The World Water Crisis: Problems, Crisis Regions, Action & Solutions Based on Regional Opportunity

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The World Water Crisis: Problems, Crisis Regions, Action & Solutions Based on Regional Opportunity

Senior Thesis
Moira Kelley
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ABSTRACT


This thesis explains a number of factors that are associated with the world water crisis through a multi-layered study. By examining a varied of severity levels in specific regions, the action being taken by local, national, and multi-national organizations, and solutions which present themselves to regions, I discovered the importance of everyday conservation. The research for this thesis came in two forms: (1) a review of the literature on the current crisis and (2) an action-based method which taught local high school students about the water crisis in addition to the local and global impact of personal water conservation. Findings from this research come in the form of evaluations and personal statements from students that proved the lesson taught was effective. I hope the success of the lessons in my action-based thesis will propel the students to be more aware of unnecessary overconsumption of water and to, subsequently, stop the progress of the current crisis.
INTRODUCTION

Our world is faced with a growing number of environmental concerns each day. We, as a global community, have taken appropriate steps in solving a select number of environmental issues with our current resources – issues such as alternative energy and recycling. However, water is the one resource that cannot be replaced nor created, leaving the world with one option for water’s sustainability – conservation. Water is absolutely necessary for life as our bodies are made up of 70% and we can only live mere days without it. Growing conversation on the water crisis topic is evident in our society today, but we need more than conversation. We need action.

This thesis discusses a wealth of literary information on the crisis. Elaboration on problem areas is essential for unearthing solutions based on regional opportunity. With special emphasis on all regions greatly affected, this thesis allows the reader to understand the crisis is affecting both third-world and developed nations. Discussion of problems stemming directly and indirectly from the crisis sheds light on the repercussions of the unhealthy lifestyles of water abuse we have become so comfortable with. Next, action being taken by local, national, and international organizations has helped to get the word out but more action is needed. Finally, an explanation of the solutions is important to moving forward in solving the crisis at every level.

New England sits comfortably knowing that its fresh water sources, right now, are abundant, unlike regions on the west coast such as California. California’s water crisis has led to their schools introducing water conservation lesson plans at all stages of education. Research for this thesis comes in the same form – that of education at an early
stage. The research questions posed are as follows: *do students in the greater Providence area care about issues such as the water crisis and if they do, can a unit on water conservation be successfully implemented into the school curriculum? Upon understanding the severity of the current crisis, would students be willing to alter their lives to avoid a greater crisis in the coming years?* Through a specific video presentation and a series of water consumption activities, this thesis will find the answers to these questions. Subsequently, the “Findings” and “Conclusions” section of this thesis will explain the research and the evidence for the answers to the posed questions.
LITERATURE REVIEW
Executive Summary

This review discusses the literature on the World Water Crisis in various regions around the world. Some of the regions are facing severe issues concerning water shortages, resource depletion, water privatization, and political conflict concerning water sources while other regions currently face less extreme issues. This review intends to provide a clear definition of the water crisis in addition to key factors that place the world in crisis today including: the major problems facing regions and their specific issues, problems generally stemming from the water crisis, specific examples of actions being taken by various prominent organizations to solve the crisis, and a list of solutions based on regional opportunity. Several books, articles, and action progress reports have provided a number of solutions for the crisis depending on opportunities that each region can sustain. These solutions are provided in this review as well as a personal opinion based on past and current research.
List of Abbreviations

BCM – Billion Cubic Meters

MDG – Millennium Development Goal(s)

UN – United Nations

UN DESA – United Nations Department of Economic and Social Affairs

UNEP - United Nations Environmental Program

USA – United States of America

WWC – World Water Crisis
"There is a water crisis today. But the crisis is not about having too little water to satisfy our needs. It is a crisis of managing water so badly that billions of people - and the environment - suffer badly.” World Water Vision Report

Water is the one resource in this world that is necessary for life. There is no substitute for water and there is no way to reproduce water. These facts are known by all people around the world, and yet there are millions of people who overuse this resource. Currently, one out of every five people (1.1 billion people) does not have access to clean water, one in two (2.6 billion people) lacks safe sanitation, and about “6,000 children die everyday because of infections due to unclean water.” Shocking as these facts may be, the crisis is here and evident in every society. Unfortunately, there is no way to backtrack through this crisis. The only solution is recognition of this issue and a commitment of every citizen in this world to be smarter and safer about water use, consumption, and sanitation.

Common misconceptions implanted in the minds of citizens in developed nations remain the foundation for the growing water crisis. Many people are under the impression that their water is not only steady, but everlasting. Closer looks, however, at each region of the world provide information that solidly disputes this notion. When presented with facts about the drying-up of rivers, reservoirs, or aquifers, suddenly uneasy citizens retort with the same response – “water must be easy to replace because

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2/3 of the Earth’s surface is water.” Here in lies one major misconception. The water that covers most of the Earth’s surface can be used for neither drinking nor irrigation due to its salinity levels – it would add no nutritional value and would further dehydrate the drinker or kill the crop. Only 2.6% of the world’s water is drinkable and 2/3 of that water is locked away in glaciers and ice caps – this leaves us with 0.01% easily accessible drinkable water. Twenty percent of what is left is either found in extremely remote places or comes at unfortunate times in unattainable fashions such as monsoons or floods. Surprisingly enough, 80% of all fresh water in the world is used for irrigation and the cooling of electrical power plants rather than for consumption.

In totality, human beings are left with less than one percent (0.01%) of the world’s fresh water to use for everyday life (drinking, irrigation, washing clothes and dishes, cooking, etc). As if this fact were not appalling in itself, statistics show that the world’s population will grow 40%-50% in the next fifty years. This population growth will cause our current water usage to rise by an estimated 40%. Simply put, human beings are in a crisis right now; however, the crisis is only expected to become worse in the coming years. Consequently, it has become necessary to find immediate as well as long term solutions to this problem to avoid disasters that cannot be remedied.⁴

This review of the literature is intent on providing a clear definition of the crisis we as human beings face today, the major problem areas currently and their specific issues, problems generally stemming from the water crisis, specific examples of actions being taken by national and multi-national organizations to solve the crisis, and finally, an explanation of solutions based on regional opportunity.

⁴ World Water Council.
PROBLEM AREAS

The World Water Crisis (WWC) affects, in some way, shape, or form, every nation in the world; yet, some countries are in more of a state of emergency than others. The crisis most resembles a scale – with some countries having serious problems and other countries having minor problems not yet escalated to the point of unsustainability. The roots of these problems can be located in a number of issues: the amount of rainfall of a region, the method used to acquire water, the regions proximity to a fresh water source, and of course the economic situation of a country.

Rainfall affects a regions water supply because in many less developed areas the only source of water is from the rainfall itself. While this rainfall is a good resource for some regions where rain is a reliable source, other regions’ rainfall tends to be unpredictable. Most of the rainfall soaks into the earth and creates underwater lakes (aquifers). Many countries – developed and under-developed alike – are pumping water from this ground supply; however, they are pumping at an unsustainable rate causing the current rainfall, as heavy as it may be, to fail in replenishing what is being used from the underground source. This pumping of water from the ground (or more commonly in developed regions, the pumping from a reservoir, river or lake) is one way to acquire water. Naturally, quality of life tends to get the better of human beings and results in overuse thus leading to issues seen in developed regions.

Peter Gleick, author of “Water in Crisis: Paths to Sustainable Use,” notes that the overuse and abuse of freshwater resources has directly contributed to the current water crisis the world is facing. He points out that it is necessary for both nation-states
and international water companies to step up and contribute to the solution of this crisis. His foundation for discussion is that each person needs to be guaranteed a certain amount of clean water to live.\(^5\) Once this right is granted to each citizen of the world, the construction of solutions for individual regions can begin. However, the overuse by the wealthy creates unhealthy disparities between rich and poor – disparities that can result in hunger and death.

Another, simpler, means of collecting water is through the use of rain buckets. These buckets catch the rain water before it soaks into the ground. While this is a good idea, most under-developed nations cannot afford the buckets nor have the means of attaining a rain bucket for their village. There are campaigns run today by crisis-relief organizations that ask those who can afford a rain bucket to purchase one for a family or village in poorer areas.

Unfortunately, most under-developed areas are financially unable to use either of these methods and thus resort to the use of their only “water source,” often times a polluted source. These extremely polluted watering holes often times lead to a number of diseases and this is where the statistics show that nearly 6,000 children a day die due to these illnesses. These diseases are evident in every major region being affected by the WWC. Despite the fact that there are several similarities between each affected region, it is essential to have an in-depth look at each area. Proper evaluation of the crisis in its current state will help to formulate solutions and, hopefully, predict its future path.

