

DEFINING PROPERTY RIGHTS FOR WATER MARKETING

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1 INTRODUCTION

Today, many countries in the world have a need to reallocate water between existing uses. Four reasons can be given for why reallocation is occurring and why it will increase in the future. First, in many places water shortages and expanding uses mean the supply of water is far short of the demand. Second, water needs to be put to more efficient uses from both an economic and conservation perspective. Third, reallocation is needed because the global community is placing new and different values on the way water is used. In the past some water allocation systems were designed to completely allocate water for consumptive uses such irrigation, industry, and urban water supplies. Today, the goal is sustainable development. Fourth, changing environmental conditions can modify the volume of water available for allocation. Temporary conditions, like drought, or the potential for global climate change means we need to rethink existing allocation systems. All these reasons point to the need for a better system of property rights in order to facilitate reallocation.

Property rights systems for water should be designed to accomplish four purposes. First, the property right needs to define the uses that may be made of water. Clearly defined “use” rights are the core of a water right. Second, because water is mobile, use must be shared. The water right must not only define the uses allowed, but the right must define the relationships that each “user” and each use, human or environmental, has with the other “users” and uses in the system. Because property rights define relationships, some “rights” are in fact “obligations” to do or refrain from doing something. Third, property rights systems should be designed to reduce conflicts between right holders. However, with water rights, multiple uses often exist for the same water either simultaneously or sequentially, increasing the potential for conflicts between users. The goal of reducing conflicts is difficult to achieve when the right is shared and not exclusive as it is with some other property rights. Fourth, all property rights systems need to be adaptable and therefore require mechanisms for reallocation. Although many different mechanisms for reallocation can be used, our focus here is market reallocation. Markets can be an efficient mechanism for reallocating water, but many water rights systems are poorly designed for that purpose (Howe et al. 1986). In order to develop a simple and efficient system for water marketing, certain obstacles must be overcome. Although these obstacles are discussed in terms of market reallocation, the same problems must be overcome if reallocation is through administrative, legislative, or other means.

2 OBSTACLES TO OVERCOME

Designing a property rights system for naturally mobile resources, like water, can be a difficult task. If water stayed in one place like land, it would not be so problematic. As water passes through the hydrologic cycle, the same molecule potentially may be put to a succession of uses, by different users, who are in different political jurisdictions each with a different system of property rights. By using water, people interfere with its natural movement through the hydrologic cycle and can change the availability of water to another user or the environment. Water mobility means multiple users and also the environment must “share” the water in some way. An “exclusive” right to water’s use is impossible if the environmental uses to which water is put are recognized as rights. The major obstacles to achieving the goals of a water rights

system are lack of exclusivity, failure to integrate, poor adaptability, and lack of enforcement or enforceability.

Water's mobility makes it more difficult to create exclusive uses than with land. Part of the problem relates to the inability to draw a fixed boundary around water. With a known boundary, excluding those who have no right of use or occupancy is easier. Legal descriptions of land fix the property boundary in space and give "ownership" to a distinct parcel. Land ownership generally means a degree of exclusivity in its use. Land that is subject to universal use can lead to overuse and the "tragedy of the commons" (Yandle and Morriss 2001). One reason "ownership" systems are developed is to prevent overuse by creating a degree of exclusivity in the way the property is used. Because water is not fixed in place and is always shared in some way, it cannot be "owned" in the way land is owned (Matthews 1991).

Mobility within the hydrologic cycle means that a system of property rights must recognize the shared nature of the resource rather than defining it in terms of exclusivity. Water use should not be looked on as an exclusive process even though some exclusive uses of water can be made. As water moves through the hydrologic cycle a series of water rights may be exercised sequentially over time and space. For example, river water can be used for domestic purposes in a city and at a later time the effluent returned to the river can be used for irrigation. Water rights can also be exercised simultaneously with more than one party having a right to use the same water at the same time. Thus, a fisherman may have a right to fish in a river while commercial navigation is occurring in the same water. Because water rights can be exercised both simultaneously and sequentially in the same water, any change in use can have the potential for affecting another user. This is called third party effects or externalities, and it impacts both human and environmental uses within the system (Gould 1988). Water rights systems must overcome concepts of exclusivity and include ways of coping with third party effects.

Because the hydrologic cycle is integrated with both land and the atmosphere, a water right must be defined in ways that recognize the connectivity between different parts of the cycle (Matthews et al. 2001). Changing water use in one part of the system can have an impact on another part of the system. Thus, integration, like exclusivity, has a direct bearing on third party effects. Integration is important because water in one part of the hydrologic cycle may have "water rights" attached to it but not water in other parts of the hydrologic cycle. Integration is also important from a management and jurisdictional perspective.

