

YOUTH AND THE MOUNTAINS

Student Essays on Sustainable Mountain Development



Volume I
2013



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YOUTH AND THE MOUNTAINS

Student Essays on Sustainable Mountain Development

The following essays are on a variety of themes that relate to sustainable mountain development, both at home in Utah and around the world. They cover such varied topics as conflict in mountainous regions, alternative energy production, political arrangements, and the importance of women in mountainous communities. This volume includes essays that were written by students at Utah Valley University and also includes essays written by local high school students who competed in the Utah High School Essay contest, held in 2011, 2012 and 2013.



Table of Contents

Introduction: Dr. David Connelly.....1

Introductory Essay: “Sustainability of Prophetic Politics: Definition, Differentiae, and Deterrents to Sustainability in Societies”
Author: Luis Alfonso Miranda Perez.....5

SECTION I: MOUNTAIN ISSUES IN UTAH AND IN THE UNITED STATES

“Conflict in the State of Utah: A Survey of Conflict Among the Indigenous Paiutes and Modern Threats to State Security”
Author: John McClure.....17

“Mormon’s Political Challenges Settling in Utah”
Author: Jordan Giles.....29

“Consequences of Environmental Service Agreements in Wasatch County”
Author: Jordan Giles.....39

“Sustainable Mountain Development: State Rights vs. Federal Rights”
Author: Thomas Hone.....46

“American Attitudes towards the Global Warming Consensus”
Author: Gregory Haddock.....57

SECTION II: INTERNATIONAL MOUNTAIN ISSUES

“Mountain Conflicts: The Ferghana Valley”
Author: Alexis Sagen.....66

“An Andean Perspective”
 Author: Will Welch.....84

“Women of the Andes: How Secular Education Enhances Women’s
 Health and Society in General”
 Author: Jared Martin.....90

**SECTION III:
 UTAH HIGH SCHOOL ESSAY WINNERS**

2013 Winner:
 Maranda Fisher
 “Running Out of Water”.....103

2013 Second Place Winner:
 Quinn Everett
 “The Case against Water Contamination in Utah: The Hazardous
 Factors that Led to Pollution and the Poor Policies that Tolerate it”
109

2013 Third Place Winner:
 Maison Evensen
 “Water Rights and Preservation”.....116

2012 Winner:
 Justin Ngo
 “Wind Energy for Mountainous Regions”.....122

2012 Second Place Winner:
 Jacob Adler
 “Sustainable Energy Sources and Benefits of Thorium in Modern
 Society”.....126

2012 Third Place Winner:
 Amber Kelpacz
 “Micro-Hydro Power”.....132

2011 Winner:

Shelby Jorgensen

“Women’s Education in Mountainous Regions”137

2011 Second Place Winner:

Katie Pontsler

“Women of the Mountains: Past and Present: What Can We Learn From These Brave Souls?”142

2011 Third Place Winner:

Ivan Delgadillo

“The Benefits of Mountainous Communities Can Achieve Through Women and Education”146

Introduction

Whaia te iti kahurangi ki te tuahu koe me he maunga teitei.
Aim for the highest cloud so that if you miss it, you will hit
a lofty mountain. – Maori Proverb

Utah Valley University, its faculty and students have set high and lofty goals in the area of sustainable mountain development. Utah Valley University joined the United Nations-related Mountain Partnership in 2006 in an effort to reach out to other mountain communities; from the mountain community that Utah Valley University calls home to the mountain communities around the world in an effort to strengthen co-operation and understanding of the challenges and issues that are unique to mountain living. Since 2006 Utah Valley University has hosted three ‘Women of the Mountains’ conferences; two in Utah and one in Peru. We have also organized the ‘International Mountain Day’ three times in order to promote mountain issues in the state of Utah and beyond its borders. Utah Valley University also sent a delegation to the United Nations Conference on Sustainable Development (Rio +20) that was held in Rio de Janeiro in June of 2012. Utah Valley University faculty and students were able to contribute their thoughts and ideas to the final document of that conference as well as to the activities under the umbrella of the Third Global Meeting of the Mountain Partnership, which were held at the Mountain Pavilion during that time.