PROBLEM AREAS:

Nile River Conflict

The Nile River area has seen several problems concerning land ownership between neighboring villages for several years. The conflict today between these villages is grounded in the fact that water is essential for life and in most poor areas, such as parts of the Nile River, water is considered liquid gold. Clashes that arise around this water source occur mainly because of disputes over land ownership. Those living close to water sources naturally take advantage of their prime geographic location, while others less fortunate tend to continuously relocate closer to the water, creating a more ideal location for the community. This encroachment can turn into a forceful “invasion,” which is what is happening in this area today. However, unbeknownst to the village members, the precious landmark of Eastern Africa, the Nile, is actually running dry. Basically, local conflicts are being instigated by neighbors over a water source that’s depleting everyday. While it is going to take years for the Nile to run dry, the problems associated with a dry river (any river, for that matter) are astronomical. Dependence on fresh water sources such as the Nile is unmatched in African society. Therefore, the Nile River area is facing two problems: a violence issue based solely on access to its water, and a depletion issue.

The United Nations states that a lack of access to water may be the single biggest cause of conflict in Africa in twenty-five years. The most notable conflict as of yet is

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seen at the Nile River basin. Egypt has been dependent on the Nile River for agriculture for hundreds of years. The Nile is the main water source to the area and Egyptians would be jobless and hungry if anything were to happen to their access to the Nile.

Today, Egyptians are threatened by the Tanzanian and Ethiopian governments who plan to make drastic changes to the Nile. Tanzania is campaigning to create a pipeline system to extract water for drinking from the Nile and Ethiopia plans to use the Nile water for irrigation. In 1991, Cairo warned it was ready to use force to protect its access to the Nile water. Despite the fact that it has been over fifteen years since Cairo’s announcement, none of the parties have changed their position toward this issue.\(^7\)

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Hindu River/Middle East

The Hindu River is a sacred river for the people of India and Bangladesh. However, they do not treat it as anything more important than a common toilet. The World Watch Institute estimates that every minute, 1.1 million liters (300,000 gallons) of raw sewage are dumped into the river making pollution levels in the Hindu River among the highest in the world. Clearly, one problem lies in the fact that the river acts as a toilet for those villages upstream; however, the real problem is that the river is a drinking source for communities downstream. This pollution, therefore, leads to water borne diseases such as diarrhea, typhoid, and cholera which are responsible for 80% of deaths around the world – most being children.²⁸

According to N.D. Jayal’s article “Destruction of Water Resources – the Most Critical Ecological Crisis of East Asia,” water depends on a system of renewable actions that ensure its stability. Jayal argues that pollution from human beings, as is the case with the Hindu River, is the reason for the irregular supply of water. Jayal demands a recognition of the problem be addressed and a separation of ecologically “vital” and “non-vital” needs be listed.²⁹ If the Hindu River is going to be used as a main watering source for drinkers, polluting it with human excrement needs to cease. This would mean steps would have to be taken to find another area dedicated to sanitary excrement waste – a feat the government has yet to take on.

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In addition to the sewage present in the water, there are also high levels of arsenic as a direct result of government building construction sites on the River’s banks. To top off the problems that the River is facing, the glaciers that supply the river are melting causing a drought at the end of the river. Seeming like an oxymoron, the glaciers are actually melting, at a rate slow enough to evaporate but not quick enough to sustain the normal flow of the river. In turn, the drought has led to the depletion of Sundarban wetlands and mangrove forests of Bangladesh.  

Furthermore, India itself is facing a problem that most countries are confronted with today. According to Maude Barlow and Tony Clarke, authors of “Water Privatization: The World Bank’s Largest Market Fantasy,” the World Bank’s invested interest in water companies has proved to be detrimental to public distribution of safe tap water. The World Bank is approving loans to government entities which “explicitly require privatization of water provision.” This privatization is exactly what is happening in India today. In an article by Ann Ninan in April of 2003, she notes that "the modus operandi [in India] is clear -- neglect development of water resources [under World Bank budget austerity measures], claim a "resource crunch" and allow existing systems to deteriorate.”

Hussein Amery’s article, “Water Wars in the Middle East: a Looming Threat,” discusses a “nearly triggered” war between Lebanon and Israel in which water was the main topic. The author points out the high possibility of conflict and the possibility of

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10 Kirby
11 Barlow, Maude and Clarke, Tony. “Water Privatization: The World Bank's Latest Market Fantasy,” Polaris Institute, Ottawa, 2004
war in the Middle East because of the lack of water resources. In the end, if solutions are not met, the Middle East is looking at grim prospects for their political structure and stability.

**Yellow River**

China’s Yellow River is the main water supplier for China’s most important farming region, the North Plain area. The major problem with the Yellow River today is its rapid depletion, as it’s essentially emptying. Northern China is 2/3 crop land with only 1/5 of the nation’s water. This lack of water causes serious problems for the irrigation of crops as well as the basic problem of feeding China’s people. In 1997 the river ran dry for a total of 226 days. Since then the river has continued to run dry for about the same amount of time each year, if not longer. The fact that this happens every year, and is growing in time length with every coming year, is a great obstacle for the people of China to overcome. Despite the depletion of the River, farmers still pump water from the ground during these dry spells at an unstable rate. At this point, they are pumping more water from the ground than rain water is able to replenish. The underground water is used to produce 40% of China's overall grain; however, with the rate of pumping coupled with the lack of water from the river the people of China are in the process of creating a dependency on grain imports.

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14 Pearce.
Therefore, the culmination of these problems has forced farmers to wait until the end of each dry spell to continue farming with the constant fear of complete depletion with each new crop season. The postponed start of each season has brought a loss of both time and money to the farming community – two things that the Chinese farmers can not afford to lose.\textsuperscript{15}

**Aral Sea**

The Aral Sea in central Asia was once the fourth largest inland sea and one of the most fertile areas in the world. In the 1960’s, the Soviet Union re-routed the two rivers that lead to the sea – the Amu Darya and the Syr Darya – in order to create a cotton company. However, with the fall of the Soviet Union came the fall of the cotton mill.

Today, the Aral Sea is now essentially a toxic desert. Lethal chemicals have since soaked into the old sea bed and the air that blows over the toxic parts of the land carries the old chemicals into the towns. The areas around the Aral Sea have the highest infant mortality rate in the world due to the breathing of these toxic chemicals. The infected air gets into the lungs of the children and essentially kills the youth of the villages, children are normally the first victims because of lower immune systems and susceptibility to disease.

The Aral Sea was misused as an economic resource and, as a result, the people living in the area today are paying the price for the abuse decades ago. Had the Sea been used properly, with careful planning most of the problems that the area faces today could

\textsuperscript{15} *Kirby*
have been avoided. The Aral Sea is a perfect example from which to learn. It is essential for companies and countries to carefully plan out business ventures concerning water in any way, shape, or form. Irresponsible planning can yield unsafe and unclean products, as well as long term problems like those seen in the Aral Sea region.

**Niger River**

Statistically, more than half of the population in Africa does not have immediate access to any source of water. Currently, the only feasible solution to this problem is for women to walk miles a day to attain buckets of water. The water that these mothers, daughters, and sisters struggle to acquire on a daily basis is often times unsanitary water from a heavily polluted source. This unclean water leads to disease and death to many regions in Africa. A child dies every 15 seconds because of an easily preventable, water-related disease (diarrhea, dysentery, typhoid, cholera etc.).

The Niger River runs through West Africa and, like most rivers, is a major water source for surrounding countries. Ghana and Mali are known as “one-river” states because the Niger River is their only real source of water. Both of these countries’ fortunes rise and fall with the flow of the river. Ghana, for example, is completely reliant on the hydro-electric power of the River. Mali, one of the poorest countries in the world today, depends on the river for food, water, and transportation. Despite Ghana and Mali’s dependence on the River, the water’s pollution levels are high due its use for sewage. However, because it is the only source within reasonable distance, the people of

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16 *Kirby*

17 *Kirby*
Ghana and Mali are forced to use it for their primary water needs – despite the fact that diseases stemming from the water are killing off much of their populations.

**Turkish Conflict**

There are some nations that do not have the problem of sanitation, but of mere access. Turkey is now using water as a political tool against the people of Iran and Syria. The Turkish government is accused of “stealing” water from the Tigris and Euphrates Rivers by building a series of dams that stop some of the flow to Syria and Iran. This construction project is known as the Southeastern Anatolia Project. The diagram below is a map of the Anatolia Project (Diagram 1).

The Southeastern Anatolia Project is a project aimed at eliminating regional disparities for the people of Southeastern Anatolia. The idea is to raise people’s income
levels and living standards to ensure a better quality of life for locals. However, the
collection of dams in order to accomplish this is what is hurting the water supply of
Syria and Iran.

Today, the major debate in the Middle East is about whether access to water is a
human right. If so, the main question is whether it’s legal for Turkey to keep that access
from the people of Iran and Syria. However, Turkey has vowed that it will not cut off the
water supply to Iran and Syria, but the idea that Turkey could cut off water supply to
these two countries is the current problem of this area.

**Mexico City**

Mexico City has no adequate drainage system and no real filtration system;
therefore, the best way for the city to provide water to its citizens is through the pumping
of groundwater. Much of the water is being pumped from below the foundation, leading
the city to face a sinking problem. Without immediate remedies for Mexico City, the
government is going to be confronted with a major structural construction project.

