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## Panel: Water Ethics and Commodification of Freshwater Resources

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# **Panel : Water Ethics and Commodification of Freshwater Resources**

Professor Stephen Diamond, Moderator♦

## **DR. LARRY SWATUK\***

Good morning everyone. I am happy it was raining today. I lived in Botswana for the last eleven years, and there we usually start off meetings by saying “Pula” which means rain, so “Pula!” to you all, and I am happy to see we have it here.

There is much to be said about water, but I will limit my topic to water commodification. There are two aspects to this. You might feel that some of the things I am going to say are rather esoteric, but having lived for fourteen years in

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- \* Dr. Larry Swatuk has spent most of the last fourteen years living in Africa. For most of 1994, he was a Visiting Research Fellow at Rhodes University in South Africa where he began researching the politics of environmental change and natural resource management with an emphasis on the cooperative potential of such activities. In 1995-96, Dr Swatuk was Senior Research Fellow at the African Centre for Development and Security Studies in Ijebu-Ode, Nigeria. From 1996-2007, he was employed at the University of Botswana first as a Lecturer in the Department of Political and Administrative Studies and second as Associate Professor of Natural Resource Governance at the Harry Oppenheimer Okavango Research Centre. During 2001 he was a Ford Foundation Senior Fellow at the University of the Western Cape, South Africa. Presently, he is on sabbatical in Halifax, Canada, where he is Adjunct Professor of International Development Studies and Research Fellow, Centre for Foreign Policy Studies, Dalhousie University, and a sessional lecturer in the Departments of Political Science and International Development Studies at St Mary’s University. Dr. Swatuk has published extensively on water resources issues in Southern Africa.

Africa in an extremely remote area in Botswana at the foot of the Okavango Delta, I am a very practical person when it comes to water management issues. But on another level, as an empowered person of a certain status, I have the luxury of being able to stand back and reflect, and it is this theoretical and philosophical aspect of water that I want to emphasize here.

Having lived in Africa, I am very concerned about how plans and decisions made following water discourse in the high consumption world are spilling over into the low consumption world. Globalization is forcing these frameworks on the low consumption world where they are having completely perverse kinds of effects, and yet, we treat these frameworks as if they are universals, but they are not.

When you asked me to talk about the water ethic, I began thinking immediately about Aldo Leopold's *The Land Ethic*. Sixty years ago, Leopold talked about the land ethic: how we should build it and treat nature centrally in our daily lives.<sup>1</sup> However, sixty years later, Leopold's suggestions have gotten us nowhere.

I begin with a quotation from the United Nations' World Water Development Report Number 2: "Water, A Shared Responsibility."<sup>2</sup> We always talk about how we value water, how water is a complex entity, and how, if we are going to look at the economic value of water, we must build respect for water into our cultural and other values.

The European Commission's Water Framework Directive says that water is not a commercial good like any other.<sup>3</sup> Water is a heritage, and we must protect it. However, it is a short road from treating water as a complex entity to turning water into a commodity.

How did we move from the goal of treating water in a complex way to turning it into a commodity? The commodification of water begins with public policy. Public policy must serve social ends, and in order to determine social ends, we must engage in a valuation process, treating water as a good that can be traded and marketed, thus giving a common metric. If we frame everything in terms of dollar values, at least we know what we are talking about and can level the playing field.

Rather than draining the wetland, it performs X services and that saves us X billion dollars. There is an in-building of the economics of water, which comes

1. Aldo Leopold, *The Land Ethic*, in ENVIRONMENTAL ETHICS 41 (Michael Boylan ed., 2001).
2. U.N. Educ. Scientific & Cultural Org. [UNESCO] et al., *The United Nations World Water Development Report 2: Water: A Shared Responsibility* (2006), available at [www.unesco.org/water/wwap/wwdr2/table\\_contents.shtml](http://www.unesco.org/water/wwap/wwdr2/table_contents.shtml).
3. Council Directive 2000/60/EC, pmbl., 2000 O.J. (L327) 1 (EC).

from the Dublin Principles<sup>4</sup> and the notion that water falls freely, but pipes cost money.