Mountain issues are of special importance to us as we call the mountains our home. Utah Valley University is nestled near the mountain range known as the Wasatch Front. These mountains have historic significance for all the people of this area. The mountains have been a source of life and renewal; first to the Native Americans who first inhabited this valley and then later to the Mormon pioneers who used the mountains as a source of water to irrigate this dry desert land and also as a natural defense against unfriendly armies who sought to push them out of the valley. Mountains have ever been an indelible part of Utah’s culture and identity.

Raising awareness of mountain issues and creating partnerships among mountain communities had been at the heart of

all of Utah Valley University's efforts as a member of the Mountain Partnership. These efforts have had a positive affect for all who become involved. Utah Valley University students who diligently work with their professors to achieve these goals find themselves a part of a global network of mountain communities; they have seen beyond the boundaries of their own mountains and gain an increased understanding of the world around them through firsthand experience. This firsthand experience is in keeping with the commitment to engaged learning that Utah Valley University strives for. While many undergraduate universities in North America learn about international diplomacy from books, Utah Valley University students have opportunities to learn about it from firsthand experience. And they even created a vehicle for that purpose by uniting in a coalition of several student clubs at Utah Valley University, named Utah International Mountain Forum (UIMF).

This volume is symbolic of the efforts of Utah Valley University and UIMF to raise its students as a new generation of leaders in advocacy of the United Nations-related sustainable mountain development (SMD) agenda within Utah and the region. It contains student essays that discuss the issues of SMD such as the environment protection, conflict resolution, and alternative energy use in the mountain regions, the need to constantly be listening to the prophetic voices among us, gender issues, and the benefits of governments working together for the good of the mountains.

In section I of this volume essays that related the mountain issues of Utah and the United States are considered. The conflicts of the early Mormon pioneers are discussed as well as their political challenges settling the Utah Valley. Governmental cooperation in sustaining mountain environments is also a focus on one of the papers.

Section II contains essays that discuss mountain issues in different parts of the globe such as the Ferghana Valley in the mountains of Central Asia and the Andes Mountains.

The final section highlights the successes that Utah Valley University and UIMF has had with the High School Essay contests with topic chosen to cover mountain issues designated by the United Nations for every year. The Utah Valley University High School Essay Contests began in 2011 to coincide with the

second Women of the Mountains International Conference that was held in Orem, Utah. High school students from around the Utah and Salt Lake Valleys were asked to submit essays on topics related to the event. As an established tradition to host those gathering annually, similar contests were held in 2012 and 2013.

Although, Utah Valley University's students efforts were overlooked in the United Nations Secretary General's (UNSG) report in 2013 on sustainable mountain development, nevertheless, we will continue to engage youth for the mountain cause advocacy both in the Rocky Mountain region and globally. We hope the publishing of our first volume of student essay's will be significant proof of the renewed efforts from Utah Valley University's students as a whole in achieving their goal to make a real difference in the lives of the local and international communities. The distribution of Volume I of Youth and the Mountains is scheduled for the 4th Global Meeting of the Mountain Partnership held in Erzurum, Turkey.

In attempting to change the world in this way Utah Valley University students are aiming for the clouds but if we miss, according to the proverb, we will hit the lofty mountains. The lofty mountains we call home.