Only 9% of Mexico City’s streams and rivers are fit for drinking. Due to the lack
of adequate drainage systems, the clean rainwater is mixed with sewage and used for
irrigation creating pollution at the drinking water level, as well as the crop level. It is
obvious that the combination of human excrement and rainwater used for irrigation is
extremely unhealthy and has led to a number of diseases.

In addition, 40% of the city’s water is lost through leaky pipes throughout its
pipeline system. This loss is a common problem throughout the world, but not to the
extent at which Mexico City is facing today. Hundreds of gallons of water could be saved per day if these leaky pipes were fixed and properly installed in the future.\textsuperscript{18}

\textbf{Catalonia, Spain}

The decision to use groundwater (water below the surface of the ground) or surface water (water on the surface of the Earth – this includes rain water) is a difficult choice for today’s developed-nations. Each has its own pros and cons as well as maintenance and extraction costs. Traditionally, Europe has opted to use groundwater as its chief water source. In fact, half of the cities in Europe run off groundwater extraction methods. However, each of these cities is using the groundwater at an unsustainable rate.

In Catalonia, Spain, 4.5 million people are affected because of a lack of water. Authorities are so desperate they are trying to create a pipeline system to divert water from the Rhone River in France to Barcelona so that water is available for those who do not currently have it. Presently, the Spanish government has planned to take the excess rain from the rain drenched areas of Spain and move it to the areas that are less fortunate. It may seem that these areas are scarce; however, they actually cover about 60\% of Spain. It was only until this issue came to rise that Europe realized that the World Water Crisis was not solely an issue in under-developed nations.\textsuperscript{19}

\begin{flushright}
\textsuperscript{18} \textit{Kirby} \\
\textsuperscript{19} \textit{Kirby}
\end{flushright}
United States of America

Finally, 95% of the USA’s fresh water is underground in the Ogallala Aquifer, also known as the High Plains Aquifer. An aquifer is a great pool of water trapped anywhere from 50 to 500 feet underground between sand and gravel layers. The Ogallala Aquifer, located beneath the Great Plains, is about 800 miles long (174,000 mi²) and covers eight states: South Dakota, Nebraska, Wyoming, Colorado, Kansas, Oklahoma, New Mexico, and Texas (as shown in Diagram 2). The Aquifer feeds about 27% of the irrigated land in the United States as well as providing 82% of the drinking water for the people living above on this water source.

The Aquifer, being one of the largest in the world, has fostered a sense of security in Americans about their water supply. This sense of security has led thousands of Americans to freely pump water from the ground at unsustainable rates. They are pumping so fast that the rainwater cannot replenish what is taken from the ground, a common problem for the “pumping” method. This is the same problem that Mexico City is facing. What Americans do not realize is that the Aquifer is depleting at a rate of 12 billion cubic meters (bcm) per year. The total depletion to date is about 325 bcm, this volume is the equivalent to the annual flow of 18 Colorado Rivers!

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21 Kirby
Author Martin Lewis notes that the world is facing an era of “global ignorance” where not only are American high school students completely devoid of global awareness, but scholars of globalization, strangely, are as well. Lewis finds it important to point out that the level of ignorance in our country is unbearably high, people are concerned with their own lives and have a strong tendency to ignore the world just outside their own sphere.\(^{22}\) If Americans were more knowledgeable about their overuse (see Diagram 3, the average daily use of water in the United States as opposed to other nations)\(^{23}\) of the Aquifer and its depletion, it’s possible that the United States’ crisis could be less extreme than that of Mexico City’s, Catalonia, Spain’s, and Africa’s.

However, the “global ignorance” that Lewis discusses would have to be eliminated for tangible solutions to come to the forefront.


\(^{23}\) http://www.ec.gc.ca/WATER/images/manage/use/a4f4e-sm-rev.gif
PROBLEMS STEMMING FROM THE WWC

By looking at these problem areas is it easy to see that a lack of access to fresh water can lead to a number of larger problems. Resulting issues are seen in possibilities of war, as seen with the Nile River basin issue between Egypt, Ethiopia, and Tanzania as well as the Southeastern Anatolia Project in Turkey (at the very least this issue can be categorized as a political conflict)\(^\text{24}\) as well as poverty, pollution and, as always, an increasing death rate.

Additionally, river water depletion is a major problem stemming from the crisis as seen in the Hindu River, Ogallala Aquifer, and Yellow River. The Yellow River is also facing job loss in the grain sector because of the drying up of its water ("economists say that by 2025, water scarcity will cut global food production by more than the current U.S. grain harvest.")\(^\text{25}\) China is not the only nation feeling the affects on the grain industry.

The Aral Sea, once the source of economic tyranny, is now essentially a toxic wasteland providing nothing more than death and disease to the people residing in its surrounding areas. The Aral Sea is the perfect example to show the fatal repercussions of a tyrannical and corrupt government. There are governments today that are unstable and are using water as either a political tool for election or a tool of war; depriving people of basic needs such as food and water is, without doubt, an effective tool for coercion and egoist-political gusto.


\(^\text{25}\) Pearce.
The unhealthy dependency of the people of Ghana and Mali on the flow of the Niger River is yet another issue - the fact that if anything were to happen to the river affecting its flow, the nations of Ghana and Mail would be in a state of complete economic disarray. The inward collapse of a nation because of lack of access to water, while frightening, is a realistic idea.

Finally, pollution is the key issue in most of the cases propelling the water crisis. Water borne diseases such as diarrhea, typhoid, dysentery, and cholera are responsible for 80% of deaths around the world. While pollution is a main issue in the continuing of the crisis, it may be the one issue that is the most easy to solve; in most cases if people stopped using the water sources as a depository for waste (human or other) the pollution issues would be on a healthy path toward its extinction.

Mark Lvovitch, author of “World Water Resources: Present and Future,” discusses the importance of paying attention to how much waste we, as human beings, pump into rivers and lakes. This pollution attributes to dangerous sanitation issues and limits the amount of water for human and animal consumption. If this pollution does not stop, the world population is looking at not just a water crisis but an array of diseases that can each be traced back to the unsanitary conditions in our local rivers and lakes.26

These problems listed are ones that are specific to each of the problem areas discussed in this thesis. However, there are other issues that arise in more developed nations – nations where water is more accessible. One issue that has come to the forefront of water-related conflict is the idea of water privatization.

“A handful of global corporations including Suez, Veolia, Bechtel-United Utilities, Thames Water and Germany’s RWE-AG are

acquiring control and ownership over public water utilities and waste management. Suez and Veolia hold about 70 percent of the privatized water systems Worldwide.”

In Vandana Shiva book entitled “Water Wars” she discusses “nine principles undermining water democracy.” Two of the nine principles discuss how water privatization blatantly conflicts with water democracy.

“Water must be free for sustenance needs. Since nature gives water to us free of cost, buying and selling it for profit violates our inherent right to nature's gift and denies the poor of their human rights.”

Raising water prices to benefit the water companies creates unnecessary disparities between rich and poor; it is one thing to live in two different neighborhoods depending on income levels, but tampering with prices on something as basic as water is pure, unaltered greed. Activists for the dissolution of the crisis are fighting to remove ownership of water from private companies and place that responsibility in more worthy hands (whether that be a responsible government or other organization, that depends on the country).

Additionally, there is popularity today in the discussion on global warming. The climate is changing and human beings are not sure whether we are the cause of the change or if it’s a natural cycle the Earth has yet to undergo until now. Either way, Charles J. Vörösmarty’s article on global water resources discusses the fact that, scientifically, the world is facing a much greater obstacle with the world water crisis than

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global warming. Statistically, human beings today are definitely going to feel the affects of the world water crisis themselves, whereas the serious affects of the global warming issue will come at a later date with a later generation. Vörösmarty specifically notes that almost every part of the world is facing this crisis today, both developed and underdeveloped nations, and that by 2025 the water crisis is going to put such a heavy burden on the backs of human beings that it will be hard to sustain ourselves.\textsuperscript{30}

The culmination of these issues should be enough to force the citizens of the world into a steady and strong protest of water waste and an even stronger stand to governments to help create solutions to remedy this crisis immediately. The fact of the matter is, if we start today we can make a difference in the crisis – we can save water by taking shorter showers, not watering our lawn as frequently or providing rain buckets for those in need in African villages. Action is necessary for the cessation of the crisis at every level.

TAKING ACTION

The United Nations Environmental Program’s (UNEP) mission is “to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.”31 It was their duty, therefore, in 1999, to inform the world community of the water crisis facing its citizens. UNEP gathered a group of 200 scientists from 50 countries in 1999 and declared that: “Water shortage is one of the two most worrisome problems of the millennium.” The other problem, naturally, was the Global Warming crisis. To this report, the UN responded by adding the fight against the World Water Crisis as a goal in their Millennium Development Goals (MDG) at the turn of the century.

