



TWV Podcast #009:
The Economics of Water with David Zetland, Ph.D.
Show Notes at <http://thewatervalues.com/pod9>

Intro: Welcome to The Water Values Podcast. This is the podcast dedicated to water utilities, resources, treatment, reuse, and all things water. Now here's your host, Dave McGimpsey.

Dave M: Hello and welcome to another session of The Water Values Podcast! Thanks for joining me.

Today we're talking with David Zetland, an economist focusing on water issues. This goes back to my roots a little, since I was an Economics major in college. David fills us in on a lot of important economic concepts that relate to how we think about water and how we value water. He provides a very interesting discussion. I'm sure you'll enjoy it.

The published portion of the interview is about 37 minutes, so I'll minimize the introductory talk, so we can get right into it. But I still need to provide the disclaimer that this podcast does not establish an attorney-client relationship with you or anyone else, and information in this podcast should not be considered legal advice. Further, this podcast is not a solicitation for professional employment. I'm just a lawyer who finds water issues interesting and who believes greater public education about water issues is necessary. And that includes enhancing my own education about water issues because no one knows everything about water.

With that said, let's get on with it. Open the valves, fasten your seatbelts, and here we go.

Dave M: Well, Professor Zetland, thanks very much for coming onto The Water Values Podcast, greatly appreciate your time. Do you mind if I call you Dave or David?

Dave Z: Sure. Either way is fine. No problem.

Dave M: Terrific. Well, to start off with Dave, why don't you tell us a little about your background and how you got interested in water.

Dave Z: Ok, great. I was born and raised in California, and I hadn't, I wasn't very interested in water let's say, except as a consumer. But I went, in my twenties, I went traveling for five years, and went to over sixty countries and saw a lot of different ways of living life, let's say. I came back to the Bay Area in the middle of the Dot.com boom and after a while, decided I wanted to go to graduate school instead of becoming a tech millionaire.



And I went to U.C. Davis to do a Ph.D. in development economics because I wanted to find out what made countries develop and so on. And the topic I chose for my dissertation was going to be drug cultivation in South America. And my advisors were a little bit worried that I wouldn't survive my research phase. And I agreed with them because that was kind of a silly idea.

But, in just passing time with the professor, I started talking to him about what ended up being the topic in my dissertation, and the title of the dissertation is called Conflict and Cooperation Inside of an Organization. And it was a case study of the Metropolitan Water District of Southern California. And most people don't know this, but it is one of the larger utilities in the United States. And what I found to be really fascinating about Metropolitan was that it was a co-op, but the members of the co-op, which include Los Angeles, and San Diego and Beverly Hills, a lot of well-known communities. Those members were all fighting with each other, which is why the name has Conflict in the title.

And as I got into this area of water management, I started to see a whole bunch of parallels between water management failure and essentially what developing countries can't do, which is they can't overcome various problems with serving citizens. They have interest groups and they have misallocated resources, and they have subsidies, and all kinds of things that are – we think of as being problems in developing countries and kind of the reason that people are poor. A lot of those same reasons and patterns show up in water management, not just in those developing countries, but also in the United States and many other countries. So I've been doing water economics for about a decade now, and I've been drawing on this background of development, which is why do people do their job and how can we as a community manage our water?

Dave M: Ok. You mentioned patterns in water management. What are some of those patterns that you notice?

Dave Z: The most significant ones are that most water is managed by a monopoly, or various monopolies, so your tap water comes to you from your water utility, which is a monopoly. Farmers get irrigation water usually from an irrigation district or a water distribution organization that's also a monopoly. And you can go down the list.

And so a lot of the ways that water is managed is through this monopolistic structure. And that's not a problem when the monopolist is working on behalf of the community to make sure that everything is done efficiently, whether it's bringing tap water to your faucet or making sure that the right farmers get the water when there's a shortage of water. But it can be a real problem if the monopolist either is misguided in terms of following some set of guidelines that don't serve the community or actually even corrupt, and the monopolist is doing whatever it wants to without regard to what's good for the community. That's one feature which is very significant.