David R. Connelly, Editor-in-Chief

Introductory Essay



Sustainability of Prophetic Politics Definition, Differentiae and Deterrents to Sustainability in Societies

By Luis Alfonso Miranda Pérez

Luis Alfonso Miranda Pérez is a recent graduate from Utah Valley University, who majored in Philosophy and minored in Peace and Justice Studies. He comes from a pragmatic background, having managed humanitarian efforts in Mexico and Central America, youth leadership projects in Czech Republic and the Netherlands, and a social enterprise in Japan. He has published and presented his research on the sustainability of democratic politics and peace. Pérez has recently completed the Peace Research program at the University of Oslo. He speaks English, Spanish, French, and Russian. Most recently, he served as the Co-Chair of the Student Leadership Group at the 1st Russian-American Youth Summit. Pérez intends to attend a premier foreign affairs or conflict transformation graduate program, as he is in the journey to become a peace mediator.

Although normally understood primarily as a theological notion, the prophetic is also political. Before introducing my argument, it is important that we know what the prophetic is, what its distinctions are, and clarify its notion. To provide context on the question I will pursue, I will introduce Brueggemann's views on the task of the prophetic. I will then follow by sharing the distinctions of the prophetic from Riemer. I will then solidify the concept and value of the prophetic and will afterwards introduce the question I seek to explore.

First, Brueggemann defines the task of the prophetic ministry as to cultivate and evoke a perception alternative to the consciousness of the dominant culture through criticizing and energizing the alternative community. Brueggemann believes the prophetic tradition began during the biblical times of the exodus of the Hebrews from the Pharaoh's Egypt, where Moses, a prophet, catalyzed an alternative perception and maintained an alternative community to challenge and inspire a partition from the dominant Egyptian community around them.¹ To fulfill the task of cultivating the alternative consciousness, prophets fill the role of critics and energizers. Prophets criticize to deconstruct the dominant consciousness.² Prophets bring into visibility the existence of a better future against the realities of the old order to energize.³

Second, Riemer makes the distinctions between the prophetic and the predictive, the apocalyptic, and the utopian. When talking about the prophetic, we are not necessarily speaking about predicting or forecasting the future. Rather, prophets are people who speak the words of God,

¹Brueggemann, Walter. *The Prophetic Imagination*, 2nd ed. Minneapolis: Fortress Press, 2001, 5.

²Ibid., 3.

³Ibid., 14.

provide constructive insights about the gap between ideals and reality, and demand a fulfillment of God's will. Similarly, secular prophets are people who believe in a set of superior universal values, criticize the failure to live by these values, and demand a redirection to live by them. The prophetic also isn't apocalyptic. The prophetic believes that it is in the power of the people to transform the world within a conventional or constitutional framework, unlike the apocalyptic which holds that people are insignificant in changing the course of humanity. Lastly, it is necessary to note the difference between the prophetic and the utopian. Whereas the utopian holds a belief that earthly salvation is attainable, the prophetic doesn't assume the possibility of being perfect, nevertheless, the prophetic strives for continuous improvement.⁴

Prophets are distinguishable characters. Prophets have a great sensitivity to evil. They have an uncanny ability to detect the intentions of peoples and policies. Prophets also give importance to the ordinary. They care about every action, emotion, or decision, as meager or as ample as it may be, as they see every single decision as elemental to achieving a grander change. Prophets are luminous and explosive. They are fearless to voice their opinions and are gifted in communicating and ingraining into people their vision about the status quo and the future. Prophets are also iconoclasts. They relentlessly seek to destroy the symbols of social and religious injustice. Prophets are austere compassionately. They are ascetics, dedicated to help humanity and to bring their prophetic vision to reality. Prophets are skilled or gifted in the use of moral persuasion. They are persuasive when voicing their vision of a moral living, efficient at making us feel morally deficient for our failure to do so, and compel us morally to change our way of living to accommodate a more just society. Prophets may be singular in ends, but different in means. They might share, more or less, the ideal of living in a morally just society, but they might differ in the moral means to achieve it. This means that there are different traditions of the prophetic. Jesus Christ, Wangari Maathai, Karl Marx, Mohandas Gandhi, Noam Chomsky, and Martin Luther King Jr. can be considered examples of prophetic people. The International Committee of the Red Cross, the International Labor Organization, the United Nations International Children's Emergency Fund, and African American Churches during the American civil rights movements could be considered examples of prophetic institutions.