The water crisis goal can be found under the “Ensure Environmental Stability” section and its objective is to “reduce by half the proportion of people without sustainable access to safe drinking water by 2015.” However, upon further research of this goal, it was soon recognized that there was a bigger issue facing those who did not have access to fresh water. This issue was not only could these people not get to a water source, but when and if they did, it was extremely polluted with human waste and common trash. Therefore, at the World Summit meeting in Johannesburg in 2002, two more goals were added to the current water-related MDG. One, to aim to develop integrated water

resource management and water efficiency plans by 2005 and two, to halve, by 2015, the proportion of people who do not have access to basic sanitation.

As the problem and its solutions have progressed in the last years, the United Nations General Assembly, in December 2003, proclaimed the years 2005 to 2015 as the International Decade for Action 'Water for Life'. The primary goal of this Decade for Action is to create awareness and commitments to the abolition of the WWC and WWC-related issues. The ‘Water for Life’ campaign is also going to follow the objective set forth by the MDG – to halve the amount of people without sustainable access to safe drinking water and sanitation. An office was created in Zaragoza, Spain on October 5, 2007 to help propel the goals of the International Decade for Action ‘Water for Life’ campaign. Managed by the United Nations Department of Economic and Social Affairs (UN DESA), the office will work on the necessities related to the success of the UN water MDG, with special focus on the crucial areas of today. The office plans to keep both these goals in mind as well as a continuation of the MDG in everyday life. These would include raising awareness of challenges associated with the WWC as well as sincere efforts to meet the end goals of MDG.

“The new office will contribute to meeting the “Water for Life” Decade’s goals by promoting greater interaction between governments, UN agencies and non-UN partners to deliver a coordinated response; mobilizing resources, partners and other stakeholders; promoting and encouraging partnerships at all levels; and ensuring coherence between the implementation of the water and sanitation agenda and other development goals.”

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In order for the Decade of Action to work, it was necessary for the UN to focus its attention on some of the most problematic areas concerning the WWC. As previously stated, almost every nation in this world is feeling the affects of the WWC, but some more than others. One of the biggest problem areas of today is Africa. With this focus in mind, the African Water Development Report was released in 2006. This report stated that “we can use water to help eradicate poverty, reduce water-related diseases and achieve sustainable development” and it provides tools necessary for this said eradication of the WWC in Africa as well as offering guidelines to ensure the success of this goal. Today, the report is used as a management tool for policy-makers to follow. According to the report, if these guidelines are followed through in the policies of certain Africa country legislations, then safe drinking water will be provided.

Several ‘celebrities,’ both in Hollywood as well as in the political arena, have taken it upon themselves to spread the news about the WWC to those who will listen. In early August 2006, Secretary-General Kofi Annan joined Def Jam President and CEO Jay-Z and MTV President Christina Norman and met with several UN agencies at the UN headquarters in New York to start their campaign on the WWC. Rapper Jay-Z created a documentary (Diary of Jay-Z: Water for Life) during his music tour to the Middle East and other areas heavily affected by the WWC. The series then ran on MTV to open the eyes of the youth in the United States (and all other nations that get the MTV Channel) to the problems associated with the WWC.


In December 2006, the UN General Assembly has declared that 2008 will be the International Year of Sanitation with the “overall objective of accelerating progress on sanitation to help save lives and foster economic and social development.” Sanitation is a touchy subject for not only underdeveloped countries, but developed ones as well. The lack of safe sanitation can lead to illness, malnutrition, and eventually death. Therefore, it was important for the UN General Assembly to recognize this “silent crisis” in its peak. The year of 2008 was dedicated as the year of sanitation; however, the battle had already begun before this year. The global sanitation level had become much higher, having increased from 49 percent to 59 percent between the years of 1990 and 2004 and over one billion people have improved sanitation conditions in the last 14 years. The publication of the MDG’s and their focus on safe drinking water and sanitation helped the situation by bringing a sense of awareness to the global community. However, the world is still not on the right track to meeting the MDG’s end goal. If the world continues at the pace they are now, there will still be 2.4 billion people without basic sanitation in 2015. Children are the main group feeling the affects of this problem. They catch many of the basic diseases that are associated with a lack of sanitation. An estimated 1.5 million children die each year due to poor sanitation, hygiene and unsafe water. Despite the astronomical number of child deaths, one can stay relatively “optimistic” (for lack of a better word) over this issue when analyzing both short and long term solutions.

In the fall of 2007, the United Nations Council on Human Rights held a press conference to discuss the problems facing the world today regarding the World Water

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Crisis, as well as the obstacles in the path of the Millennium Development Goal concerning water. Several sub-committees gathered at this press meeting as well as representatives from various countries. According to the press release:

“The Council [had] before it the report of the United Nations High Commissioner for Human Rights on the scope and content of the relevant human rights obligations related to equitable access to safe drinking water and sanitation under international human rights instruments (A/HRC/6/3), which says that human rights obligations in relation to access to safe drinking water and sanitation can be derived from various treaties, notably the International Covenant on Civil and Political Rights.”

This report was the basis for the discussion at the conference, allowing each member a say in the conversation (each nation-state is being affected by the WWC on some level, and, therefore, it was important for each country to be heard so that both problems and solutions could begin to be established). According to the press release from the conference:

“The UN Committee on Economic, Social and Cultural Rights had confirmed that there were existing human rights obligations emanating from the right to safe drinking water and sanitation and stressed that the right entitled everyone to sufficient, safe and accessible drinking water.”

While it might have taken a while for major organizations such as the UN to comprehend, this quote shows that major players in human rights legislation have come to the realization that water should be a human right. In addition, other comments were made at the conference that shed new light on the ongoing conversation regarding the WWC. For example:

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“The issue of the follow-through on the Millennium Development Goals was raised by another delegate, who said that efforts made in all areas of development since 2000 were inadequate.”

This quote sums up the issue that is facing the UN right now. They are well behind their goal in reducing (by half) the number of people without sustainable access to safe drinking water by the year 2015.

As previously stated, everyone present at the conference had a say at some point during the debate. Some of the comments made were:

“RAJIV CHANDER (India) said with regards to the report on access to safe drinking water and sanitation, the study appropriately limited its scope to access to safe drinking water and sanitation, which should be the focus from the human rights perspective; it should steer clear of areas which were beyond the ambit of the Human Rights Council. The study confirmed that drinking water and sanitation needs should be the first charge on any available water resources. States should work towards ensuring everyone’s access to a sufficient amount of safe drinking water. It was up to each country to determine what this amount was. The strategy for the progressive realization of this basic need should be based on national perspectives.”

“REINHARD SCHWEPPE (Germany) said the report on equitable access to safe drinking water and sanitation addressed a fundamental subject of ever increasing relevance. More than 1 billion people did not have access to safe drinking water and 2.5 billion had no provision for sanitation. … Germany and Spain were lobbying for realization of this right and believed the issue needed more consideration and clarification, together with stronger normative foundations. They planned to present a draft decision calling on all States to give due attention to the report.”

“ARJAN HAMBURGER (Netherlands) said the report on the scope and content of the human rights obligations related to equitable access to safe drinking water and sanitation provided a clear presentation of human rights obligations under international human rights law … Creating clarity facilitated recognition of access to safe drinking water and sanitation as a human right. The Council should continue to consider this issue: further elaboration and debate was needed. The identification of good practices could be of instrumental value, as they would foster a
better understanding of the right to water and concrete steps towards realizing access to safe drinking water for everyone.”

“MUSTAFIZUR RAHMAN (Bangladesh) said that access to safe water was a fundamental right of humankind. The right to water was even more basic than other human rights. It was imperative to develop water strategies, while preserving the ecosystem. Water was a scarce resource which had to be used in an equitable matter. All people had the right to access to sufficient water in order for them to meet their essential needs.”

“DAVID TAKACS, of International Environmental Law Research Centre, said every nation should develop legislation on safe drinking water and sanitation. Among other things, such legislation should aim at preventing discrimination in the face of access to water, whether it be provided by public or by private actors. Free basic water was a goal towards which all countries should strive.”

“SIMLA OZKAYA (Turkey) said that the report on safe drinking water and sanitation was a valuable contribution to meeting the Millennium Development Goals. Water and sanitation still were not available to the poorest people of the world, and consumption was on the increase worldwide. Water was at the core of sustainable development and its rational and equitable management was crucial for human survival. As the United Nations Development Programme’s Development Report 2006 had pointed out, pricing, investment and service delivery were important aspects of the issue. National governments bore primary responsibility for providing water to their citizens. Rights to water included a right to access at an affordable price to safe drinking water and sanitation. It was a challenging task to implement the right to water in a trans-boundary context and a "one-size fits all" approach would not be applicable.”

