utility to operate reservoirs in an efficient manner so as to optimize yield

Conservation seems to bring out the skeptics. How many times does one need to document water savings that result from a residential retrofit program or an industrial audit? Savings related to metering and leak detection (on the supply side) are well-known and well-accepted aspects of utility operations. At some point, it should be possible to stop measuring for the sake of proof and begin relying on inherent knowledge based on experience. On the supply side, no one requires meticulous measurement and cost-benefit analysis of reducing excessive dam leakage. It is acknowledged as cost effective and an integral part of prudent utility management. If "proof" of savings were required all the time (as some demand-side pundits are suggesting), then dams might never get repaired.

MOVE SUPPLY MANAGEMENT TO THE CONSERVATION SIDE OF THE IRP EQUATION

Due to increasing technological innovations on the

demand side and environmental permitting minefields on the supply side, one would think that the IRP balance would actually have tilted the planning perspective more to water conservation and efficiency programs. Unfortunately, the traditional water supply planning mindset is hard to overcome. A great many water companies persist in pursuing supply-side alternatives even when environmental impacts are great and permitting success is doubtful and expensive. Some water managers are steadfast in their belief that eventually government will be persuaded to reconsider its position and "Finally recognize that people come before fish."

In eastern states, arguments persist over instream allocations, while in western states arguments persist between agricultural and urban interests. Conservation is not viewed on equal footing with supply options. The supply siders keep adding supply-side options related to reallocation or legal challenges, and raising doubts about the permanency of water conservation savings. The supply-side augmentation or reallocation argument is especially difficult to counter in cases where utilities have installed treatment and developed supply capacity in excess of system demands or needs. (In these cases, regional marketplaces may serve to redistribute supplies to basins experiencing shortages.) The same issues arise in the context of safe yield analyses, including the reliability of yield under changing climatic conditions and the loss of storage due to sedimentation (MacBroom, 1989). Supply-side and demand-side risk need to be fairly equated.

For the demand side and the supply side to remain balanced, supply-management options and utility operations (such as leak detection and control) should be promoted under the umbrella of conservation. Too often, only demand-side efficiency measures are considered water conservation. An increased awareness of the importance of supply management considerations must be emphasized as part of the conservation side of the equation. In other words, supply-side conservation also comes under the conservation rubric and "supply-side management" is another option to consider in the IRP framework. The definition of conservation should not be limited to demand-side or fixture efficiencies. Conservation encompasses all efficiencies, including consumer based approaches and utility based approaches, such as leak detection and repair, metering, conjunctive use, reservoir management, lost water reduction, and optimizing rules and procedures for utility operations.

SHIFT THE IRP BALANCE POINT TO THE UTILITY-RESOURCE INTERFACE

In addition to eradicating the imbalance in perception that magnifies risk on the demand side, IRP practitioners must work to shift the demand and supply balance point from the utility-customer interface (demand management) to the utility-resource interface (supply management). By moving supply-oriented conservation strategies to the opposite side of the scale, the fulcrum pointed is shifted and conservation will receive more attention from water managers. In general, water management and conservation can be viewed separately in terms of resources (supply generation), utility operations (transmission and distribution), and customer usage (audits and retrofits).

STATE AND FEDERAL CHALLENGES IN PROMOTING CONSERVATION

On a state or local government level, conservation is difficult to legislate. Water company executives still do not believe in the permanency of conservation. Where water conservation plans are required, as in Connecticut and Texas, they often become add-ons and separate supplements to water supply plans. Rarely are they integrated into the utility water supply plans in an IRP approach.

Bill Hoffman of Texas has noted, "If a water conservation plan is just being done for a plan's sake, then the plan is a pile of papers, a terrible waste of trees, fills up files, grows mold spores which aggravate your allergies" (Hoffman, 1996). The experience in Connecticut has been similar. In Connecticut, the state requires all large purveyors to prepare water conservation plans (State of Connecticut, 1990). These plans consider a number of conservation measures on paper, but when it comes to the commitment to implementation, little happens. To be effective, conservation must be accounted for in utility demand projections, as reported in their plans.