Another one is that water issues are very local. Unlike other utilities, like telephones for example, which can be nationwide in terms of utility networks or energy which is a resource but also utility space which has a lot of connections with trade around the world, water is a very local commodity or it's a very local community good, and therefore, it's important that regions manage their water and if they do, then they can be self-sufficient and happy and not necessarily worry about failure next door. But if they fail, they may not be bailed by people next door.

Another pattern which I spend a huge amount of time as an economist telling people about is the difference between the value of water, the price of water, and the cost of water. And the cost is the cost of delivering water to your tap or to a farmer's field. It's the cost of pumping, the cost of infrastructure, the cost of personnel, chemicals, and all those kinds of costs. And the price of water, generally speaking, is targeted at recovering those costs.

But that price and the price of water is often significantly lower than the value of water. The value of water is, of course, what we are willing to pay for it, and I'm willing to pay a whole bunch of money for a glass of water if I'm thirsty, right? I am also willing to pay to water my lawn. I don't have a lawn, but if I had a lawn, to water my lawn. I'd be willing to pay for washing the dishes and so on. So that's the value.

And water, more or less, for most household people, residential users of water, water is a tremendous deal. We pay in the U.S. an average of about one or two dollars for two hundred and fifty gallons of water and that's roughly one thousand times, so bottled water is roughly one thousand times higher than that. So we are getting a pretty good deal on most water.

The problem shows up from an economic and an environmental perspective when, not because that water is cheap, but because the price of water may not include some costs that are relevant. And the one I talk about all the time is the cost of scarcity. So, generally speaking in the industry, the cost recovery does not include any cost or value for water, the water itself. The water is kind of free.

And by that I mean you have a utility. They'll pump groundwater out of the ground, and put it in pipes and treat it, and bring it to your tap. You'll pay for the pumping, you'll pay for the pipes, you'll pay for the treatment, you'll pay for the treatment plant, you'll pay for the guy that comes and reads your meter, but you won't pay for that raw groundwater.

And that's not a big deal if there is abundant water, and basically you can use as much as you want as long as you pay the price. But it is a big deal if there is not a lot of water and you're willing to pay the price, but the utility might run out of water at that price. What it means is that the water is too cheap and the price is too low, and the price has to rise to get people to use less water. And that's me as an economist.



This is a very difficult concept to bring into the water sector for people who are not – they are usually trained as engineers, they’re not trained as economists.

Dave M: Well that’s a good segue to talk about rates a little bit. Rates are often set on a cost basis according to state statutes, and it can be very difficult under those cost-based statutes, or cost-based rate statutes, to get conservation rates approved because, really, the marginal cost of the next gallon of water is almost always less than the cost of the previous gallon. And so that kind of fosters declining block rates. But that leaves an externality, or something that’s not taken into account, which is what I think you’ve talked about, about the cost of scarcity. Could you talk a little about the different mechanisms for pricing the water that utilities sell?

Dave Z: There’s a couple ways of charging for water, and we’re talking again about drinking water. We’re not talking about bulk water for farmers and so on. Or frackers, for that matter.

But, for residential water, usually your bill, the first bills that came out were fixed. It was part of your property taxes. And some people still pay for water as part of their property taxes. They have no water meter. They use as much water and they flush the toilet, and they produce as much wastewater as they want, but they pay a fixed charge. And those systems are obviously easy to administer and they don’t provide any conservation incentives, but they are reasonable when there’s a lot of water around. Because all you really need to do is make sure you pay the cost of running the system.

Then comes the idea that we should charge for the volume of water people use, either because we want people to pay in proportion to how much they use, which makes sense for, you know, if you want to discriminate between commercial water users and residential users, or heavy users and light users, or because you want conservation. You want to say, look, every unit of water you use is going to cost you something, so you should think more about it. You don’t just turn on the tap and leave the house for a week.

And when you get into that pricing method, you have some fixed charges, which are every month no matter how much water you use, so that’s similar to the old system. But now you have a volumetric charge which depends on how much water you use. And there’s three different ways of doing volumetric charges. The obvious one is what’s called a uniform rate, which means you pay the same amount per unit of water, no matter how many units of water you use. So, say that, you know, I was using this, we’ll use a unit of a thousand gallons, so your first thousand gallons is \$2.00, your second thousand gallons is \$2.00, and so on. This is very similar to pricing gasoline or any other commodity we use per unit.