“LOURDES BONE (Uruguay) said the unrestricted access to drinking water and other water sources was a fundamental human right, an essential good which had immediate repercussions on health, sanitation and the environment, and thus the quality of life. Uruguayan society had understood that indiscriminate access to water was part of the national being and identity…”

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It is important to hear all of these arguments because it is crucial to know that there are people in the UN who are truly focused on the betterment of the WWC. These arguments are evidence that there are people currently in power who are fighting for an end to the WWC. While the changes the UN has tried to put into place are hard to detect, these quotes are material proof there are people who are trying to implement those changes. These people are forcing others to take a serious look at the problems that the world is facing now, as well as those greater problems that the world will be facing in the years to come.
SOLUTIONS

To help solve the WWC certain solutions, both long and short term, have been debated and some solutions have been implemented in various regions. Proper investigation of several remedies for individual areas is necessary in discovering what “works best,” somewhat of a trial-and-error period. Re-evaluation of current systems is also necessary because the small changes installed in those systems could save mass amounts of water yearly. Therefore, compiling a list of the current and future possibilities for crisis solutions is essential.

The idea of installing irrigation systems which drip water directly onto plants, as opposed to a “pouring” of water onto the crops, is one major solution with both economic and environmental benefits. Precision sprinklers tie into this irrigation system as they would allow for less water to be used with the same product-outcome as current watering methods.

Desalinization is one of the most accepted solutions of today; however, it tends to be very costly. Desalinization (through osmosis) refers to several processes that remove salt and other excess minerals from water to ensure it is safe and nutritional for drinking. When part of the salt is removed, the water can be used for irrigation or for animal consumption. If almost all of the salt from the water is removed, it is safe for human beings to drink. Desalinization systems are already used today in countries in the Middle East. For example, Saudi Arabia’s desalinization system accounts for almost 24% of the world’s capacity. The world’s largest desalinization system is in the United Arab Emirates. This facility is capable of 300 million cubic meters of water per day. As a
byproduct, most desalinization plants make table salt. While desalinization systems will work for any region, coastal regions will have the most beneficial outcomes from a system such as this.

Another solution, more long term than short term, is the creation of new water storage systems. Currently, in rural places with low to no access to water, there are no water storage systems in place. It would be necessary to ensure that clean water would be placed into these units because the purpose of the storage system would be defeated if unclean water was used. However, the placement of these storage systems would allow the mobility of water from the source closer to the villages. In an ideal world, collectively nation in Africa, for example, could poll money to create desalinization systems on the coastal regions and part of the water from these systems could be transported to landlocked nation through the use of water storage systems.

Fred Pearce, one of the leading researchers on the crisis today, notes that the solution to the crisis will come not in the construction of massive dams and a collection of endless reservoirs, but more fundamentally through an efficient plan that falls in line with the natural water cycle. It is important to keep in mind the consumers of this water cycle and that the mass public should be receiving the resource, not just a select few as happens too often today. Additionally, the revenue generated should not be filtered to the few but rather the source itself. This way, the water cycle and its effective implementation is sustainable.\(^{38}\)

Finally, everyday conservation and general awareness of the World Water Crisis is essential. The average American family uses 260 gallons of water in the home per day. If every one of these households had a faucet that dripped once each second, then 928

\(^{38}\) *Pearce.*
million gallons of water would leak away. One flush of the toilet uses six and a half gallons of water a day and a five minute shower uses about twenty gallons of water. With information such as this, it is hard to turn a blind eye to the excessive use of water by Americans. Multiply the water Americans use by all the other developed nations in the world and the water usage is astronomical. The only answer is to get the word out about the crisis and couple that with its solutions. There are a number of ways in which to present this information to the public that will result in a drop in the United States’ overconsumption. The information can be spread in any form from simply flyers on college campuses, to lesson plan units in local school systems, to political movements. Important to note is the fact that high school and college aged students have been the front runners in the Green movements that have cropped up over the last decades. By putting this information in their hands positive and exponential change could come to the immediate aide of this crisis.

Water is one of the most valuable resources on this planet and is something that cannot be replaced once it is lost. The World Water Crisis is a problem that is affecting every person in every nation today. The crisis grows day by day and people die every second because of it; therefore, it is necessary to take immediate action. The citizens of the world need to take a stand against the World Water Crisis before it is too late and in order for that stand to happen a general acknowledgement of the issue needs to take place. Once this acknowledgement has occurred, people can move in the direction of positive progress, something that is essential for the cultivation and sustainment of future generations.
CONCLUSION/PERSONAL OPINION

The World Water Crisis has been the invisible crisis to developed nations for decades now. It is evident that hundreds of thousands of people around the world are unaware of the current problems and those larger problems that are coming our way. It is vital to let the world know about this crisis and that the responsibility of ending the crisis falls on the shoulders of every person in our global community. National and multi-national organizations such as the United Nations must come to the aide of individual efforts to end the crisis. By broadcast the horrors of the crisis and the dark outcomes that are approaching, there is hope for an end to this problem.

The United Nations was founded with specific focus on peace and security, economic and social development, human rights, humanitarian affairs, and international law. The WWC is one that easily fits into all of these categories. It should be on the top of every list of the major Committees in each of these groups. To those of us who are passionate about the crisis, it was moving to learn that the UN had created MDG’s and Councils for the betterment of human rights with particular focus on the Crisis, yet each year frustrations are on the rise as the result of each council is the same – we still have a crisis and human rights are still being violated. Lives are lost every day because of either a lack of access to drinking water in general or access to a filthy, disease-ridden water source.

In America our problem is not a lack of access yet, rather our current overconsumption is what is leading us into limited access. To put the fault on the backs of every American is dramatic as the real issue lies in our general ignorance – most
Americans are simply unaware that we are headed right into this crisis. By discussing the crisis and its solutions to students at the most basic levels (elementary, middle and high school students), we can plant the seed of conservation in their minds to carry with them for their entire lives.

Water is necessary for life and it is the responsibility of those who can help to take the necessary precautions and actions to reduce the risks of a more dramatic crisis in the near future. By reaching out into our communities, local and global, we can stop a crisis that is ballooning exponentially and, in turn, save the lives of millions and ensure the security of generations to come.
METHODOLOGY

Our global community is faced with a number of environmental issues today. From global warming, to pollution, to the depletion of natural resources, our world is in the wake of an environmental transformation that will change the way we live forever. The water crisis is no exception to these changes. From my review of the current literature on the water crisis, I came up with an interactive research plan that I hoped would be able to shed light on the necessary actions and precautions to take in my community to avoid furthering this crisis.

The most simple and effective solution I found through my research was everyday conservation on the part of the individual. Therefore, I decided to reach out to the Providence community to get the word out about conservation and its positive impact on the crisis. Choosing to use the Providence School District as my community partner was an obvious choice, as much of my research pointed to younger generations’ success in being active in Green Movements such as water conservation and local foods movements. I wanted to know if a community that is not yet affected by the crisis can change to better prepare itself for the future. To do this, I went to three high schools in the greater Providence area to discuss the reality of the crisis and easy tips to save water. Here I wanted to learn whether or not a water conservation lecture on the realities of the crisis would make high school aged children in my immediate community be interested in making a difference. Would they change their lifestyles once they learned how their water habits are affecting and will affect them in the coming years?
Elayna Tekle and I went to three different schools in Providence: North Providence High school, LaSalle Academy, and the Moses Brown School. North Providence, the first school I visited, is a public school; LaSalle Academy is a private Catholic school; and, the Moses Brown School is a private school with a special environmental program emphasis. The Moses Brown School’s highlight on the environment allowed for an incredibly interesting and focused conversation on the water crisis and its solutions. In each of these school’s we were asked to present in either a Natural Science class or an Environmental science class. These classes provided the ideal mindset for discussion on environmental issues. The students watched a video on the water crisis then did an activity on their daily, monthly and yearly water consumption. As if the video and activity were not enough of a shock, we had the students compare their water use to that of an average third-world village’s consumption.

In addition to our lectures in these three schools, Elayna and I were in contact with Running Dry program director Jim Thebaut throughout the course of the semester. He was the creator of the video “Running Dry” that we showed at the high schools. Running Dry is a public awareness program based out of California that focuses on the water crisis locally in California as well as the global community. Through phone conversations and email, he provided us with a series of effective lesson plans that we used in the classrooms. His expertise in the water crisis education field is unmatched and his help was invaluable.

The “Findings” and “Conclusion” sections of this thesis will discuss the effectiveness of our Action-based research. We chose to participate in an Action-based methodology plan as we found it important to actually participate in water conservation
ourselves as well as getting students the essential information about the crisis and its practical solutions for their everyday life and those solutions at the national and global levels.
FINDINGS

Upon the review of the literature and the introduction of a community engaged aspect, I decided the most profitable form of research would be presenting the realities of the crisis to high school aged students. Each school presented a different “type” of student and subsequently variety of different reactions. For my own personal satisfaction, I wrote a reaction paper to each class and noted the positives and negatives about the lesson itself.

As stated in the following reaction papers, at the end of the class I handed out an evaluation-type form to the students to get their feedback about the presentation and the crisis in general. To accurately review the findings of each lesson taught, I have gone back to those evaluations and my reaction papers for comments that stuck out. I used the evaluations for this Findings section because, for the most part, the water usage charts for each school showed that the average water consumption for individual students was relatively close in gallons. This proved that the general overuse is prevalent at each social-economic level.

