

Water Valuation Methodology For Conservation

Introduction



There are many theories and debates on how to value a watershed; the truth is there is no tried and true method. In fact, while natural resources valuation has been around for many years, (such as value of forest or carbon sequestration,) the idea of valuing water is a relatively new field. However, with the ever pressing need to make the link between the users of water, the protection of the water source, and the sustainability of the watershed, The

Nature Conservancy is not only assisting the sites where we are directly involved, but is also helping to set a world agenda for valuing water and the biodiversity linked to that water.

Social science teaches us that the best way to change people's actions is to show them how these changes will benefit them, directly. Few people will disagree, in principal, to the idea that they want a clean and healthy environment. However, to actively engage them in the changes needed, and to perhaps expect them to invest financially, usually requires proof of "what's in it for them".



Bringing together the biodiversity needs of the watersheds with compelling arguments for change are what this ***Water Valuation Methodology*** is attempting to do. The Nature Conservancy is currently engaged in with partner organizations in Bolivia, Ecuador, Jamaica, Guatemala, Colombia, and Mexico to test and improve this methodology.

What do we mean by “Valuation”

Often the term “value” of water is incorrectly interchanged with the terms “price” or “cost”; however, the valuation of water takes into consideration not only market values of water but also non-market values.

To help clarify, it may be easier to first understand what “price” and “cost” of water signifies. The **price of water** is usually set using traditional supply and demand considerations plus the political factors of subsidies. The World Resources Institute estimates that world wide the price of water is about 35% of the cost of water and perhaps only 15% of the value. The **cost of water** is generally calculated using data on costs of extraction, treatment, and transportation. Some institutions, especially privatized companies, will often include the cost of maintenance and future capital investments to meet demand in their calculations of cost. But, even with all of these factors, the total value of water has still not been derived.



To begin to calculate the value of water we may begin with the costs of direct use, but that is only a starting point. It is likely that many of the values that water has may never be able to be calculated because of difficulty in measuring them, however, many of the direct and indirect values can be determined.

Table 1 provides examples of various items to be considered in assigning a value to water.

| Direct Use Costs | Indirect Use Costs | Opportunity Costs | Existential Values | Stewardship Values |
|---|---|--|--|--|
| <ul style="list-style-type: none"> • Human Consumption | <ul style="list-style-type: none"> • Flood Control | <ul style="list-style-type: none"> • Future demand | <ul style="list-style-type: none"> • Religious “value” | <ul style="list-style-type: none"> • Sustainable use for future generations |
| <ul style="list-style-type: none"> • Agriculture | <ul style="list-style-type: none"> • Sediment Retention | <ul style="list-style-type: none"> • Uncertainty of future supply | <ul style="list-style-type: none"> • Cultural “value” | <ul style="list-style-type: none"> • Legacy ??? |
| <ul style="list-style-type: none"> • Hydro-electric | <ul style="list-style-type: none"> • Nutrient transport | <ul style="list-style-type: none"> • Future uses | <ul style="list-style-type: none"> • Scientific “value” | |
| <ul style="list-style-type: none"> • Manufacturing | <ul style="list-style-type: none"> • Flow regulation | | | |
| <ul style="list-style-type: none"> • Mining | <ul style="list-style-type: none"> • Aquaculture | | | |
| <ul style="list-style-type: none"> • Recreation | <ul style="list-style-type: none"> • Climate stabilization | | | |

For conservation organizations, the key focus is how to put **value on the water source and the ecosystem services** needed to protect and ensure the quality and quantity of that

source. Goals for a valuation project may include improved or reduced use of water and/or the inclusion of costs for source and biodiversity protection in water pricing.

Considerations for Site Selection for Water Valuation Projects

Theoretically, potential watersheds for valuation projects where will have gone through TNC's *Eco-Regional* or *Site conservation Planning* (SCP) processes and will have been identified as target areas based on biodiversity priorities. During the *Strategies* portion of the SCP, it is likely that political, social, and economic activities are identified, as well as the scientific conservation approaches, to conserving the area. While there are many approaches to socio/political/economic changes, the *Water Valuation Methodology* (WVM) is proving to be a very effective tool.