Another idea, which is what you talked about, is called decreasing block rates, which means the more water you use, the less you pay per unit. So you pay \$2.00 for the first thousand gallons, and you pay \$1.50 for the next thousand gallons, and \$1.00 for the next thousand gallons. And



this system was put in place in a lot of areas where economists had an influence, saying you want to match pricing to costs. And the pricing should be lower if you use more because your fixed costs are spread over a larger volume. The thing's that's crazy, of course, is that you have a fixed charge that can complicate that thing. So, the decreasing block rates, let's say it this way, are an old way of charging for water, definitely used in some places, not considered to be a best practice anymore.

And there's a lot of reasons for that. The biggest one is it encourages people to use more water, which no one, anywhere, actually thinks is a great idea. So that's kind of going by the wayside.

Another way of charging is the opposite. It's increasing block rates, which means you pay \$2.00 for a unit of water, you pay \$2.50 for the next thousand gallons of water, you pay \$3.00 for the next thousand gallons of water. Increasing block rates are meant to do two things. They are meant to reflect increasing costs, which is the opposite of what we just talked about. So the systems obviously vary. But also, they're trying to give people some stronger conservation signal along the lines of a thousand gallons is ok, but two thousand gallons is too much. You should really pay more.

And the thing that's curious about increasing block rates is that they are used in water, but they're not really used in almost any other sector and the only place where they're close to being used is like in mobile phones. If you go over your minutes, you pay a penalty price or in electrical utilities, they might have, or energy utilities might have charges that go up in the middle of the day because it's more expensive to provide energy, and so on. And all these different rates, what they're meant to do is they are trying to recover costs and change behavior.

And I've thought about this a long time, and I used to be a big fan of increasing block rates. I used to have a bumper sticker that said "some for free and pay for more," which I considered to be the reconciliation of communism and capitalism. But I feel like increasing block rates are actually not only too complicated for consumers to understand, because you don't usually know when you are in a different block, but they are also very difficult to design correctly to get that cost recovery target and they don't necessarily do a good job at helping people conserve water.

Dave M: Well, let's talk about price as a signal. How can we get price to better signal to end users the true value of water? What kind of mechanisms do you recommend we adopt?

Dave Z: Well, I want to be careful about using the words "true value of water" because those values are different for you and they're different for me.

Dave M: Fair enough.



Dave Z: And I want to draw an analogy with the true value of iPhones, let's say. And, if I go to an Apple store and I say, hey, this is \$450 for an iPhone, I'll pay that, then the only thing you know as an outside observer is that that must be worth more than \$450 to me. And that's true with almost everything that we buy in an open market. Including, it could be including water. Like, I'll pay a hundred dollars for a liter of water when I'm in the middle of the Sahara Desert because that's better than dying, right?

So values are, they vary from person to person and they also vary with circumstances. And what we want to do with water is we want to make sure that, on the one hand, when it comes to utilities, public utilities, that there's enough water for everyone's uses, but also that we don't run out of water. And what that means is we have to have some kind of rationing when water is scarce. If water is abundant, you can sell as much as you want. And up in Vancouver, a lot of people in Vancouver are not even metered. Vancouver has a tremendous amount of water, so there's not necessarily a water shortage problem.

But when it comes to, when you're coming to places where water scarcity is discussed, or water shortage, or a conflict, or crisis – all of these words that people use – in those cases you want to use some rationing method with water. And as an economist I talk, I think that the best rationing method is pricing. Other rationing methods are much more complicated. You need to, for example, say that every person in the house is going to get 20 gallons or 50 gallons free or cheap, before the price starts kicking in. Well that, in the United States, that's not going to happen because Americans don't like having anybody know how many people live in the house. So it makes it difficult to have some kind of fair rationing method when you don't know how many people live there. And so I go back, that's why I come back to this, that's why of course, increasing block rates don't work either because they're not based on the number of people who live in the house.

So I go back to the uniform block rates or I go back to uniform pricing, and I say, ok, we have a hundred units of water and people are using ten units a day. So, we're going to run out in ten days. And we don't want that to happen, so we had better raise the price and let's raise it up so that people are only using eight units of water a day and then we can get, we know we can get more water by the eleventh day, so we can bring more supply. But you can have any example you want, but the main idea is that if we raise the price of water, people will use less of it. And if they use less of it, then that takes off the stress or the pressure on supply and reduces the chance of a shortage.