The following pages are a conclusion of each individual school. I begin with a copy of my personal reaction paper that I wrote after the class then the general findings from the evaluation sheets in addition to my experience during the lecture. The first school is North Providence High School, then LaSalle Academy, and finally, the Moses Brown School. The last section is my thesis conclusion which will present the culmination of my findings in addition to the summary of my thesis.
Reaction: North Providence High School

While searching for schools to lecture at, Elayna and I noticed that there are a number of different “kinds” of schools in the Providence area (public, private, and alternative). With this knowledge, we decided it would be beneficial to our theses to speak to one school in each of these categories. North Providence High School was the public school that allowed us to come in for a lecture on the crisis. The head of the science department, Mr. Sera, set Elayna and I up with a Natural Science classroom on March, 2009.

We’d planned a lesson ahead of time to ensure that our time was used efficiently. With only about 50 minutes, we had to somewhat “cram” the information into the allotted time. Our lesson plan was as follows:

- Introduce ourselves and why we are here.
- Introduce our theses on the crisis and the plan for the class.
- Show the “Running Dry” video.
- Discuss video.
- Hand out water usage chart for students to fill out. The students will estimate how many times a week they performed activities such as washing hands, taking a shower or bath, doing the dishes by hand or by the dishwasher, doing laundry, flushing a toilet etc.
- Have students guess how many gallons, on average, each of these activities takes. Once they guess each of these, we will give the students the correct answers so that they can add up their weekly usage to find how many gallons they use in one week. Dividing by seven will give the students their average consumption for one day.
- Discuss reactions to water consumption and answer any questions.
- Hand out “water fact” sheet and “ways to conserve water” sheet.

Our lesson plan was incredibly successful at North Providence High School as the students reactions were exactly what we wanted. They were surprised and shocked at not
only the water crisis itself, but at their overconsumption. They had a few interesting responses to the video and were surprised by the amount of water each activity takes.

The lecture at North Providence High School proved that the combination of our lesson plan, the information at hand, and our activities were successful tools in teaching about the water crisis. We were nervous as to how the presentation would go as because we’d never had to lecture about anything prior to this thesis. However, some of the comments from the students showed us that they had taken our information to heart.
Findings: North Providence High School

North Providence High School was our first school that we lectured at. We added the evaluation component after North Providence because we discovered that a student reflection section would be beneficial to our presentation and, thus, our thesis. However, I am relatively certain that a student reflection section would have done little at North Providence. The students were not nearly as engaged as those at LaSalle Academy and Moses Brown. Their comments were more on the defensive (i.e. “It’s not my fault that I was born in America”).

To their credit, however, they were the youngest group of students we talked to and they were in a General/Natural Science class as opposed to the Environmental Science classes we spoke to at LaSalle Academy and Moses Brown. These were the only two explanations we found to be solid. The introduction of the public vs. private vs. alternatives schools is one that could be argued, but would require more research.

There were quotes from some students that stuck out during the class though:
“I guess I don’t really need three showers a day. I can’t believe that a shower uses that much water.”
“I’m going to tell my mom to wash dishes by hand and to only do the laundry when the washer is full.”
“It makes me sick how much water I use.”

It was clear, despite the lack of hardy discussion, that the message of the severity got to the students. Thankfully, the real positive results would come from the students at LaSalle Academy and the Moses Brown School.
Reaction: LaSalle Academy

Our lesson plan for North Providence High School worked so well that we decided to use the same plan for LaSalle Academy. LaSalle was the private high school that allowed us to come speak about the crisis. The head of the Science Department at LaSalle Academy, Mrs. Martinelli, contacted Environmental Science teacher Sheena McGee-Flynn to see if she was interested in having us come speak to her students. Luckily, Mrs. McGee-Flynn’s Environmental Science class was currently working on water conservation and water testing at the time of our lecture and, therefore, was thrilled to have us come speak to her students.

The age group in Mrs. McGee-Flynn’s class was older than North Providence and the class was an Environmental Science class so the lecture went more smoothly than at North Providence. Because the students were already learning about water, their mindset was perfect for absorbing the information we were presenting. Subsequently, the lecture at LaSalle was more fruitful than at North Providence.

We followed the same lesson plan with one addition to the end of the presentation. We added a four question evaluation for the students to fill out. The questions were: 1.) Were you aware of the World Water Crisis before this presentation?; 2.) What was something interesting that you learned about the Water Crisis?; 3.) Do you think that our global community can go on living the way we do today without changing our lifestyles
with regard to water?; and 4.) Are you willing to be a part of the solution, and if so, how?.
The answers to these questions can be found in the Appendix of this thesis.

Additionally, we found that the average water consumption of the students at LaSalle was about the same as that of North Providence High School. The range of gallon use per week and per day was drastic in both schools. Students, if they answered honestly and to the best of their knowledge, used anywhere from a mere 45 gallons a day (well below the 80-100 American national average) to 200+ gallons a day, well above the national average. At LaSalle, the reactions were much the same as those in North Providence High School. The students, and teacher, were shocked at the video presentation as well as the amount of gallons used for each activity. All in all, the discussion at LaSalle Academy was lively and interesting. The student reactions were exactly what we’d hoped for and the presentation was a success.
Findings: LaSalle Academy

As my reaction paper states, LaSalle Academy’s class was very attentive and interested. The lesson plan that we used (the video, activity, and discussion) brought positive comments to the evaluations. Some of these comments included:

In response to evaluation question number two (“what was something interesting you learned about the Water Crisis?):

“I can’t understand how only 1% of the world water can support the entire population.
“EVERYTHING. The video was perfect; full of information and painful imagery.”
“I didn’t realize how many people die. They statistics amazed me. It changed the way I view water and how I use it.”
“I didn’t realize how much water get contaminated in foreign countries. Hearing about China’s water pollution die to fecal matter and industrial waste was shocking. You’d think that since they are so technologically advanced they would be improving health standards.”

In response to question number three (“Do you think that our global community can go on living they way we do without changing our lifestyles with regard to water?”):

“It’s up to developed countries like our own to make big changes both in our own usage and helping spread ideas (concerning industry) to other developing countries.”
“If we keep living the way we do we will probably end up with close to nothing.”

“We need to reduce [water use] and put more effort into irrigation systems all over countries that need them.”

“There is absolutely no way we can continue to use water the way we do and expect that our lifestyles will sustain us for the years to come.”

“The distribution of water is so unbalanced. Every country ought to be able to have the necessary amount of water to survive.”

These quotes, among others showed us that the students really understood the seriousness of the water crisis – which was the essence of our CET project. We answered questions at the end of the presentation that provide that the students were genuinely interested in making a change in their lifestyles. Whether the discussion was more beneficial than North Providence because the students were older, in an Environmental Science class or because it was a private school we were unsure. However, we were happy with the evaluation and the discussion and we hope that succeeded by encouraging the students to alter their lifestyles with regard to water.
**Reaction: The Moses Brown School**

The lecture at the Moses Brown School was easily the most fruitful of the schools we visited. The Moses Brown School is an alternative school with a special programs emphasis – this means that students study what they appreciate and what they naturally can excel in. Therefore, a lecture in an Environmental Science class proved to be the ideal venue for an environmental-related crisis lecture.

We were in contract with Environmental Science teacher Rebekah Johnson about a lecture in her class. Much like LaSalle Academy, Mrs. Johnson’s class was starting a unit on water conservation – particularly local water programs. We followed the same lesson plan as our time at North Providence High School and LaSalle Academy. It may have been because of the environment in which these students are taught in (incredibly flexible and casual) but the students were very vocal with the reactions to the video. It was these types of reactions through our presentation we were hoping for.

The students and teacher ask several questions as the end of the presentation and were eager to learn more. They were interested in what local organizations we had come in contact with to further our research. Luckily, I had been in contact with a Rhode Island organization known as Clean Water Action and provided information to the students about water legislation currently presided over in the Rhode Island legislature.

For the first time in any of our presentations, the students took over the conversation. They were discussing the issue amongst themselves and many were more than shocked at their water consumption – they were almost angry with themselves.
Their reactions were ideal and we could not have asked for a more attentive, intellectually stimulated, and interested group of students.

**Findings: the Moses Brown School**

Not only was the class at Moses Brown fruitful in its discussion but the evaluations post-class were interesting and lively. The lecture itself went smoothly and the discussion after the video and activity sparked more questions than those of North Providence and LaSalle Academy combined. Additionally, the questions and comments were sound in intellectuality and were incredibly thought-provoking even to me, as someone who has done intensive research on the subject.