We have taken this economic turn because globally we know that water is used economically inefficiently, environmentally unsustainably, and socially inadequately. If we are going to move toward integrated water resources management, maybe treating water as an economic good is the way forward.

The question then is how specifically can we intervene to do something about the treatment of water as a commodity? The problem is that our response is unproductive and poorly governed. The economic argument claims that if we arrive at the true economic cost of water, it will fix our response. The argument is that we are wasting money through our mismanagement. So maybe we should treat water as a commodity, hoping that the market will lead us to the best use. Knowledge-building of the true cost will help in-build it into the price and we will have Best Practice. You all know the buzzwords.

If we do decide to treat water as a commodity, we then must involve the private sector because the public sector is often seen as inefficient and corrupt. If we can involve the private sector and improve the public sector, we then have perhaps a public/private partnership. That argument is logical, but it is also controversial. Most people take a more techno-centric view, unwittingly perhaps, focusing on ingenuity and making the situation better through the application of technological fixes.

The more ecocentric argument—that water has intrinsic value or that it has other kinds of values in nature that are outside of economics—tends to fall away. This heavy dominance of the economic arguments forces other people who do not believe that water should be commodified and who have interests in preserving ecosystems, conserving nature, or thinking about the spirituality of water, to speak the language of economics. This forced economic discourse results in a new language that seeks to reconcile technocentric with ecocentric approaches to water use and management. For example, we now have many new conceptual weapons in the struggle for sustainable water systems: “virtual water”; ecosystem services; ecological valuation; green water credits; environmental base flow; and basic entitlement to treated urban water above which one should pay for water are all new ways of thinking about water.

4. *The Dublin Statement on Water and Sustainable Development*, International Conference on Water and the Environment, Dublin, Ir., Jan. 31, 1992, available at <http://www.un-documents.net/h2o-dub.htm>.

There are three major ethical considerations around commodification. One of those considerations is of use. But if we always talk about use, we end up with a discourse dominated by those who have the economic capacity to pay for that use. Real win-win solutions only occur among the winners. In order to get that water in the first place you created losers—those users left around the margins who are never thought of again. The economically empowered are the ones who are taking part in the discourse.

Water markets are generally driven by those who have the most capacity to participate in the market: big irrigation, industry, and those with urbanization concerns.

Another ethical consideration is that water is not just a public good because it can be and is captured easily. However, no limits have been placed on this capturing of water. What happens to spiritual interests in water when someone has privatized the water resource and sold it to a third party?

None of these concerns should come as a surprise. They are all well-known and articulated in “Water: A Shared Responsibility.”<sup>5</sup> We also claim to know what must be done:

- Don’t pollute; if you do, you pay to clean it up.
- Don’t deplete.
- Put nature and the poor first.
- Preserve pristine spaces.
- Let the ecosystem determine the degree of development: minimize ecological footprint.
- Create reflexive, iterative, transparent, and inclusive discursive spaces: decision-making process.

However, we seem to be a long way from achieving our goals. Will turning water into a commodity help? If we talk about commodification, if we talk about water as a commodity only, what we are doing is that we are privileging an economic discourse above all others.

The commodification of water both forces us to speak economic language and often undermines competing values. We reduce water to its use value to humans. Commodification reduces everything to capital, including humans. Water is not water, it is natural capital, with an economic value.

Now why don’t we just reflect for a second on the twenty-first century world. We know that nothing we do under late modern globalization is sustainable,

5. UNESCO, *supra* note 2.

nothing. I went on to the Ecological Footprint website and I think last year I consumed 5.9 earths or something like this. This is the economic fact of life: that nothing we do is sustainable. This applies to water as well. However, water is unique and cannot be separated out as a resource because water is in everything. If we have an unequal society, then we have an unequal supply of water. If we have inequality across the world, we have an inequality of water. If things are unsustainable, then the water supply is also unsustainable. We cannot talk about a water ethic on its own.

In conclusion, the big goal is to pursue ethics to achieve a better integrated water resources management in industry, ecology, agriculture, and all other sectors. But from a practical perspective, we still have to engage in some kind of strategic thinking. If you can gain an inch somewhere, take it. I like to think of pursuing ethics in terms of achieving integrated water resources management. For example, in Southern Africa, if I can gain an inch somewhere, then I will take it. Just because the whole framework does not work does not mean we should not try to move forward wherever we can.