The next thing people say is, if you raise the price of water, then my children are going to die of dehydration and the rich people are going to buy all of the water. And that's possibly true. But it's more common, I think, to talk about raising the price of water. You in your household might stop watering your lawn or you might do nothing different. But you're probably not going to take water away from your children. And rich people might keep watering their horses or washing



down their Ferraris, but all we care about in terms of raising water prices is what everybody does as a group. And some people will respond and some people won't respond, but as a group will respond by reducing our consumption of water, which will reduce the risk of a shortage and address scarcity. So that's kind of a long way of saying that, if we raise the price of water, we reduce the risk of shortage.

Dave M: You know, one of the things that's gonna underscore the issue of water pricing is that now there is just kind of a set price for water, right? You don't really price water at a specific time. With the advent of advanced metering infrastructure, AMI, it's my sense that utilities are looking into time of use pricing. What's the economists' take on time of use pricing in the water industry?

Dave Z: It doesn't make sense in water, compared to electricity. And that's because with electricity, they have peak demands at, you know, the eleven o'clock to two o'clock period in places where air conditioning is being used, for example. And they have peak demand and they have peak generation capacity, so they switch from, they have their base load power sub-supply, whether it's, you know, nuclear, or hydro, or coal, or natural gas, and then when they have peaking demand, they have to turn on diesel generators, which cost a lot more, for example.

Water is a lot more uniform in terms of good supply. It comes from a reservoir. It might take a couple of days to get to your tap. So it doesn't make a lot of sense to change the daily pricing of water, especially when you can store it. You can store water, like you can't store electricity. So, I think that time of use pricing is never going to show up in water.

But on the other hand, seasonal pricing or scarcity pricing absolutely should show up in water, and the easiest thing to do would be to say, in the summertime, we're going to have prices double in their level because, number one, it's hotter, but we want to discourage your using water for outdoor landscaping, and number two, there's not a lot of water around in the summer compared to the winter, when traditionally it's raining or the reservoirs are full. So I would use that.

And an analogy to that is what they call the summer driving season in the United States for gasoline prices. And industry analysts, they always talk about there will be an increase in demand for the summer driving season, and holding all else equal, we see that the price of gasoline will go up. Well, that's because the price of gasoline is meant to balance supply and demand. And that same method can be used to balance supply and demand for water in the summer season, the summer watering season, so to speak.

And this is a key idea. People talk about water crisis all the time. But, you know, the United States is not unique in the world, but it's pretty far out there in terms of using drinking water on



lawns. And a lot of countries don't even get close to that kind of water consumption. So, on the one hand, I think it's fine for people to have water on their lawns.

On the other hand, I think we should not have a crisis, or even talk about a crisis while lawns are being watered. And, in that sense, if we change policies to keep supply and demand balanced to prevent water shortages, that's generally going to mean that the price of water goes up where water is scarce, and it's going to mean that irrigating your lawn is going to be more expensive where water is scarce, and that's a very important fact that people have to accept. If they think that their lawn is a human right, and they think that it's ok to run down a reservoir to keep their lawn green, then they're probably not going to be doing too well in the future.

Smart meters or water meters that have minute-by-minute feedouts are extremely useful. They're not necessarily useful for peak pricing, like I was talking about, but they're very useful for finding leaks.

Dave M: Oh yeah.

Dave Z: And they can be installed temporarily or permanently, but once you find the leaks, boy, you do quite a bit to reduce water waste.

Dave M: You have a new book out. Could you tell us a little bit about that book?

Dave Z: Right, so *Living with Water Scarcity* is my second book on water policy. The first one's called *The End of Abundance* and both of these books come from very wide-ranging discussions I've had with people over these years at my blog Aguanomics. And, so *Living with Water Scarcity* is the one that I just published last week, and it's a short book, which the most important selling point is "short".

It's a short book that discusses different uses of water and the way that we want to think about not using it, but the policies that affect using the water. And the reason that I have the different uses in there is because all of these uses tend to be interconnected. So if we take water out of the environment and we use it for industry or irrigation, then we have to weigh those tradeoffs.