In my personal opinion, the reason the Moses Brown students were so interested and vocal was a direct result of their immediate academic surrounding. They are in a school with no bells, no real restrictions, a “social” period mid-day, and in an environment that rather than running on precise schedules, lets them leave 5 or 10 minutes early. They are totally immersed in a liberal and trusting community that has clearly produced outgoing and unique individuals. Furthermore, the fact that students are allowed to study whatever it is they want and will excel at is an exceptional tool of academic progress. This fact provided the ideal audience and stage for which to present our theses. Some of the quotations from the evaluations are as follows:

In response to evaluation question number two (“What was something interesting you learned about the Water Crisis?”):
“The United States seems to ignorantly use water when countries like Africa are really struggling. I mean I love how I live, but I guess we should use our water wisely so we don’t end up like some third world countries.”

“I couldn’t believe how many more extravagancies the U.S. has because of water when other countries barely have any.”

In response to question number three (“Do you think that our global community can go on living the way we do without changing our lifestyles with regard to water?”):

“I thought so, but obviously not because the crisis is so incredibly serious. We need to try and change one person at a time.”

“No way! The activity you had us do to explore our own daily water use was eye-opening. Society needs to change, structurally, to address the crisis.”

In response to question number four (“Are you willing to be a part of the solution and if so, how?”):

“Of course, I would feel selfish if not.”

“Yes! Change persona lifestyle, advocate and legislation!”

“Yes, trying [by] trying to reduce the amount of water that I use on a daily and weekly basis. I obviously use way too much water and need to try and stop using so much.”

Much like LaSalle Academy, the evaluations and post-class discussion proved that we had definitely gotten the message across to the students. We hope that they will
take the information we provided them and truly make a change in their lives to help their immediate communities as well as the global community.
CONCLUSION

Information is key to the development and positive progress of our global society. Through the research of this thesis it became painfully clear that the flow of information on the crisis has not yet reached its necessary peak. A thorough knowledge of how to handle a global crisis such as the water crisis is the foundation from which successful change can be made. Therefore, the role of education in our local communities has cropped up as one simple solution in preventing a greater crisis.

The review of the current literature shed light on the severity of the situation around the world. Several programs, international relief efforts, and policies have attempted to alleviate the crisis from a “top-down” approach. Thankfully, these top-down approaches have helped the regions greatly in need; however, they do little for developed nations like our own. I found the way to diminish the chances of a greater crisis in the future is through everyday conservation. I am quite certain that Catalonia, Spain would not be in its ruined state if they were previously aware of the long-term significance of personal conservation. Therefore, I decided it was imperative to take action – immediately. I was greeted with open arms by the Providence School District and their energy about wanting to learn about the crisis propelled my vigor for the subject. I went into each class excited about the idea that today I would be changing someone’s lifestyle with regard to water that would, hopefully, have a ripple effect to the rest of the community. The students’ reactions to the presentation strengthened the fact that the message had pulled on the stings of their hearts. I hope the students take with them a
piece of my passion for the water crisis and apply it to their lives – they will help more than they could ever understand.

Water is not a luxury, it’s a necessity and a resource that deserves to be appreciated and respected as we are nothing without it. The current crisis, while atrocious, is nothing compared to what we will experience in the coming years. Our local communities need to be prepared for a wave of the crisis that we are currently unprepared for and often times unaware of. The only ally we have in the fight against the crisis is the steady and strong flow of information. Information has changed the face of our world time and time again making it better with each change. Just as the notions of equality and freedom spread through the United States at her conception, just as the myths of AIDS and HIV were dispelled in the last decades, and just as the concept of Global Warming has rightfully come to the forefront of environmental conversation, we need the water crisis to be given its due rank in the dialogue of our world’s future problems. We can prevent this crisis from ruining the future of humanity and thus save millions of lives in the process. This may be seen as a choice now, but it will soon become a duty, consequently forcing our generation to carry the burden of explaining their appalling overconsumption to their thirsty and dying grandchildren.


Barlow, Maude and Clarke, Tony. “Water Privatization: The World Bank's Latest Market Fantasy,” Polaris Institute, Ottawa, 2004


PERSONAL WATER USAGE REALIZATION

Overview:

Students will be able to identify personal water usage and compare it to facts online at the USGS Water Science for Schools Web site (ga.water.usgs.gov/edu/).

Objectives:

• Students will collect and analyze their own water usage
• Students will construct a graph illustrating the distribution of their personal water usage
• Students will identify ways to conserve water
• Students will electronically visit Water Science for Schools and examine water data

Materials:

• Notebook/Paper
• Pencil
• Rulers
• Graph Paper
• Water Usage Chart for common activities
• Colored Pencils
• Computers

Background:

Personal water use on a daily basis is often underestimated. Creating an awareness of clean water usage and waste is critical in understanding conservation. Through personal situational use of water for one day and the average amount of water used in each activity, students will develop a conceptual framework for clean water.
WATER USAGE FOR COMMON ACTIVITIES

A typical person in an American household may use 80-100 gallons of water and include the following activities:

- Washing hands: .25 gallons
- Brushing teeth: 1 gallon
- Flushing toilet: 5 gallons
- Laundry: 30 gallons/load
- Showering: 30 gallons
- Taking a bath: 40 gallons
- Washing a car: 20 gallons
- Washing dishes (by hand): 10 gallons
- Washing dishes (with dishwasher): 240 gallons/30 minutes

(Add .05 gallons of water consumed through food and drink for the day)
ACTIVITY:  PART 1

1. Ask students why water is important. Is there enough water? How do we get the water we use? Brainstorm all the ways students use water each day and make a list on the board.

2. Estimate how many gallons of water students use each day. Each student should record his/her estimate in a science notebook.

3. Discuss student estimations.

4. Explain to students that they are going to keep a water usage log. Every time that they use water in the next 24 hours, they need to write it down. Students may construct a data table based on the class generated list to tally their usage, for example:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>NUMBER OF TIMES</th>
<th>GALLONS PER ACTIVITY</th>
<th>TOTAL GALLONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brushing Teeth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shower</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laundry</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACTIVITY: PART 2

1. Ask students to share their water usage data that they collected. Are there any patterns? Which activities did they do the most often?

2. Provide students with the average amount of water used for each activity. Students should calculate the number of total gallons used for each activity and then calculate the total number of gallons used in one day.

3. Construct a graph to illustrate the types of activities and the amount of water used for each. Analyze the information collected. What does it tell you about how you use water?

4. Share graphs. Discuss questions students have about water usage and list these on the board.

## Personal Usage Chart

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of times in past 7 days</th>
<th>Gallons Per Activity</th>
<th>Total Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing Hands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brushing Teeth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushing Toilet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laundry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking a Bath</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing a Car</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing dishes (by hand)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing dishes (dishwasher)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10 THINGS YOU DIDN’T KNOW ABOUT WATER

1. 75% of the Earth is covered with water. 97% of that water is in the oceans. Only 3% of Earth’s water can be used as drinking water. Of that 3%, 75% is frozen in the polar ice caps

2. 3.575 million people die each year from water-related disease

3. Every 15 seconds, a child dies from a water-related disease

4. 84% of water-related deaths are in children ages 0 - 14.

5. At any given time, half of the world's hospital beds are occupied by patients suffering from a water-related disease

6. The water and sanitation crisis claims more lives through disease than any war claims through guns.

7. Poor people living in the slums often pay 5-10 times more per liter of water than wealthy people living in the same city

8. The daily requirement for sanitation, bathing, and cooking needs, as well as for assuring survival, is about 13.2 gallons per person

9. It takes 2,072 gallons of water to make four new tires.

10. Without food a person can live for weeks, but without water you can expect to live only a few days.
TOP 10 WAYS TO SAVE WATER

According to Mono Lake Committee, here are the top ten ways to save water.

1. Water your lawn only when it needs it. Step on your grass. If it springs back, when you lift your foot, it doesn't need water. So set your sprinklers for more days in between watering. Saves **750-1,500 gallons** per month. Better yet, especially in times of drought, water with a hose. And best of all, convert your lawn to native plants.

2. Fix leaky faucets and plumbing joints. Saves **20 gallons** per day for every leak stopped.

3. Don't run the hose while washing your car. Use a bucket of water and a quick hose rinse at the end. Saves **150 gallons** each time. For a two-car family that’s **up to 1,200 gallons** a month.

4. Install water-saving shower heads or flow restrictors. Saves **500 to 800 gallons** per month.

5. Run only full loads in the washing machine and dishwasher. Saves **300 to 800 gallons** per month.

6. Shorten your showers. Even a one or two minute reduction can save up to **700 gallons** per month.

7. Use a broom instead of a hose to clean driveways and sidewalks. Saves **150 gallons** or more each time. At once a week, that’s more than **600 gallons** a month.

8. Don't use your toilet as an ashtray or wastebasket. Saves **400 to 600 gallons** per month.

9. Capture tap water. While you wait for hot water to come down the pipes, catch the flow in a watering can to use later on house plants or your garden. Saves **200 to 300 gallons** per month.

10. Don't water the sidewalks, driveway or gutter. Adjust your sprinklers so that water lands on your lawn or garden where it belongs--and only there. Saves **500 gallons** per month.
WHAT DID YOU LEARN?