For social, political, or economic change to come about there must be a prophetic voice. It is the prophetic voice that serves to disturb us out of our way of living and engage us in a moral companionship to transform

⁴Neil, Riemer. *Karl Marx and Prophetic Politics*. New York: Praeger, 1987, 2-3.

society. The prophetic serves as our society's consciousness. Without any moral consciousness in policy formulation and implementation, the peace of a society degrades.⁵ Lederach says that practical mechanisms similar to prophetic institutions are needed to define responses from crises in order to define the future instead of the crisis itself.⁶ Prophetic-like behavior is invaluable to continue to transform our societies and to foster peaceful cohabitation.⁷

From understanding the value of prophetic to societies and from witnessing the discontinuity in presence of prophetic traditions, two questions become attractive to inquisition: How do we attain a prophetic tradition and how do we sustain a prophetic tradition? For the purposes of this essay, I will explore the latter question with a more specific perspective. Although it is important to pursue an understanding of the methodology of attaining a prophetic culture in societies, it is also important to understand the issues surrounding the sustainability of a prophetic culture. I will thus attempt to identify the obstacles to sustaining a prophetic culture within a society. Societies in which people become either prohibited or antagonized to follow the four commitments of prophetic politics, due to the obstacles posed by the Royal Consciousness, will render their prophetic cultures volatile and unsustainable. To argue this conclusion, I will first explore the four major commitments of the prophetic politics according to Riemer, and afterwards engage the concept of Royal Consciousness, according to Brueggemann, by explaining how it is an obstacle to the sustainability of a prophetic culture. After that, I will defend my argument from a critique pertaining sustainability and attainability of prophetic movements, and I will finish by substantiating my claim through case studies with Mohandas Gandhi and Martin Luther King Jr.

We must understand the four major commitments of prophetic politics in order to grasp its relation to the King Consciousness. The four major commitments are: (1) to value a superior cosmopolitan order; (2) to social deductive analysis and indomitable criticism of all sociopolitical orders; (3) to innovative constitutional improvement; and (4) to constant prophetic scrutiny and visionary projections.⁸

⁵Oppenheim, Felix E. *The Place of Morality in Foreign Policy*. Lexington, MA: Lexington Books, 1991.

⁶Lederach, John Paul. *Building Peace: Sustainable Reconciliation in Divided Societies*. Washington DC: United States Institute of Peace, 1997, 79.

⁷MacNair, Rachel M. *The Psychology of Peace: An Introduction*. West Port, CT: Praeger, 2003, 141.

⁸Riemer, Neil. *Let Justice Roll: Prophetic Challenges in Religion, Politics, and Society*. Lanham, MD: Rowman & Littlefield Publishers, 1996, 5.

The first major commitment of the prophetic politics is to value of a superior cosmopolitan order. This means that the prophetic is committed to act upon values that are universally shared by everyone such as peace, love, human rights, social justice, ecological health, etc.⁹ This commitment establishes a set of universal ethics that require governance to be profitable for all humans.

The second major commitment of prophetic politics is to social deductive analysis and indomitable criticism of all sociopolitical orders. According to Riemer, “[a] sensitivity to the “least free” requires criticism of all political orders . . . in which the “least free” are struggling for emancipation and fulfillment.”¹⁰ To protect the “least free” that Riemer speaks of, the prophetic must investigate and analyze how the human condition is being affected by the status quo. This commitment seeks to dissect the current reality into such depth that it allows for scientific articulation of an alternative way to that of the dominant culture.