In what part of the hydrologic cycle can water rights be established? Atmospheric water, diffused surface water (surface run-off), and soil moisture create problems in defining water rights. For example, water in some parts of the hydrologic cycle may be considered "land" and not separable from it (soil moisture). Water in other parts of the hydrologic cycle, atmospheric moisture, may be entirely outside any property rights system. In addition, some legal systems do not recognize a water right as a right separable from land rights. Thus, a landowner also owns the water associated with the land. For example, in the United States the ground water doctrines of absolute ownership or reasonable use create rights connected to the overlying land. A system like this fails to recognize the integrated nature of water uses and can result in situations where third party effects are ignored. Tying water rights to land ownership also makes reallocation difficult for uses not associated with the land.

Different aspects of water management are not always integrated. In managing water, allocation laws are frequently separate from water quality laws, and watershed management is separated from water allocation. For example, creating different agencies to regulate and monitor water quality and quantity ignores the fact that quantity and quality are directly related. Land management (watershed management) also needs to be integrated with water management (Tarlock 2000). If a landowner plants corn on land that has been used for pasture, the amount of water entering a stream draining the land, could be reduced. Changes in land use can have

considerable third party effects when land management is disconnected from water management. The idea of managing the entirety of a watershed is a popular notion, but most water rights systems are not designed to do this.

Integration must also be considered from a jurisdictional perspective. Water, as it moves through the hydrologic cycle, inevitably crosses political boundaries. Even when the boundaries are within a single state, management is not always integrated (Getches 2001). Here again management systems must examine the sequential and simultaneous nature of jurisdictional conflicts. For example, within federal systems conflicts can occur because simultaneous jurisdiction is exercised by the central government and its constituent parts. The subdivisions within a federal state may also have conflicts because jurisdiction is exercised sequentially in the same ways that upstream and downstream states exercise jurisdiction under international law. Integrated water rights systems are not always possible to achieve under these circumstances, but designing a property rights system that completely fails to recognize other jurisdictions will only lead to problems.

Water allocation systems must also be adaptable to changing circumstances and therefore require a method for reallocation. Property rights systems must be able to change in order to reflect changing societal preferences. Reallocation can occur through the use of markets or through legislative or administrative processes. All these methods require property rights to be clearly defined and require an efficient exchange mechanism. Markets can fulfill the need for adaptability but certainty and clarity in property rights is a prerequisite.

Even if a water right rises to a level that is a legally enforceable right, it does not mean that it will be enforced, and it may not be enforceable. Enforcement is a matter of human will while enforceability means other factors, such as physical impossibility, can prevent enforcement. For example, “environmental” water rights may not be enforced by administrative agencies because they are unpopular with the governing body. Enforcement may require lengthy, expensive litigation to compel performance which private parties are unwilling to under go. Other “rights” may not be enforceable for a variety of reasons including lack of clarity in definition or insufficient budget. Enforceability may also be impossible because a conflicting right has a preference or because of circumstances in the natural environment. For example, enforcement could require monitoring, and if no monitoring devices are installed, enforceability is impossible. Enforcement requires clearly defined property rights.

As mentioned in the introduction, the purpose of a water rights system is to clearly define the uses that may be made for water and the relationships that exist between the different users and uses. Reducing conflicts and adaptability under changing circumstances are also goals. The obstacles discussed above make it difficult to achieve these goals. However, property rights systems can be designed to overcome these obstacles. The two underlying themes for overcoming the above obstacles center around clarity or certainty in rights and clearly defined third party effects. The following sections address the types of property rights possible then turn to the questions that need to be answered to have a clear and certain property right. Included in this is a discussion of third party effects.

3 TYPES OF WATER RIGHTS

Because of water’s mobile nature, multiple users tend to have rights in the same water with the rights sometimes being exercised in a spatial and temporal sequence and at other times the rights are exercised simultaneously. Understanding the nature of water rights is critical for water markets or other forms of water reallocation. The categories discussed below include the following types of rights: government rights, public rights, rights/obligations created by

regulation, private rights, and private rights created as an incident of property ownership. Not all of these rights are subject to reallocation or markets, but they must be understood because they are a source of conflicts.