But let's not lose sight of the big picture. The best way to consider the issue is to not consider water on its own, but to put water back into the environment, and then to put the environment back into development. Development then has to go back into the world.

We are not going to manage our way to a water ethic. If we are going to make a way forward, people like Vernon [Masayesva]<sup>6</sup> are going to have to find likeminded people around the world because they have the numbers, whereas the big corporations have the power.

Lastly, we should not be afraid to get into arguments. If we are going to move toward consensus, it is extremely important that we build open, inclusive, transparent processes of decision-making. That is extremely important.

I am working on a two-year project in South Africa right now to determine the appropriate level of stakeholder involvement in river basin management. And that is going to be a huge battle. Even though we think we have created inclusive spaces that act like global forums, what we have really created is two increasing solitudes: a world economic forum and a world social forum. These two solitudes meet in parallel but do not talk to each other. We also have people who are now interested in an alternative world water forum. But rather than working toward

6. See *infra* presentation of Vernon Masayesva p. 29.

inclusion, the danger is that we are going to go away from discussions like this one today and create our own solitudes.

Keep talking about this, and as I always end, the struggle continues.

**PROFESSOR JAMES HUFFMAN\***

I grew up with an agricultural economist father whose PhD thesis, published around 1950, was about irrigation. As a consequence, all of our vacations as children were spent traveling around the West, going to the Western Farm Economics Meetings, and looking at dams. My father had a real fascination with dams, and I think I have seen them all, at least all of the big ones throughout the West.

But at the end of the day I would take a very different view than my father would have. He was a government interventionist, and I take much more of a pessimistic market position.

Commissioner [Robert] Johnson<sup>7</sup> and Larry Swatuk expressed one view of this problem: that we can somehow reach a consensus on water management by simply talking to each other and by communicating ethical principles amongst each other and somehow overcome the big guys who have dominated water management.

I guess this will sound entirely too economic, given what has just been said, but I do not see any other way to view this problem except as an economic, resource allocation problem. Perhaps the use of the term “resource allocation” makes it an economic problem, but it is a useful description.

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7. Robert W. (Bob) Johnson joined the Bureau of Reclamation, U.S. Department of the Interior, in 1975, and has spent his entire federal career with the agency. He was confirmed as the 17th Commissioner of the Bureau of Reclamation on September 30, 2006. Commissioner Johnson presented the second keynote address at this symposium. His comments are not included in this publication.

We could say it is a choice-among-ethical-principles problem. We could say it is a choice-among-social-values problem. But those are all ways of saying we have a finite amount of water. The challenge is figuring out how to allocate the water we have among various uses or non-uses and how to distribute the benefits and the costs of those alternative uses.

When an economist talks about allocating water to alternative uses, they could just as well be saying non-uses. In other words, for an economist's purpose, leaving water unused is using it for that purpose of not using it. Well where does ethics come into that? I think ethics speaks to the values that help us decide how water is going to be used or not used.

Now commodification, as it has been used in these water debates, particularly in the context of ethical concerns, carries with it the meaning that it is an unethical way to proceed. Typically, those who advocate commodification are the bad guys, while those who advocate ethical water allocation are the good guys. However, this is a simplistic and unhelpful way to look at the big picture. Commodification is actually a way of bringing ethics into water management, because it creates the kinds of incentives that are necessary to lead people to use water in ethical ways.

Now the term "commodification," for an economist, simply means that a commodity is anything for which there is demand and which is supplied without qualitative differentiation. In other words, water is water, even though we know that is not always true. But for many uses and non-uses of water, water is just water. Water is undifferentiated in any particular market. So in economic terms, water is a commodity. Like oil, gas, or minerals, water is purely a definitional thing, not a value statement.

Ethics can influence our decision about whether to commodify, or market, water in two ways. First, ethics comes into play in an interpersonal way with a focus on wealth distribution. Wealth distribution refers to the way in which water is being used and not used and the resulting benefits and costs being distributed. This is ethical in a sense of interpersonal relationships. For example, do the poor have access to an ethical amount of water—the amount of water that they should be getting?