Government can legislate the preparation of conservation plans and require the consideration of conservation measures in supply planning, but this does not automatically result in IRP. Water conservation can be more effectively regulated on the supply side (the utility-resource interface). Governments can and should set standards for lost and unaccounted-for or non-revenue water losses. Requirements for metering and

non-revenue standards should be prerequisites for supply permits and receipt of state revolving loan funds for system improvements or expansion. Funding for leak detection and repair also can be provided.

Implementation of the recently reauthorized Safe Drinking Water Act includes a provision for water conservation plan guidelines. These guidelines should establish efficiency performance standards as opposed to performance criteria for specific conservation measures. While Connecticut was successful in legislating a required mandatory residential water conservation retrofit program (Ruzicka, Reed, Ducoff-Barone, 1996), this type of program cannot be readily implemented on a regulatory scale nationwide. The goal should not be the number of homes retrofitted or the number of industrial audits performed, it should be water savings at the resource level.. This can be accomplished through customer demand reductions, as well as improved distribution, transmission, treatment and reservoir operational efficiencies.

EFFECTUATE REAL CUSTOMER PARTICIPATION IN THE PLANNING PROCESS

Considering the full range of resource options leads to another aspect of IRP, which is the involvement of entities and individuals located beyond the company walls. While the IRP process includes the public, there is little agreement as to what this entails. From a regulatory perspective, this requires public comment periods and public notification procedures, but true customer involvement requires a different *mindset* on the part of the water utility, not further legislation. It is nearly impossible to legislate a relationship between the purveyor and its customers. Many water companies still pride themselves on being the quiet utility. Failure to truly interact with their customers results in vast misconceptions as to consumer desires and motivations.

In the Connecticut Water Supply Planning Program, each water company is required to maintain a public review copy of their long range water supply plan; a public comment period is provided. The Connecticut water supply planning process maintains a 60-day public comment period in which written comments and objections can be received by state decision makers for consideration (Section 25-32d-1). However, an active public participation component, whereby public input is actively solicited and included in the planning process, is lacking from Connecticut's modified IRP process.

Often IRP projects utilize collaborative or consensus approaches in order to achieve public involvement. This current stakeholder approach is issue oriented. While this approach works well to resolve conflict over resource allocation and management, it does not represent true public involvement in the IRP process. Active public involvement must include potentially affected citizens, especially customers. Customers are not stakeholders to be viewed on an equal basis with other special interest groups; they are the *key* stakeholders with regard to utility financing, costs and benefits, and local decision making. To merely include consumers as one stakeholder diminishes their importance.

To make IRP work, customer viewpoints must be included. This requires more than public information outreach. It requires more than including one or two interested customers on the IRP team. Instead, there must be a rethinking of how to determine and include true public *opinion*. While polling to assess public opinion is not recommended here, a fundamental rethinking of customer roles and interaction with the utility is needed. A consumer advisory board should be an integral part of the IRP process. To foster participation by a wide variety of customers, they must be considered similar to boards of directors and compensated for meeting attendance. It is necessary to treat customer representatives and directors alike in the decision making process and to recognize their anticipated work efforts. The product of the IRP process should integrate the results of public participation.

CONCLUSION

In conclusion, the challenges to implementing IRP planning concepts on a regional or nationwide scale include the need to:

- Accept proven conservation savings.
- Equate conservation risk and supply risk.
- Acknowledge the body of knowledge about conservation and the quantification of savings.
- Shift supply-management and efficiency elements to the conservation side of the IRP equation.
- Shift the IRP balance point to the utility-resource interface.
- Establish performance standards for conservation.
- Effectuate real customer participation in the process.
- Treat customer representatives like directors.

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