Government rights are held by government entities. The rights come about in two basic ways. Governments, like private individuals, may establish a water right under the normal laws controlling water allocation. In the US, for example, an irrigation district or a city may be required to follow the state law in order to obtain a water right. The rights created in this way are like private rights and have no special status. The right is held in the name of the “government” rather than a private party. Under some circumstances these rights may be available for sale. The second kind of right is a result of government ownership in a proprietary sense. The government may be the complete arbiter and controller of water, or the government may act as a licensing or leasing agent that grants rights to users. The rights granted may or may not be marketable. In some countries state control is absolute, and a permit to use water is not transferable. Unless a mechanism for transferring rights is established, this kind of government right is not marketable.

Two types of public rights have been identified. One allows individual members of the public to use water in specified ways. This right is held in common with all other people, and at least historically it was free and unregulated, which in some instances led to the tragedy of the commons. Common rights are traditionally outside the market because they were free and open for all to use. These common rights can be redefined through regulatory processes. If the regulatory process establishes a permit system, then a market for the permits could be developed. The second type of public right obligates the government to do certain things to protect the “public” from harm. The public’s right to a sustainable future, where this exists, creates a government obligation to protect the public’s interest. This second type of common right is generally very limited and may require judicial enforcement or legislative recognition. Often regulations are required to protect this public right because property rights systems did not historically do so.

Regulatory rights and obligations controlling water use, have evolved to resolve problems related to overuse of the commons or to resolve conflicts between competing uses. In addition, regulatory rights are designed to satisfy public expectations by providing a regulatory structure to solve a perceived problem such as the protection of water quality. Regulatory rights can exist at many levels of government. Irrigation districts may have rules on how water is to be rotated between the different users in the district. Local governments may pass land use laws that effect water quality or control recreational access to water. Regulatory rights may only be enforceable by an administrative agency, or they may require a permit for uses that directly or indirectly impact water. When permit rights are designed to be marketable they become private rights as discussed below. Many regulatory permit systems can be designed to incorporate market elements.

Private water rights are sometimes marketable and generally operate within a regulatory structure. In the regulatory process, permits or licenses give individuals a right to use water in certain ways. The permits/licenses can be considered a contractual right and may be personal property or may rise to the level of property under real estate laws. If properly designed, the permits/licenses can be marketable. Generally such sales require some kind of government agency approval. Market systems can be designed for many kinds of water uses such as white water rafting permits, sewage or salinity discharge permits, and endangered species taking permits. Although these marketable rights are theoretically possible, they have not been developed as a general rule. Even where the sale of a water allocation right is possible, sales

should take into account third party effects—the potential injury to other water users. If third party effects are completely limited, only the amount of water historically consumed should be available for sale. Unfortunately this volume is not usually specified as part of the water right. Determining this volume can add substantial transaction costs to a sale.

Other water rights exist as an incident of land ownership. This category is very diverse, and in the US many of these rights have their origins as an extension of common law land rights (Morris 2001). By defining the water right as part of the land, legal protections that existed for land could be extended to water. These rights can be held by individuals or by groups of individuals. The most obvious is the riparian rights system that evolved in the eastern US. The common law also created “land” rights in ground water. Of similar common law origin are tort laws designed to protect the property interests of a landowner. The doctrines of trespass, nuisance, negligence, and subjacent support have been used to protect property owners from the actions of others who might harm their property through flooding, draining ponds, creating subsidence from pumping ground water, or modifying water quality. Generally water rights created as an incidence of land ownership cannot be separated from the land. Reallocation in such circumstances is not always feasible.

The nature of these different water rights is dynamic and frequently overlapping. An example may be helpful. A river flows through the mountains in an eastern US state. A riparian landowner has a riparian right to the water flowing in front of her property. This is a private property right based on ownership of the adjacent land and is held in common with all the other riparian landowners. The river is classified as a “wild” river under the federal Wild and Scenic Rivers Act. The act regulates some but not all uses on the river. The river is popular with white water rafters who initially float the river without permits. This recreational use would be a public right held in common by all people. In time, use becomes so heavy that restrictions are placed on entry and exit points for floating the river. The restriction is a form of regulation in the public interest. As use further increases, individual and commercial permits are required with the maximum number issued being limited. In time, with heavy use, a market develops for the sale of permits because this is the only way the river can be floated. The common right of free use has thus become a private salable right created by permit with regulatory obligations imposed for entry and exit. At the same time the riparian right remains in place and other uses are partially controlled by the Wild and Scenic Rivers Act.

Not all water rights are marketable as is seen from the discussion above. Even when the right is marketable, obstacles must be overcome before an efficient market is developed. The obstacles can best be overcome by creating certainty and clarity in the uses allowed and in the relationship between users.