The other way ethics is often used in this debate is with respect to nature. The idea is that there are intrinsic values in nature, including intrinsic values in water. Markets are not very helpful with respect to the latter approach. This approach is ultimately a very difficult one for human beings to comprehend and to discuss. If I say water has an intrinsic value as a habitat for fish or as a spiritual experience, watching the water flow over Niagara Falls, what I am really saying is that I value



those things and they are important to me. Choosing to describe such things as ethics turns a personal preference into a value on a higher moral level that attempts to trump the policy debate. If it is just something I care about, then I am just like anybody else. But if it is ethical, if it is a value that qualifies as ethics, I am on a higher level. I get to trump the policy debate.

So why do I think that markets and commodification might be ethically good? Well we might look at integrating these two things.

The current approach to water use utilizes markets a little more than we used to, but not nearly as much as we might. However, whether you are looking from a wealth distribution point of view or from a nature protection point of view, we use government management to a significant extent, particularly in the American West. Therefore, if you want to lay blame for the ethical problems that exist, the blame rests far more at the feet of government and government intervention than it does in markets.

While one might pay \$1.76 per acre-foot for water, what does it cost to desalinate water? Ten years ago, I heard it was in the neighborhood of a couple thousand dollars per acre-foot. I do not know what the price is today, but I know it is a lot more than \$1.76.

How can you have a world in which some people are paying \$1.76, \$5.00, \$10.00, or \$20.00 per acre-foot, and other people are paying \$2,000.00 per acre-foot? It is an irrational world, and it is a world that would not exist had the government not intervened and subsidized those who are paying less for their water.

We live in a world where government intervention has moved water all over the American West and created fast dam systems. I live on the Columbia River at a great salmon run, and most people think that the reason the salmon are in trouble is because of the many dams that the Department of the Interior and the Corps of Engineers built on the Columbia River system.

Although it is a complex world and our models do not seem to predict as accurately as one would hope if the salmon are going to come back in a given year, there is little doubt that those dams have had a huge impact. These dams surely would not have been built with private money and likely would not have been built in a purely free market situation.

Now, I do not want to suggest to you that markets are the whole solution. I think government has an important role to play. Using current trends such as comprehensive integrative river basin management, we can arrive at a socially defensible or even ethical allocation of water. If we just get all the stakeholders

around the table, we will reach an agreement, a consensus. That is the way everything is being done in Europe.

Look at the example that Commissioner [Robert] Johnson mentions in the Southeast United States: the Apalachicola-Chattahoochee River system, which flows through Georgia, Alabama, and Florida. The three states have been in court for eighteen years now and have basically resolved nothing. I would suggest the reason it has come to nothing is because the three states do not know what their relative positions are and what rights they have, so they cannot negotiate in a meaningful way.

They have no basis to negotiate other than the fact that Georgia has the topographical advantage of being upstream and can take the water first. Now they have got to deal with the federal government because they run Lake Lanier, which is where Atlanta gets most of its water. I predict that this will still not be resolved in another eighteen years. The only way it is going to get resolved is with federal intervention in the form of either a Supreme Court or Congressional equitable reapportionment.

Apportionment has worked on the Colorado River, more or less, because for a long time we have had a relatively clear definition of how much water is in the Upper Basin, how much water is in the Lower Basin, and how much water each state gets. And that provides some basis from which to proceed.

What commodification and markets imply is that people own a resource in a way that allows them to talk with each other. They can transact with each other and can come to agreements that are not dependent on political power but are dependent on rights that the legal system has defined.

One real problem we face is deciding that a project is a success simply because we have created a process, even if we have not allocated the water. This is what took place with the CALFED Bay-Delta Program.<sup>8</sup> From my point of view, CALFED looks like a total failure. The program has not solved the problem, and I do not think it is going to solve the problem until we sort out who has what rights in the system. If you do not want to call them rights because you do not like talking about people having rights in water, then call it something else, but that does not change the nature of the problem.