The third major commitment of prophetic politics is to innovative constitutional improvement. As we are faced with many complex problems, we require action that is creative, intelligent, and constitutional. The prophetic necessitates the belief that ideals are attainable. It is through covenantal or constitutional breakthroughs that the prophetic can cement progress in narrowing the gap between the prophetic paradigm and reality.¹¹

The fourth major commitment of the prophetic politics is to constant prophetic scrutiny and visionary projections. This commitment requires the prophetic to voice a projection of the moral world that the prophetic paradigm envisions. This projection links the present decisions and the future consequences as to achieve a moral accountability and to appeal to an excitement towards modeling a desirable future.¹²

The commitments of the prophetic, as described by Riemer, and the tasks of the prophetic, as described by Brueggemann, are implicitly related. The four major commitments represent the normative philosophy of the prophetic whereas the tasks of criticizing and energizing represent the applied philosophy of the prophetic. One is moral commitment and the other is moral action. The key to being prophetic is that a prophet must act upon the prophetic paradigm. When a prophetic paradigm is characterized by a commitment to a superior ethical order, the concrete coefficient is the cultivation of an alternative consciousness. Criticism with an objective to

⁹Ruener, 6.

¹⁰Ibid.

¹¹ Ibid., 7.

¹²Ibid., 8.

create a counterculture from a dominant culture requires a commitment to indomitable criticism of that dominant culture. The prophetic commitment of innovative constitutional improvements guides the conscious liberation from the dominant consciousness. Without the moral persuasion of visionary projections, it is impossible to energize people into becoming part of the alternative community.

A prophetic culture allows for alternative communities to be cultivated. Both applied theory, meaning the prophetic tasks of criticizing and energizing, and normative theory, meaning the four major commitments of the prophetic politics, are necessary to help develop and sustain the counterculture. The greatest obstacle in being able to sustain a prophetic culture is the presence of the Royal Consciousness. Biblically, the Royal Consciousness is the historical program with which Solomon dismantled the Mosaic prophetic tradition.¹³ For our purposes it is equivalently the sociological, political, economic inverse function of the prophetic mode. The Royal Consciousness served to dismantle the alternative and prophetic consciousness behind the Mosaic, pre-Solomon Hebrew society.¹⁴ I will explain how the three dimensions of the Royal Consciousness affect the applied and the normative sustainability of the prophetic. I will proceed by articulating on the dimensions of Economics of Affluence, Oppressive Social Policy, and Static Religion and their relation as obstacles to the sustainability of prophetic cultures in societies.

When a society is affected by the Economics of Affluence, an obstacle to the prophetic tasks is posed. "It is difficult to keep a revolution of freedom and justice under way when there is satiation."¹⁵ Scarcity is the insufficiency that causes a psychological tickling of the curiosity of individuals to change something in their behavior to achieve sufficiency. Scarcity is the uncomfortable tension that happens when someone feels that their condition does not do justice to them, and this very creative tension drives them to pursue ways of achieving justice for their conditions.¹⁶ The prophetic seeks to find and recognize these insufficiencies or scarcities, make them visible, and this very act energizes people to change their behavior. Scarcity, the opposite condition of affluence, is the fuel that energizes prophetic movements. It is logical, thus, that if the absence of scarcity, meaning affluence, is to be present in the consciousness of a soci-

¹³Brueggeman, 25.

¹⁴Ibid.

¹⁵Brueggeman, 26.

¹⁶King, Martin Luther, Jr. *I Have a Dream: Writings and Speeches that Changed the World*, ed. By James Melvin. New York: Harper Collins, 1992, 87.

ety, then people would feel less energized to be part of a counterculture, a resistance culture that requires energy to continue. A condition that Brueggemann suggests is that affluence is malign when it isn't democratically distributed.¹⁷ Say we have two sectors of society. The first sector happens to be the prosperous minority and also in power in respect to policy formulation. The second sector happens to be the destitute majority and without representation in respect to policy formulation. If prosperous, would the first sector be easily compelled to change policy to suit for the justice of all, if their needs are already met and the accommodation would likely mean a return to scarcity? It is logical to conjecture that the prosperous sector wouldn't be as motivated to bring about superior justice as they would be if they were living under more scarce conditions. When affluence is present in the consciousness, people feel less compelled to engage in a prophetic movement. Any movement requires the use of energy, and if the supply of energy is not continuous, then the movement will become unsustainable and volatile.