4 CERTAINTY AND OVERCOMING THE OBSTACLES

Certainty is a critical element in the viability of a water market. Certainty is needed in order to know exactly what is being reallocated and in order to determine how the reallocation impacts other rights. If the other rights are unclear, the risks go up for having a failed transaction. Lack of clarity or certainty occurs in all five types of rights discussed in the preceding section. Rights that are created by permit rely on the terms of the permit or at times, the enabling legislation or regulations that set up the permit system. Rights created by common law or legislation often have broad standards allowing flexible interpretation. The standards used are sometimes open-ended and include words that sound nice as a matter of policy but are subject to extremes of

individual interpretation. Words like reasonable, beneficial, and public interest are frequently used in defining rights, but not everyone would agree on their meaning. In some systems, permits may exist which define in some detail the nature of the uses allowed. Unfortunately permits are often very cursory and are missing important elements. Permits may completely ignore obligations that are part of the right, or they may ignore potential third party effects. Permits are often issued without considering the need for integrated management or jurisdictional integration. Although rights and obligations may be spelled out, they may not be enforced or they may not be enforceable.

Uncertainty comes up in many areas critical to water markets. How the following questions are answered will determine the nature of the property rights structure and will control the reallocation process. To what water can a right be attached? What uses are allowed, or what water use is being protected? Are there restrictions on where the water can be used? Is the volume of water limited, and how is volume measured? What is the probability (level of security) of the right holder actually receiving water? How secure is the entitlement to water? Does the permit or regulations clearly state what the operational terms are? Are the rights of others clearly defined and known? Are simple methods for determining third party effects in place? Does the market developed allow equitable and efficient reallocation of water and water rights?

The fundamental question of what water is or can be covered by a right should not create problems, but it does. This is a jurisdictional issue. If a statute or doctrine is limited to “navigable waters” or some other water definition, what water is jurisdiction actually being asserted over? What is the line between water that is part of the land and water that is controlled by allocation law? What happens when the water subject to the right, has hydrologic connections with other water with other attached rights?

The second question relates to the “use” of water or the level of “protection” the water is entitled to receive. For example, at US common law a variety of standards evolved to control water use or to protect landowners from harm. The standards used were designed to be flexible and considered other uses of the water. Many of these common law standards are still in use and some have been incorporated in statutes. In the US the majority of the states in the East adopted a standard of “reasonable use” for the allocation of water and for the maintenance of water quality. Reasonable use is a situational concept that requires an evaluation of other uses in the system. The uses allowed and the volumes associated with them can change with time. However, using the concept of reasonableness to define the “use” right creates uncertainty. Other ways of defining the use right, such as through permit systems, can create a greater degree of certainty if the operational criteria are spelled out in the permit.

Intimately related to the uncertainty in defining the type of use is determining the volume of water that is associated with the use. How much water is needed for a “reasonable” or “beneficial” use? How much water does an endangered minnow need? How much water is needed to irrigate the practicably irrigable acres on an Indian reservation? Uncertainty in volume plays a significant role in conflicts. Sometimes the uncertainty is a result of being unable to determine scientifically how much water is needed for a given use. At other times the right itself is poorly defined creating uncertainty. Two kinds of problems are found with this: 1. Language creating the right is “flexible” or subject to interpretation, 2. The volume is not measured in a way that allows easy reallocation. The first stems from the lack of clearly defined uses as discussed in the prior paragraph. The second volumetric issue relates to when, how, and where a water right is measured. For example, in western US states and Australia the water right is generally measured at the point of diversion. This is a simple measurement and historically made sense. However, the volume diverted is not the volume that can be sold if third party effects are considered. All that can be sold is the consumptive volume, and that volume is not defined by the water right if it is based on a diversionary amount.

Some water rights systems place limitations on where water can be used. These limitations can have serious implications for where water can be marketed. For example, use may be limited to riparian land adjacent to the water source or to use within a watershed. Other limitations would allow use only within a political unit. Limitations on place of use restrict the size of the potential market and may result in market failure.

In places where the supply of water is reliable the issue of security of delivery may not be important. If the supply is highly variable, delivery may not be possible in all years or the volume delivered may be reduced. Different mechanisms can be developed for controlling what is actually received. Two main mechanisms exist for this—preference structures and sharing mechanisms. In some cases both may be incorporated.

Preference structures usually define categories of uses or users and in times of shortages these preferred uses receive water and others do not. If water is plentiful all may be satisfied, but in times of shortage only those with a preference receive water. In the western US, a temporal preference system is used. Systems of shared use can also be developed. For example, some irrigation districts share whatever water is due them equally among all the irrigators in the district. The security of delivery will influence what uses are made of water and the value of the water in a market transaction.