8. CALFED is a collaboration among twenty-five state and federal agencies that came together to improve California's water supply and the ecological health of the San Francisco Bay/Sacramento-San Joaquin River Delta. *See* Welcome to CALFED Bay-Delta Program, <http://calwater.ca.gov> (last visited April 14, 2008).

I would suggest to you that if you do commodify, clearly identify what rights people have as best you can, and that is not a simple matter. It requires negotiation and litigation. Although sometimes unpopular, litigation is critical in helping to define what rights people have.

Incentives matter immensely. Since institutions influence the creation of these incentives, you need to create the right kinds of institutions so that people have incentives to do the ethical thing.

Do not throw out the good in search of the perfect. We are never going to find the perfect solution to this problem. But if we have institutions that are working reasonably well, we should run with them.

**MR. HARRY OTT\***

I have had the privilege of leading the water team at Coca-Cola since 2003. What I am going to share with you today is just where we are on the journey because it is a journey, and as I can see it there is no end point to it. I am going to share with you how Coca-Cola is responding to water issues as a company who depends on water as its vital resource.

When I took over the water team, I spoke with the Executive Committee about our policy toward water. The committee asked me why we should put all this focus specifically on water since Coca-Cola was already doing a lot for the environment in general. I responded that there were many emerging signals that indicated that, in the future, we will face water scarcity and water quality

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problems. And if we do not have water, Coca-Cola will be out of business regardless of how many trucks, plants, and other ingredients the company has.

When I said this to the Executive Committee, there was stunned silence in the room at first. Then, they asked me how we as a company can address these future problems. My response was that Coca-Cola needs to value water like it values the other physical components that go into making Coca-Cola products. In other words, Coca-Cola must value water from a financial standpoint as well as a physical one.

The Committee's response was that water was cheap at that time. In most places, Coca-Cola pays nothing for the water it uses; we simply pull it out of the ground. I responded that water is not going to be free in the future. A lot of work has been done by people like Peter Gleick at the Pacific Institute on these emerging signals I have mentioned. Those kinds of things are going to drive business. If Coca-Cola wants to stay in business in the future, the company is going to have to do something now about preserving this critical natural resource.

Water is a natural capital. Coca-Cola has been working on water conservation in our one thousand plants worldwide for decades already. We have been focusing inside the walls of Coca-Cola, but what we had to do was convince our management, because the potential for change starts at the top. You must have the support at the top of a big corporation to make substantial change. If you do not have the support of top management, you will get a small amount of money and a little attention just to look good, but you will not achieve significant change.

Mr. Neville Isdell, Coca-Cola's CEO, recently said that companies cannot be involved in every single issue that needs resolving at the moment. Companies can only get involved in those issues that are integral to their business, such as availability of clean water in our case. Coca-Cola must be an integral functioning part of every community in which it operates because it obtains its water from local sources.

Mr. Isdell has grasped the point that we are local. Coca-Cola is a local company that operates globally. Those of us in corporate management do not run those plants. The local managers run the plants and conduct local business. The products are sold locally. Coca-Cola does very little exporting out of countries overall. Therefore, it is especially critical to understand that we are a part of those local communities and that we must value this resource.

This connection to the local communities was brought home to me in Africa when I visited a plant in Tanzania. When I visited the plant, hardly anyone was at work because most of the employees were sick with dysentery from the local water

source. The employees did not get dysentery at the plant, since the plant water is filtered and cleaned. Instead, the dysentery resulted from going home and drinking the local water. So if you do not have good local community water, then you are not going to have productive employees.

We broke our water program at Coca-Cola into four categories: plant performance, watershed protection, supporting community initiatives, and global awareness and action.

Our goal at Coca-Cola is to replace every drop of water we use in our beverages and production to achieve balance in the communities and in nature with the water that we use. Coca-Cola is setting specific water efficiency targets to achieve this balance by 2008. The company is also working to be the most efficient user of water as compared to other companies in our market.

Those are actions we are taking the plant walls. Thinking outside the bottle, so to speak, outside the walls, is also critical. In addition, Coca-Cola wants to recycle both water and wastewater after we treat it. We hope to return all water that is used in the manufacturing processes to the environment at a level that supports aquatic life. We will attempt to accomplish this goal by having full-scale wastewater treatment plants at all of our facilities that do not have access to municipal treatment facilities.