1.) Were you aware of the World Water Crisis before this presentation?
________________________________________________________________________
________________________________________________________________________

2.) What was something interesting that you learned about the Water Crisis?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

4.) Are you willing to be a part of the solution, and if so, how?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of times in past 7 days</th>
<th>Gallons Per Activity</th>
<th>Total Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing dishes (dishwasher)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing dishes (by hand)</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing a Car</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking a bath</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showering</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laundry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushing Toilet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brushing Teeth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing Hands</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Gallons:**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of times in past 7 days</th>
<th>Gallons Per Activity</th>
<th>Total Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing dishes (dishwasher)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing dishes (by hand)</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing a Car</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking a bath</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showering</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laundry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushing Toilet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brushing Teeth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing Hands</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Total Gallons:**
<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of Times</th>
<th>Total Gallons Per Activity</th>
<th>Total Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing Dishes (by hand)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Washing Dishes (dishwasher)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Washing Car</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Washing Bath</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Washing Clothing</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Drying</td>
<td>60</td>
<td>60</td>
<td>360</td>
</tr>
<tr>
<td>Shaving Face</td>
<td>310</td>
<td>310</td>
<td>195</td>
</tr>
<tr>
<td>Shaving Hands</td>
<td>0.34</td>
<td>0.34</td>
<td>2.38</td>
</tr>
<tr>
<td>Shaving Teeth</td>
<td>0.25</td>
<td>0.25</td>
<td>1.75</td>
</tr>
<tr>
<td>Number of times in past 7 days</td>
<td>13.5</td>
<td>13.5</td>
<td>94.5</td>
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</table>

Water Usage
<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of times in past 7 days</th>
<th>Total Gallons Per Activity</th>
<th>Washing clothes (dryer)</th>
<th>Washing clothes (hand)</th>
<th>Watering plants</th>
<th>Taking a bath</th>
<th>Showers</th>
<th>Laundry</th>
<th>Flushing toilet</th>
<th>Brushing Teeth</th>
<th>Washing Hands</th>
</tr>
</thead>
<tbody>
<tr>
<td>240</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>15</td>
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<td>0</td>
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<td>1</td>
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<tr>
<td>80</td>
<td>2</td>
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<tr>
<td>120</td>
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<tr>
<td>10</td>
<td>4</td>
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<td>10</td>
<td>2</td>
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<tr>
<td>105</td>
<td>1</td>
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<tr>
<td>14</td>
<td>4</td>
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<tr>
<td>8.75</td>
<td>15</td>
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</tr>
</tbody>
</table>

Water Usage
### Water Usage

<table>
<thead>
<tr>
<th>Activity</th>
<th>Times per Day</th>
<th>Gallons Per Activity</th>
<th>Total Gallons</th>
<th>Days in Last Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dishes (dishwasher)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dishes (by hand)</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Car</td>
<td>0</td>
<td>20</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Bath</td>
<td>0</td>
<td>40</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>Vehicular water</td>
<td>20</td>
<td>30</td>
<td>600</td>
<td>0</td>
</tr>
<tr>
<td>Dry cleaning</td>
<td>120</td>
<td>30</td>
<td>360</td>
<td>0</td>
</tr>
<tr>
<td>Toilet</td>
<td>5</td>
<td>35</td>
<td>175</td>
<td>1</td>
</tr>
<tr>
<td>Teeth</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hands</td>
<td>5</td>
<td>35</td>
<td>175</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Gallons</strong></td>
<td></td>
<td></td>
<td><strong>875</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Document indicates a daily usage of 95 gallons, weekly usage of 677.75 gallons.
WHAT DID YOU LEARN?

1.) Were you aware of the World Water Crisis before this presentation?
   Yes, we started to learn about it in class recently.

2.) What was something interesting that you learned about the Water Crisis?
   I didn't realize how much water gets contaminated in foreign countries. Hearing about China's water pollution due to steel makers & industrial waste was shocking. You'd think that since they are so technologically advanced they would be upholding health standards.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
   There is absolutely no way we can continue to use water the way we do. I expect that our lifestyles will sustain us for a few years to come.

4.) Are you willing to be a part of the solution, and if so, how?
   Yes, I'm willing to cut down my shower times - it may be a little hard due to my long hair, but it needs to be done.
1.) Were you aware of the World Water Crisis before this presentation?
In other countries, and I wasn't aware it was so serious, as the presentation said.

2.) What was something interesting that you learned about the Water Crisis?
We get our veggies from California and we have a lot of water and they are in a serious crisis.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
I thought so, but after the presentation absolutely not because the crisis is so incredibly serious. We need to try and change one person at a time.

4.) Are you willing to be a part of the solution, and if so, how?
Yes, trying to reduce the amount of water that I use on a daily and weekly basis. I obviously use way too much water (850 gal./day) and need to try and stop using as much.
WHAT DID YOU LEARN?

1.) Were you aware of the World Water Crisis before this presentation?
Some what, I have to travel a lot so being to South Africa more than 10 times opens my eyes, and Asian countries. But I was not aware it was this bad.

2.) What was something interesting that you learned about the Water Crisis?
that the average person in the 3rd world countries use as much water/day that we use in one washing.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
Clearly not, seeing as it was mentioned before USA needs to find away to lessen the amount of water we use/day.

4.) Are you willing to be a part of the solution, and if so, how?
Of course, I would peel myself in not, I will be learning how to conserve water through everyday activities, such as finishing clothes' laundry etc. & telling other ppl about the issue.
WHAT DID YOU LEARN?

1.) Were you aware of the World Water Crisis before this presentation?
   I was not aware of the details and severity of the World Water Crisis, but I was aware that many countries suffer from a lack of water.

2.) What was something interesting that you learned about the Water Crisis?
   I learned that it was very interesting and sad to see how much of the world we have and how many more extravagances the U.S has because of water when other countries barely have any.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
   No, I don't. The exercise we did in class that showed us how many gallons I use a day showed me that our global community needs to limit the amount of water we use. I didn't think that I used an excessive amount of water but when I calculated it, I use 1271 gallons a week.

4.) Are you willing to be a part of the solution, and if so, how?
   I think that the World Water Crisis is extremely important. I am very willing to work to conserve the amount of water I use to help decrease the risk of running out of water.
WHAT DID YOU LEARN?

1.) Were you aware of the World Water Crisis before this presentation?
   Yes - we did a unit on "Global Environmental Science."
   - The water crisis/water issues

2.) What was something interesting that you learned about the Water Crisis?
   That the US is heading toward this crisis, too.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
   No way! The activity you had us do to explore our own daily water use was eye-opening. Society needs to change, structurally, to address the crisis.

4.) Are you willing to be a part of the solution, and if so, how?
   Yes! Change personal lifestyle, advocate legislation.
WHAT DID YOU LEARN?

1.) Were you aware of the World Water Crisis before this presentation?

I had a basic idea of the world's water condition, but didn't really click until I saw the film.

2.) What was something interesting that you learned about the Water Crisis?

That the United States seems to ignore the water crisis when countries like Africa are really struggling. I mean I can understand, but I guess we should use our water wisely so we don't end up like some third world countries.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?

I don't believe that just the US using a lot of water is the whole issue. I think that the countries struggling need to work on controlling their water use so they can use their water without losing it. I think if their sewage systems became more controlled then they could live a lot better.

4.) Are you willing to be a part of the solution, and if so, how?

Yes, I guess I could try and use water more efficiently throughout the day. Also letting others know of the issue.
WHAT DID YOU LEARN?

1.) Were you aware of the World Water Crisis before this presentation?
   Yes, because of the Environmental Science class.

2.) What was something interesting that you learned about the Water Crisis?
   Everything... the video was perfect, full of info and painful imagery.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
   No. It’s up to developed countries like our own to make big changes both in our own usage of water and spread ideas (concerning water) to other developed countries.

4.) Are you willing to be a part of the solution, and if so, how?
   I am willing to be part of the solution - I recently went vegan and when I get home I’ll find out if it would be more efficient to wash my dishes by hand and also cut down on the length of my showers.
1.) Were you aware of the World Water Crisis before this presentation?
   Yes.

2.) What was something interesting that you learned about the Water Crisis?
   The deprivation of water to other countries. The movie that was shown was great because it gives you facts and a visual that reading or lecturing couldn't show.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
   No, we need to reduce and put more effort into irrigation systems are over in countries that really need them.

4.) Are you willing to be a part of the solution, and if so, how?
   Yes, I will use less water in any way possible.
WHAT DID YOU LEARN?

1.) Were you aware of the World Water Crisis before this presentation?
   Yes, but I didn’t realize that it was really so widespread.

2.) What was something interesting that you learned about the Water Crisis?
   I learned how much a difference there was between our and other countries water consumption.

3.) Do you think that our global community can go on living the way we do today without changing our lifestyles with regard to water?
   I think there will be people who don’t change but there will definitely be consequences. If we keep living the way we do, we will probably end up with close to nothing.

4.) Are you willing to be a part of the solution, and if so, how?
   Yes, I will definitely try and take shorter showers and wear clothes more before I wash them. I do less laundry less often.