The presence of affluence doesn't signify the death of action, but it is likely to distort the moral compass behind the decision of an action. Affluence doesn't mean that people won't make decisions. People make decisions whether to do things, or not to do things. To decide, one must act according with their morality. The moral compass of a prophetic decision is characterized by the four commitments of the prophetic politics. When affluence is present in the consciousness, it distorts the person's ability to make judgments cohesive with the prophetic paradigm. According to sociological research, there is a relation between making moral decisions and the self-concept of the person making the decision. People generally evaluate who they are, and their relationship with others while making moral decisions.¹⁸ The relationship between affluence and the normatively prophetic is that when people under an affluent condition are to make moral decisions, and they evaluate their self-concept against their status of affluence, it is less likely that they will commit to prophetic action. An interesting biblical example that was posed by Brueggemann when he commented on his model is the example of the Biblical Solomonic society. He says that the prophetic commitments, inherited from the Mosaic tradition promoted the idea of taking seriously the needs over their fellow beings, were replaced by consuming-based priority in the affluent Solomonic society. This changed the attitudes within the population; it encouraged objectifying their fellow beings as products to be used rather than fellow

¹⁷Brueggeman, 26.

¹⁸Turner, R. H. "Self and Other in Moral Judgment." *American Sociological Review*, 19, no. 3 (June 1954): 249-259, 258.

people to be taken care of. Sustainability of a prophetic culture is difficult according to Brueggemann in this sort of society where consuming is the priority.¹⁹

Oppressive Social Policy is the foundation of the systematic restriction of prophetic discourse. Freedom is the societal pillar through which many prophetic traditions and their respective societies can develop, as suggested by prophetic paradigms of the likes of Marx,²⁰ King,²¹ Gandhi,²² and West.²³ Some prophets disagree on how to attain that freedom, whether by coercion, in the case of Marx²⁴ or moral persuasion, in the case of Gandhi²⁵ and King.²⁶ Nevertheless, in order to criticize or energize, the prophetic action requires some sort of freedom to be able to fulfill its commitments to indomitable criticism of all sociopolitical orders. The task of criticizing is implicitly interwoven with the task of energizing, and the systematic oppression of one is inherently of the other.

Rather, what the Oppressive Social Policy endeavors to do is halt any possibility counter movements, and reallocate, through policy formulation, the energy of the oppressed into the support of the continuous undemocratic affluent state. During the early history of the United States of America, African Americans were forced into slavery. Even though the conventional values of the foundation of the country were said to advocate that all men were created equal, these values were proven to be misnomers to the cause of championing of equality and democracy towards all, regardless of race. In regards to policy, constitutionally speaking, an African American was considered three fifths of a citizen in representation.²⁷ Nevertheless, the unprophetic system of slavery was still the rule and the cotton industry continued to enrich the dominant white population. Anyone who dared to question, criticize, or create a consciousness alternative to the status quo, was punished. Take the creation of the slave codes in the state of Georgia in 1858 which handed anything from fines, to incar-

¹⁹Brueggeman, 200. 27.

²⁰Rierner, *Karl Marx and Prophetic Politics*, 26-29.

²¹King, 109.

²²Gandhi, Mahatma. *The Essential Gandhi: An Anthology of his Writings on His Life, Work, and Ideas*, ed. by Louis Fischer. New York: Vintage Books, 1983,192.

²³West, Cornel. *Prophesy Delivrance!: An Afro-American Revolutionary Christianity*. Anniversary edition. Louisville, KY: Westminster John Knox Press,2002, 8-9.

²⁴Rierner. *Karl Marx and Prophetic Politics*,86.