If we have water that we're using, or we're paying for water at a utility, we need to think about how to price water. If we're having farmers and they have water and they have shortages, it's important to think about groundwater monitoring and water markets and water rights. What about recycling water? What about human rights and water? Water wars and water conflict? There's a chapter for each of these topics, but the chapters are also intermeshed so that you can see how all these different water uses relate to each other. And I've had six years of practice with these topics on my blog and so I'm getting the presentation to the point where the book is only 110 pages.



Dave M: Well, why don't you pick one of those topics or those chapters and tell us, you know, kind of give us a deeper dive on what it's all about.

Dave Z: Yeah, let me just bring up one which is totally coming out of left field for a lot of people, but I think it's a really interesting developing area in water and water scarcity. So the first one is, that I already mentioned in passing with drinking water is, you know, we need to price drinking water to recover the cost of the system and we have to price it for scarcity, and, you know, I go into a whole bunch of discussions of subsidies and how people are subsidizing each other in a very unsustainable way, and I kind of talk about how to remove those subsidies for drinking water.

But then we, people tend to ignore the second half of water's life, let's call it, in your home, which is what happens with wastewater and toilet water, and the water, you know, that goes down the sink. And in the water business, in the industry, the engineers and managers spend a lot of time on this. In fact, usually you spend more than half of your money on wastewater costs, not on drinking water costs, and that's because the wastewater plant that takes all the sewage that comes from houses and from industry and so on in a city, that plant has to clean a whole bunch of different substances out of the water that was never there when they took it originally from the river or from the groundwater. You had to clean all of those substances out in a multi-stage process, and then they usually discharge that water back into the environment, and the groundwater into the ocean.

And wastewater definitely is not sexy. It's an image that people don't want to think about, and there's this expression "toilet to tap," which is the expression for recycling wastewater into drinkable water. And, of course, it's toilet to treatment to tap, so they don't take your toilet water and put it right in the faucet.

But that area of water policy and water technology and operations is becoming really interesting because of two converging trends. The first one is that environmental regulations mean that wastewater discharges have to be cleaner, and cleaner and cleaner. Because in the old days, and you go to developing countries, you see it. They have an outhouse that's literally over the river. And someone goes in the outhouse, does their business, it goes straight in the river and then, you know, kids might be swimming in the river, boats might be going in the river, so there's not very much treatment going on there. They might, people might drain the oil in their car and just pour it in the river. That's how a lot of people still treat water. They treat it as an open sewer.

But in the United States and a lot of other countries, regulations and social norms have changed, and we want to have cleaner discharges so that we don't do, we don't get the environment dirty for our own selves, or for fish, or anything like that that we care about. So wastewater discharges are getting cleaner.



On the other hand, water scarcity is increasing in lots of places and that means that it's more important to find new sources of water. I already talked about reducing demand, but we also can talk about increasing supply. And you can increase supply by taking that treated wastewater, treating it even further so that it's drinkable, and then you can drink it. And that is, the reason this is interesting is because it's cheaper to treat wastewater and bring it up to drinking water quality than it is to do that with desalination – to take saltwater from the ocean.

The other reason this is interesting is because in some ways we've been doing it for a long time, except people don't talk about it, which is when a bunch of cities are on a river. Those cities are taking in drinking water and discharging wastewater in the exact same river. So, when you're downriver from a major city and your city is taking in drinking water, it's dirty, it has to be cleaned – in fact, it's dirty from someone else's old toilet water – it has to be cleaned, and then you drink it all ready. We've been drinking that water for over a hundred years, but now some cities are saying, wait a second, why are we discharging this really clean wastewater where someone else can get it? Why don't we just put it back into our own system and clean it up and put it back in the tap?

Dave M: Right. I agree. I think it's just a matter of getting people to wrap their minds around the hydrologic cycle and what it entails.

Dave Z: Yeah, number one, it's kind of a fact already. Number two, you could say, hey look, you can pay fifty bucks a month for water and we're going to recycle wastewater or you could pay a hundred bucks a month and we'll bring you desalinated water. Which do you prefer? And there's no difference on the laboratory testing of the quality. You can taste, there's no difference in taste, but you're going to pay twice as much. And if you're really so worried about recycled wastewater, then you can pay double. But if you're more worried about money and you don't necessarily think that there's any difference in quality, then let's do that.