To replenish what we have used, Coca-Cola will expand support of healthy watersheds, and help support sustainable communities to balance the water we have used. This will require system-wide engagement. For two years, we have conducted water risk assessments in all twenty-six divisions of Coca-Cola. Working inside and outside the plant, this assessment revealed that we did not know a lot about the watersheds that surround many of our plants.

So, we made a commitment to partner with the WWF,<sup>9</sup> UNDP,<sup>10</sup> and others to learn about what we should be doing outside the walls of our facilities to help preserve our water resources. Together with the WWF, we have developed a water metrics and evaluation tool that looks at watersheds, instead of just looking within our plant. We also work with USAID<sup>11</sup> on water hygiene projects. In addition, we have developed a source protection management tool in partnership with these NGOs and government agencies. This tool is going to be extremely valuable because we do not know a lot about how watersheds really work.

9. World Wildlife Fund [WWF], <http://www.wwf.org>.

10. United Nations Development Programme [UNDP], <http://www.undp.org>.

11. United States Agency for International Development [USAID], <http://www.usaid.gov>.

How can we balance the use of that valuable resource without understanding how watersheds really work? That is why we have made the commitment both financially and in partnership with these others to learn more about watersheds.

We have developed our own water efficiency tool kits, which include wastewater treatment plant design and operation. Coca-Cola is probably about 88% complete with our wastewater treatment plant installations. We have already finished all of the designs.

We expect that by 2010 we will be 100 % compliant with our own internal policy of having these full-scale wastewater treatment plants in place. This will mean recycling and reuse of that water wherever it is possible—for wash down, truck washes, things like that, just recycling and reusing it.

We at Coca-Cola have found that having partners is critical because our partners have the expertise, credibility, and viability. This work has been a real learning process for us, and sometimes a rude awakening, about how we were operating in places and how we can improve it. Partnership is a critical part of the journey. I am part of GEMI,<sup>12</sup> the Global Environmental Management Initiative, which is a collaboration of forty-five major companies. Working with GEMI has helped many companies establish a water sustainability road map. Having partners helps us go through the plants with a fresh set of eyes and establish goals, including the water targets I mentioned earlier.

More importantly, it is necessary to look all the way back up the supply chain, which many companies are paying attention to do now. For instance, taking into account all of the water used throughout the entire supply and production chain, for every liter of product we produce, we may use 150 to 175 liters of water.

Now we can help agriculture through drip irrigation, conservation methods, or better efficiency with our own suppliers to reduce the amount of water used for agricultural purposes. This will make a great difference because agriculture uses the greatest amount of water—80 to 85 percent of the water consumed is used in agriculture in developing countries where water waste and inefficiencies are most common. Some of these wastes and inefficiencies come from our own suppliers.

Therefore, we are working with our partners to reduce waste and improve watershed health, especially in the seven major water basins in the world. In these partnerships, it is so important that we share this information when we develop it

12. A business that helps other businesses improve their environmental, health, and safety performance, shareholder value, and corporate citizenship. The Global Environmental Management Initiative [GEMI], <http://www.gemi.org>.

because knowledge is the power to understand accurately how we can be water sustainable in the future.

That stewardship comes as some of the other speakers have said, from an understanding of what we are dealing with, rather than focusing inside the walls of whatever organization or company you are working with. It is important to use the power of marketing communication not only to market products, but also to market the message about the importance of conserving, recycling, and reusing.

For example, we have 120 projects in fifty countries that we have started in the last four years. We are just beginning and even though we have accomplished a lot, we also realize the real magnitude of the situation. It is going to be a long journey to get everything done. A few examples of our projects in the United States include protecting freshwater resources, removal of dams, reintroduction of endangered fish, and engagement of local watershed groups.

The key to success in the future is doing something besides returning home after a meeting like this and going back to your own little world. We need to continue this discussion and work in partnership with these groups. Our group in Spain has done a great job on an educational program about furthering public awareness through mass media campaigns about water savings.

