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Costs of Alternative Sources of Water for Rural Families

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Water, or the lack of it, is a problem for many rural families. Sometimes the problem is an insufficient supply: other times, the quality of water does not meet acceptable standards. The rural water user is faced with the question, what source of water will provide a sufficient supply of acceptable quality water at the least possible cost?

To answer the question satisfactorily, the user must evaluate the cost of obtaining water from the various sources available to him which may include some or all of the following:private wells, hauled water, rural water system, stock dams, and dugouts. While some of the sources may be interchangeable for all uses, other sources may be limited to only one or two particular uses. For example, a stock dam may provide water for livestock, but not an acceptable quality of water for human use. On the other hand, water from a well may be used for all needs within the farmstead.

Cost Factors

The first step in the evaluation process then becomes one of identifying all possible sources of water for the user.

The second step involves estimating the fixed costs of each source. If interested in merely evaluating costs of alternatives and not in the total cost of delivering water, it is only necessary to compare the costs of the items that differ from system to system.Thus, a distribution system for the farm buildings and plumbing system for the house would be needed for use with all sources. It is not necessary to include these items in the evaluation.

What should be included in the fixed costs? For a private well, the cost of drilling the well, the pump, and all other related equipment would constitute the fixed costs. Hauling water will involve fixed costs for a cistern or some type of holding tank and pump. If the water is hauled by the user himself, a tank and truck will also be needed for hauling. The rural water system customer would normally have no fixed costs beyond the hook-up charge. For the stock dam or dugout,fixed costs of excavation and, if needed, a principal spillway or trickle tube. Subsidies are available to cover part of the costs of construction for some dams and dugouts. The amount of any subsidy should be deducted when estimating fixed costs.

Step three consists of estimating the operating, maintenance,or recurring costs which can be expected with each source. This is perhaps the most difficult part of the evaluation process since one must forecast what will be happening in the future. Here the water user may call upon his previous experience or that of his neighbors to help make reasonably accurate predictions. For the private well, costs will vary from user to user as electricity

costs and amount of water used varies.

For hauled water, recurring costs would include cost of water as well as maintenance and operating costs for any pumps or cisterns used and trucks if the user hauls water himself. The recurring costs for the rural water user are easier to ascertain since the user is billed monthly for the amount of water used. Some sources have stated that maintenance costs for stock dams and dugouts are negligible. The operator must rely on his experience to see whether this is true in his particular case.

Step four is often neglected but is a very important step. Working through steps one to three will reveal that the mixture of fixed cost and recurring costs varies greatly from source to source. Thus, all of the costs must be brought back to some common time period and expressed in dollars of the same value. The usual method is to figure the present value of all costs and then determine which source will provide water at the least possible costs. Another equally acceptable method is to amortize the fixed costs over the life of the equipment, and the annual recurring costs, and compare the annual cost of each source.

Non-monetary Considerations

Convenience, safety, and dependability as well as cost may be important to the user and he may wish to add a factor of his own valuation to the sources which he feels best meet his family and other needs.

General costs figures are available for the user for some of the items but because each location has its own unique characteristics in terms of soil, location, mineral content of the water, topography, etc., each user may find it expedient to perform his own evaluation.

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