Water valuation projects start with an assessment of the scientific and conservation factors for both land and aquatic biodiversity needs.

However, when we start talking about **threats** to biodiversity and systems, such as rivers and streams, we begin to talk about the inter-relation with humans and the uses they make of the land and water. In the WVM process it is essential to

have an understanding of who the users are of the water and how they use it.

Possible Criteria for Choosing Water Sites for a Water Valuation Project

- Conservation Importance
- Hydrological Importance
- Usage Demands
- Legal Framework
- Political Context
- Institutional Capacity to Execute Projects
- Ability of Users to take Action
- Ability of Users to Pay

Goals?

The first thing that should be asked is: **Why are we doing a watershed valuation?** **What are our goals?** The answer will help develop the rest of the water valuation process. All stakeholders should be asked this question. It is often the case that during a water valuation process the group assumes they are all of the same mind, until this question is discussed. Depending on the answer to **Why**, the Where? and the Who? can vary.

Some of the answers may be:



To show the value of protecting the water source.
To show the value of water to the consumers.
To create a fund for the protection of the watershed

There is no right answer, and there might be more than one, but it should be clear what the priority and expected outcome of the valuation process should be.

Who are the users?

The next step in the WVM is to identify who uses the water in the watershed and for what purposes. This discussion may lead to the identification of sub-watersheds with different users and uses. Typical answers will be: agriculture (this should be broken down by type and size); users of potable water; hydroelectric plants; and industry.



Next comes **prioritizing these users and uses based on the goals you have identified for your valuation study**. Again, it is worth mentioning that the entire watershed, or its biodiversity is not being valued, but rather objectives are being set for measuring parts of the watershed services to begin a conservation process.

Table 2 shows examples of users, their uses and associated effects on the watershed.

| User | Uses | Effects |
|----------------|----------------|---|
| Small Farmer | Irrigation | Consumption/quantity Soil Erosion/Sedimentation Change in natural flow Run-off |
| | Grazing | Contamination Soil Compaction |
| | Domestic Use | Contamination |
| Agro-business | Irrigation | High consumption Soil Erosion/Sedimentation Change in natural flow Toxic Run-off |
| | Processing | High consumption Wastewater contamination |
| Domestic User | Drinking water | Consumption/quantity Infrastructure leakages |
| | Waste water | Contamination |
| Industry | Processing | High consumption Wastewater contamination |
| Hydro-electric | Power | Dams Change in natural flows Sedimentation |



Who needs to be convinced?

Once you have selected the goal of your valuation and prioritized the users and uses, the process of persuading these groups to take the desired action needs to be developed. In this phase we talk about who are the **audiences**. For any set of users, there are likely to be various audiences who will be instrumental in bringing about change.

Table 3 shows examples of users and their associated audiences.

| Users | Audiences |
|---------------------------------|--|
| Domestic Users of Potable Water | Consumers Mayor Regional Government Water Utility |
| Agriculture | Individual producers/farmers Co-operative Agricultural union |
| Hydro-electric power | Electric Utility Governmental Regulatory Agency |

In choosing between sites for a valuation study, the site selection should consider the conservation organization's **relationship with the key audiences**. Remember, we already identified a goal for our valuation as the first step in the WVM. **Meeting that goal is the cornerstone of your whole project.** You might have the best site from a biodiversity perspective and even users that should have the means to take the desired action, but without the **support of the key stakeholders and audiences** the probability of success diminishes.



Every case will have different audiences who are key players in the decision making process. Obviously, some of these stakeholders will have more influence than others. You may want to prioritize these stakeholders and begin exploratory conversations early in the process to gain their support in bringing in and educating the other stakeholders. Local conditions should guide you on the best approach to gain stakeholder acceptance; but no matter what approach is used, it is essential that **all stakeholders become a part of the consensus building process.**

What Information Do You Need?