In Australia, we are working on community capacity building. Sometimes just getting people together and addressing the issues the groups have—whether activists or NGOs—getting these groups together in the same room to talk can be a very difficult task, but can have very valuable results.

In developing markets in Bolivia, we are funding some watershed rehabilitation projects. We are also helping to improve collaborative management between regions that were not working together previously.

Mali is a great example of the need to understand hygiene and sanitation in these developing countries. For instance, you cannot have a cattle farm upstream from your water intake. That may sound crazy to us here in a developed country, but it happens all the time and is an issue that we can correct in many cases.

In Indonesia, programs include hygiene promotion, reforestation, and “going green” in the schools. Working in the schools is another important thing.

Strategic communication is also important. If you do not talk to other groups about what successes and what failures you have had then you have missed a great opportunity to help them understand or bring them into working groups or collaborations on critical issues such as water resource management and watershed protection. Community outreach has been one of the most important, positive steps we have made so far.

Using brands to communicate is important as well. For example, Budweiser does a lot of branding around supporting fishery groups and fishermen on certain streams. This can help provide a little money for people who want to start projects but do not know where to go.

This is all part of that collaboration. But the real key is demonstrating global leadership by mobilizing people, groups, and other interested parties to sit down together, engaging, and inspiring them to come to resolutions together about water ethics and stewardship.

So that is where we as a company have taken some very positive steps in trying to do our part on this critical issue. Today, we are looking at water very differently than we did twenty years ago, and success will happen through the valuing of water through these partnerships. If we can inspire other people and other groups to work on managing this critical natural resource, I think we will have a lot of success in the future.

Thank you.

**MR. VERNON MASAYESVA\***

Greetings in Hopi. Hello, goodbye, be happy, be Hopi.

I would like to share my knowledge with you, knowledge given to me by the elders of my tribe and by water. Water is a great teacher, as you all know to some extent. Water is not a commodity. Water is your soul, it is spirit, and it has memory. Water sings its own song, as the Hopis say.

We learned about water by being farmers in the high desert in Northern Arizona that we call Black Mesa for over one thousand years. There, we have annual

\* Vernon Masayesva is a member of the Coyote Clan of the Hopi Tribe in Northern Arizona. He is from the village of Hotevilla on Third Mesa, one of the fingers of Black Mesa. Mr. Masayesva, who is fluent in Hopi and English, received a B.A. at Arizona State University in Political Science and a Masters of Arts from Central Michigan in 1970. He returned to Black Mesa and served as Principal of the Hotevilla-Bacavi Day School, the first Indian-controlled school on Hopi. In 1984, he was elected to the Tribal Council and then served as Tribal Chairman from 1989 through 1993. From 1995 to early 2001, he was director of the Arizona Native Scholastic and Enrichment Resources Program, a joint effort with the University of Arizona's American Indian Studies Program and several private schools in the state to provide talented Native American students with educations at independent college-preparatory schools. Mr. Masayesva has been involved in the tangled intricacies of coal and water mining on Black Mesa for decades. Today, as Director of Black Mesa Trust, he has successfully helped to stop the use of pristine N-aquifer water, the sole source of drinking water for the Hopi people, to slurry coal from Black Mesa Mine to the Mohave Generating Station in Laughlin, Nevada. Former President Clinton identified Mr. Masayesva as a "quiet environmental hero."



rainfall of about ten or twelve inches. We have no lakes and no running rivers, so our irrigation comes in the form of a blessing from the spirits, from the ancestors, and from the cosmic world.

We believe that if we behave properly and do things with one heart and one mind, focusing on our intent to bring rain, the rain people will feel the energy coming from our body. And if it is good energy, it will resonate and visit us as rain. When the first raindrop comes, we always say thank you for visiting me and thank you for remembering me.

The Hopi way of life is really focused on intent to survive in the desert as farmers, and to do that, we cannot treat water as a thing; we must treat it as a living force from whence we all come.

We all are water people. All of us came from water. We are walking the earth as water people, like water in the traditional Hopi water gourd. When we pass away, our physical body goes down into the ground and the liquid in our body rises up into the cosmic ocean as mist, as our breath. Since water is non-destructible, it has three faces as a solid, gas, and liquid. Water cannot be destroyed, and it carries with it a lot of energy.