Security of entitlement has two aspects. One is the length of the term of the right whether it is permanent, for a limited term of years, or is renewable after a term of years. The second aspect is under what circumstances can the right be lost or terminated? Security of entitlement influences a property right's marketability. The length of the term is an important aspect. Permanent rights have an indefinite lifetime unless something is done to extinguish the right. Other rights may be for a term of years with virtual automatic renewal. These are similar in affect to permanent rights. Some rights may be less secure because there is a periodic review with the potential for modification or termination. The term of the right as well as the conditions for the loss of the right should be clear but are not always. Loss of a right can occur through operation of the rules defining the right or because a new right is asserted that is superior in some way. A right may be lost for failure to use the water or because water is wasted. Rights may also be suspended or terminated under certain specified conditions such as drought.

Operational rules included in regulations and permits/licenses are an essential part of determining how water is to be used. Rights that are controlled by permits/licenses have the potential for a greater degree of certainty, but this requires that all the elements needed to define the right are present and clearly defined. Items not included in a permit must be included by regulation. If the water right associated with the permit is to be marketed then the permit and associated regulations need to include some very specific things. Generally, these include the point of diversion, place of use, type of use, volume to be diverted, and time of delivery. They might also include the point of return flow. These elements are appropriate for controlling how water is used in a very general way, but they could be expanded to include type of delivery ditch, method of irrigation allowed, and other site-specific irrigation criteria. The permit should also include the consumptive amount that will result from these operational criteria.

Determining the rights of others within a system is not always easy. As discussed above, water rights can be government rights, private rights, regulatory rights or other rights. Although many of these rights are not marketable, they have an influence on the value of marketable rights. As a minimum, the private property rights subject to markets must be defined. The definition should include a system for registering all private rights. One system suggested for registering rights would be modeled after the Torrens system of land titles (Young and McColl 2002). This would create a public registry of all private rights available for reallocation. Ideally the registry would also include all types of water rights. Only by knowing all the potential rights associated with a particular bit of water can conflicts be avoided.

A simple method for determining the volume of water needed to alleviate third party effects is also needed. These third party effects are almost inevitable in reallocation because in some sense water is always shared to a degree with complete exclusivity being difficult to obtain. Third party effects include harm to the public interest and to other right holders in the system. Before a water right is sold or transferred these third party effects should be determined. However if only the consumptive amount is allowed to be sold, almost all third party effects can be avoided. The consumptive amount is that volume taken out of the system by the existing use. If only that amount is traded or transferred there will not be any effect on the third parties beyond what is already being impacted. Measuring consumptive amount on a case-by-case basis as is done in the western US, is a time consuming, inefficient, mistake that adds greatly to transaction costs of market processes. However, simpler methods could be developed based on percentages or other methods. These would be applied uniformly to all property owners. Although this system would have minor impacts on specific third parties, overall the impacts would equalize. Differences in impacts on individuals would be no more than the differences from other regulations affecting property.

The property rights system must also create a market that allows for an equitable and efficient reallocation. Many ways of doing this are addressed in the paragraphs above. However, integrating water reallocation with other resource management decisions and other political jurisdictions is a critical element in achieving equity and efficiency. Ground water and surface water cannot be treated as if they were two separate unattached commodities. Water quality and quantity are part of an integrated whole. Land use or watershed planning must be integrated with water planning. The needs of other jurisdictions must be considered and incorporated into the process. Failure to integrate these management processes can lead to inequities and conflicts that can complicate the reallocation process. Conflicts reduce the efficiency of market processes. Conflicts can be reduced by integrating regional resource planning, incorporating jurisdictional considerations into planning, and developing a single agency capable of approving water reallocations. The single agency would be responsible for insuring the process is integrated and third party effects are adequately considered.

5 CONCLUSION

The questions addressed in the preceding section are central in formulating a water rights system that will allow marketing water rights. The system that exists in the US is a flawed one and could be improved in many ways. The major changes would include the following ideas. Water rights should not be based on a diversionary entitlement but should instead be based on a consumptive use entitlement. This entitlement should be standardized to simplify transactions. These standards would then be applied to each water right as part of a programmatic endeavor. A registry of water rights also need to be developed that would include not only private rights but also all other water rights. Rights not on the registry would not have to be considered in a market transaction. An integrated planning process also needs to be initiated so the full impacts of reallocation transactions and other decisions are incorporated into a single planning process. In addition, multiple jurisdictions must be incorporated into the planning process. Although the suggestions in the conclusion are aimed specifically at the US, the questions addressed above have a degree of universality. Other places in the world can gain insights into what is required for a property rights system designed to encourage marketing.

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