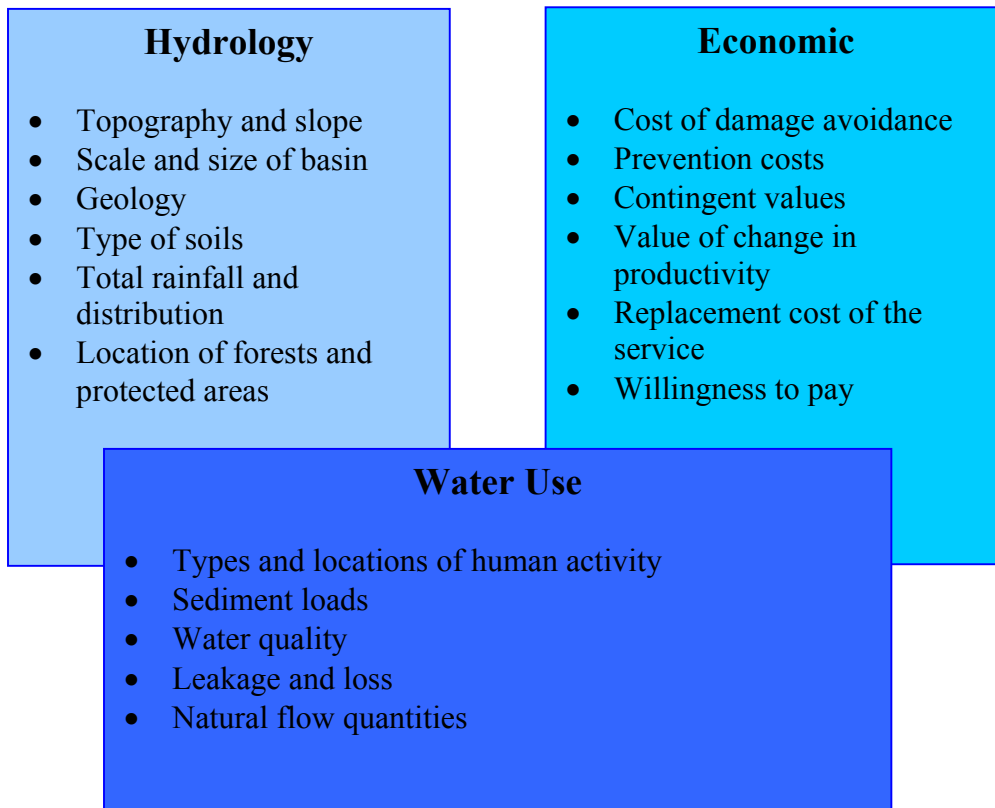


Often, the best way to persuade someone is in relation to their “pocketbook”. Contrast this with the historical perception that water is abundant and should have little or no cost to the consumer. It quickly becomes clear that it is necessary to “prove” that water has a value and that specific actions are required to insure its quality and quantity.

When trying to convince someone to “take action”, it is usually necessary for that person to understand how they will **directly benefit** from such an action or have some other sort of incentive.

Identifying the types of information necessary to convince your audience determines the **scope of your valuation study**.

Typically a valuation study will have various inter-related factors: hydrology; water use; economics. If the legal framework is unknown then a feasibility and options study will also need to be conducted. Some of the factors that may be considered in designing the scope of the studies are shown below. Those used from each category will be identified through working with stakeholders and advisors.



Remember, your valuation study should be focused on finding the information needed that will persuade your targeted audiences to take those actions necessary to meet your defined goals.

For example, if your target audience is an electric utility, and you want to prove the importance of reduced sediment in the operation of their turbines; your study does not need to put a lot of effort monitoring the level of health risk contaminants. However, if the example is an audience chosen in relation to drinking water, the level of toxic pesticide runoff becomes an important factor in the study. Getting the focus right results in a much more cost-effective study.



Throughout the process **“the message” should be targeted to the audience** you want to convince, in terms they will understand, and with objectives that will have meaning to them; while of course meeting your own outlined goals.

In carrying out this Water Valuation Methodology a series of steps are taken to define the scope needed for a valuation project. While some may have the luxury of time and resources to conduct a comprehensive valuation study of a watershed, the WVM provides a tool to focus resources to meet a defined goal.

1. Choose your conservation sites.
2. Identify goals of watershed valuation.
3. List water users
4. Prioritize water users to meet goals.
5. Identify key “audiences” and stakeholders.
6. Define scope of valuation project/study.
7. Conduct valuation study
8. Craft your message.

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