Water is two parts hydrogen, which is also what fills the sun. We are carrying that within our bodies right now because we are water people. So if water is sacred, and we all come from water, then your life is sacred. A fundamental question here is what value do you put on a sacred life?

There is a place called Prophecy Rock about five minutes from my house.<sup>13</sup> Hardly anyone visited Prophecy Rock in the past, but now there seems to be a worldwide interest in the rock. According to some people, the rock was put there over one thousand years ago when there was a split in the village that is considered to be one of the youngest of the original Hopi establishments.

The split occurred when one faction wanted to stick to the Massau'u path. Massau'u is a caretaker of the land and he is pictured at the bottom of Prophecy Rock [referring to drawing of petroglyph], at what we call emergence to the fourth world, which we are living in now. Massau'u is pictured again on the right side of the rock on an unending path next to a little cornfield. The path at the top right of the rock is an uneven line that ends, but the bottom path—the Massau'u path—does not end.

Prophecy Rock means many things, but mainly it signifies separation, for example, between science and mysticism. When Massau'u was asked whether he

13. Prophecy Rock is a petroglyph on the Hopi Reservation in Arizona that describes the life path of the world.

owned the land, he responded that he takes care of the land and belongs to the land, but he does not own the land. Massau'u did not know what property or privatization meant. There is a perfect circle on Prophecy Rock that symbolizes life in harmony.

In our ceremonies, we often use pieces of braided thread, and I like to carry one with me at all times. We wear it on our wrists, and it symbolizes the way life was once intertwined. However, at some point, something happened and life began to unravel. Now we are on two different paths. For example, now we have commodified water, and we are using it to accumulate enormous wealth. Money has become our God.

Talking specifically about water, I have to go back to the prophecy that we will go through several wars. The final war will be fought in a very religious, holy place. The final world war is not going to be over terrorism or oil, but is going to be over water. Hopis say we can avert that war. We are at the eleventh hour of the fourth world, but there is a hope for the creation of the fifth world. We must intertwine science, technology, and engineering with indigenous knowledge, utilizing a respectful dialogue rather than a debate.

Albert Einstein, the great scientist and one of the greatest minds, actually came to Hopi land. His famous equation, of course, says that energy consists of matter and the speed of light squared. We are all matter. We are all particles, atoms, whatever you want to call it. Scientists have figured out how to use this equation to release energy in the first atomic bomb. Then there is the Hopi side to Einstein's famous equation. We express it like this: M is mankind and  $C^2$  is cooperation and consciousness.

If more and more people become conscious of what is happening to water, we can create enough energy to avert the end of the fourth world. This is the simplest message. Consciousness-raising has to come through public awareness. We need to have businesses, other scientists, and people in cosmology all coming together and sharing scientific knowledge with our eastern mysticism. If we come together and bond, together we can save the world and bring holiness back to this earth.

We are creating a hell on earth, but this was once heaven, the Garden of Eden. I would like to see the Garden of Eden again, which is why I have dedicated myself to giving talks wherever I am invited. I run an organization called Black Mesa Trust, and we are very poor, but nevertheless, I am dedicated to spreading the message and sharing what I was blessed to be given.

Water again has three faces. Water also is what creates speech, as it goes through your larynx and comes out as words. So water is the word. Triangles are

very prominent in our culture. They also represent the three main characters of our creation: the Spider Woman and her twins. One twin is the Weaver who creates things, like an engineer or scientist today. The other twin is the Echoer, who communicates and receives communication. The Spider Woman takes care of the twins. She represents the unique intellect and mind with which humans are gifted.

We have a moral responsibility to do the best we can to create the fifth world. The idea is not to repeat the bad mistakes made in this world, but to learn by those mistakes. For example, the only way to really know peace is to experience war. If we do not repeat these bad mistakes, we become morally and ethically stronger people. In other words, you come close to being a Hopi. "Hopi" means peace, and represents a life in balance. As a water messenger, I carry prayers for peace through water.