Dave M: I agree with you wholeheartedly, but there's gonna, that is going to be revolutionary when we're able to wrap our minds around it.

Dave Z: Yeah. It's something that Americans are not so inclined to do, but you know, in Singapore it's absolutely seen as an obviously good idea. In Israel, it seems a good idea. Australia, it's a good idea. Places that are confronting bigger water scarcity problems and in some ways more realistic discussions in public, those places have embraced water recycling. In the United States, there's still a very large group of people who want to eat their cake and have it. They just do not believe. They believe the Tooth Fairy is going to bring them more water. Honestly. And it's quite astonishing what people are willing to believe despite the facts.



Dave M: So we talked about wastewater reuse and recycling from your book. What are some of the other chapters in the book that you want to discuss?

Dave Z: Oh, I can talk about any of them you want. The first one, so let me go through them one by one, and that will help the readers understand it, but also you can pick out whatever you want. So the one on, the first chapter is, you know, just why are we talking about water scarcity and the difference between scarcity and shortage, and the thing that I bring up in that one is that scarcity is, we deal with scarcity all the time. It's scarcity for real estate, it's scarcity for seating at your favorite restaurant and so on, and we find ways of dealing with it. And that's what the book is about, is finding ways of dealing with water scarcity.

The next chapter goes into drinking water. It's the longest chapter in the book because drinking water is really significant to people. Water pricing is really important. The subsidies that go into water pricing are some of the reasons why we have a lot of urban sprawl, for example.

The next chapter is on drinking water, sorry, wastewater, which I just mentioned. I'm getting the table of contents here because I want to give the right order.

Oh, sorry. The next one is on, it's called Water for Profit, and that's about bottled water, which is not a problem. A lot of people freak out about bottled water, but I just kind of explain why it's not an issue. Also, water for profit. Water for businesses. Businesses shouldn't get subsidized water, for example. For profit versus public or municipal water utilities. Like how they can perform or how they can fail.

Then there's the chapter on recycled water, which I just mentioned to you.

The last chapter in Part One, I'll tell you what Part One is in a second. The last chapter is on food and water, so that's mostly farmers who use about seventy to eighty percent of the water, and how agricultural irrigation works and how markets can help farmers grow food and not need bailouts from the government.

And Part One of the book, so that's Part One, that's the first fifty pages. That Part One is what I call commodity water and it's water as an economic good. And Part Two is all about water as a social good. And this is a really important distinction that almost everybody's aware of, but they don't necessarily discuss it in, let's say, easy to understand terms. And the way I talk about it is that we have a certain amount of water in our country, our society, our community, and we need to divide the water into uses that are communal uses, like the water in a river or a lake that we all enjoy, or we need to, and we have to make decisions in the community that's going to affect all of our water uses, like water infrastructure and so on. And then, once we have taken care of the community, we can take care of ourselves.



So Part Two is about community water. Part One is about commodity water. So Part One is tap water and farmers and water, and so on, but Part Two is a discussion of the social dimension of water. And those chapters are about water and human rights, which is a bigger problem in developing countries because of, mostly because of political corruption. And then, but sorry, I start off that part by talking about the politicians and water managers and the bureaucrats who are running those monopolies or telling those monopolies what to do, and sometimes they succeed in representing us and sometimes they fail because they represent special interests. And it's a significant discussion that everybody should understand.

Then I go into human rights and water, which is not an issue in the U.S. necessarily, because we have plenty of money to pay for water. Infrastructure, which is a very big issue in the United States because infrastructure is destiny in many ways. So if you build a dam or you build a canal, you will have a huge impact on future population patterns.

And then water wars, which is another chapter on how countries might not be cooperating with water use, and that could be, you know, Egypt with the upstream countries, it could be the U.S. and Mexico with the Rio Grande or the Colorado River, it can be the European countries and the Rhine River, and so on.

And then the last chapter is about environmental water, which is really the biggest social use of water because it's a huge volume of water and it affects us all in big ways, especially when we talk about climate change.

Dave M: Ok, well let's take that last one, the environmental water. What is the environmental water that you're talking about and how does it impact all of us?

Dave Z: Well, first of all, the environmental water flows or environmental water, it can be everything. It's the water in the ocean, it's the water that goes by in the lakes, it's the water that, I'm sorry, it goes by in rivers, it's the water in lakes, in some ways it's groundwater that we share because multiple entities are using the groundwater. The biggest dimension of, the biggest factor that's going on there with environmental water is that we all benefit from it, and if someone pollutes it, that one person's action can affect all of us in a detrimental way. If someone takes that water for irrigation, for example, that person's private gain is coming with a social cost and that's just a fact, and so it doesn't mean we shouldn't have irrigation. It doesn't mean we shouldn't have piped water. It just means that we have to have an adult discussion about how much we want to leave in the environment and how much we want to take out for human uses, what I call direct human uses, because the environment gives us indirect benefits.

And the important part of these discussions is that we have to be flexible and say that, you know, fifty years ago we didn't care about the environmental water flows in this river, for example, but maybe today we're changing our mind and we as a community have to decide how to move from



where we are to where we want to be. And it's, I try not to sing Kumbaya in this chapter, but it's really significant that communities cooperate in terms of making those decisions. There's lots of different ways of doing it, and I don't discuss those in the book because it depends on the community. It's a local solution problem that has to be solved locally. A local problem has to be solved locally.

Dave M: All right, well Dave, thanks very much. Really appreciate your time. You've taken us on a very wide expanse here of things we've, you know, the value of water and the price, and how economics impact it. And your book sounds absolutely fascinating. I can't wait to read it. So, for all the listeners out there, where can they go to find out more about you and your book?

Dave Z: Right. So my blog is called Aguanomics, which is agua with a G, not aqua, Aguanomics.com, and the book is easy to find. It's at livingwithwaterscarcity.com. Just livingwithwaterscarcity.com, and you can read sample chapters. I'll have a video up there introducing the book, but you know, it's actually very cheap. It's \$10 for the paperback and \$5 for the Kindle or the .pdf copies because I want people to be able to read this stuff and not pay too much and not take too much time.

Dave M: Awesome, we will include links to those in the Show Notes. Thanks for your time, Dave, greatly appreciate it.

Dave Z: All right, thanks David.

Dave M: You bet.

Dave: Well, that was my interview with David Zetland. He was great to work with, and he sure packed a lot into the interview.

Some of the key takeaways for me were reinforcing the idea that the price of water is frequently much less than the value of water. Another was examining the different rate structures for water, and how an economist views those different rate structures, from the increasing block rates to the decreasing block rates to uniform block rates. And I was very interested in David's notion that increasing block rates are too difficult for consumers to understand, and I was interested in his belief that time-of-use rates likely will not be implemented in water utilities but the currently and more common seasonal rates are good and make a lot of sense. Now, that's a lot of food for thought when looking at how to price water.

And another key takeaway for me was highlighting that water issues are typically local in nature, and these local problems require local solutions. That means cooperation amongst local water



users. And that is another theme that runs throughout a number of the interviews that we've done over the course of The Water Values Podcast.

Well, you can check the Show Notes out for this session at <http://thewatervalues.com/pod9>. And please don't be bashful in letting me know what interested you about the interview by leaving a comment on the Show Notes or by emailing me at david@thewatervalues.com. You can also tweet at me @DTM1993.

I just want to also say a big "thank you" to all of you who've helped the podcast hit 1,500 late last week. We also had our highest ever number of downloads in a single day last week blowing the previous record out of the water by 150%. So thanks so much.

And finally, if you've been enjoying the podcast, please consider leaving a rating and review on iTunes and Stitcher and any other podcast directory on which you download the podcast. That would be so very helpful in spreading the word about the podcast. And don't forget to tell your friends about the podcast and to sign up for The Water Values Newsletter, which can be done at <http://thewatervalues.com>.

Please remember to keep the core message of The Water Values Podcast in mind as you go about your daily business. Water is our most valuable resource. So please join me by going out into the world and acting like it.

Outro: You've been listening to The Water Values Podcast. Thank you for spending some of your day with us.