²⁵Gandhi, 79.

²⁶King, 30-31.

²⁷US Constitution. Art I, Sec 2.

ceration, for assembling, to prohibition of teaching, reading, or writing to any slaves.²⁸ West explains this to be a natural reaction of the Royal Consciousness. Every system of domination, in any aspect of society, fears the presence of the prophetic and will seek to extinguish it.²⁹ The danger that Oppressive Social Policy poses is that it tends to occlude the path of the free development of the prophetic. Where the prophetic commitment to innovative constitutional developments meets the dominant-culture's denial to negotiate, the prohibition of discourse that is characteristically prophetic is found. If a society lacks any sort of fundamental protection from the systematic prohibition posed by Oppressive Social Policy towards the prophetic, then their prophetic cultures will become weak and unsustainable.

The establishment of a Static Religion poses the issue of blind patriotism. Although Brueggemann thinks that the Economics of Affluence and the Oppressive Social Policy were the greatest nullifiers of the alternative community of Moses, he asserts that the achievement wasn't made without a theological endorsement of the society. This theological endorsement was part of Brueggeman's theological dimension of the Static Religion which meant the establishment of a King-regulated accessibility to God.³⁰ The psycho-political equivalent to Static Religion is the concept of blind patriotism. Characterized by subjective positive analysis, never ailing allegiance, and intolerance to prophetic criticism, blind patriotism is an inflexible favorable attitude towards the state.³¹ Blind patriotism is a state of consciousness in which a sentimental and uncritical abandonment of constructive political engagement happens and the decision making is sanctioned by the elite of the society. Admittedly, blind patriotism is the conscious effect of the sociopolitical presence of Static Religion. When in the presence of Static Religion, people surrender their ability to make personal judgments which simultaneously relinquishes their ability to be characteristically prophetic. It would be illogical to assume that one can continue to be prophetic if one refuses to honestly recognize the faults in the dominant consciousness and commit to remedy these faults, even if it means to stand in full opposition of the much idolized dominant consciousness. As a Machiavellian reaction, Static Religion antagonizes criticism.²⁸Wilson, Edward G. *A Digest of all the Ordinances of the City of Savannah, and Various Laws of the State of Georgia, Relative to Said City, Which Were of Force on the 1st January 1858...* Savannah,: John M. Cooper & Co.,182.

²⁹West.

³⁰Brueggeman, 28-31.

³¹Schatz, Robert T., Ervin Staub, and Howard Lavine. "On the Varieties of National Attachment: Blind versus Constructive Patriotism." *Political Psychology*, 20, no.1 (March 1999): 151-174.

cal attitudes toward their institutional protégé.

A clear case study can be done with the Muslim-Hindu affairs during the period of the liberation of India. Gandhi advocated for an immediate commencement of reconciliation between Hindus and Muslims. However, the opposing parties, being statically religious to their movements, became uncritical of themselves, which led them to engage in a viciously violent and competitive relationship. Gandhi, a vocal supporter of unity and justice between Hindus and Muslims in India was seen as a threat to the patriotic attitudes of the Hindu Nationalist. Soon after the partition of India, Gandhi was assassinated at the hands of Nathuram Godse under the premise that Gandhi was appeasing Muslims at the expense of Hindus.³² Today, we have an India and a Pakistan who have gone through three major wars, one minor war, and have seen themselves at the edge of nuclear war in a few occasions. The Indo-Pakistani relations have not yet achieved a sustainable peace in the region. The prophetic movement that sought unification and peace amongst people has since then almost extinguished. When Static Religion is present in a society, its phenomena is antagonizing and its consequence to the prophetic is that it renders it unsustainable and more volatile.

Alternative cultures need to be cultivated. They are living and learning social organisms. Prophetic movements grow and shrink. They are born and some of them die. Their niche is to catalyze just and peaceful societies. In order for the prophetic sustain its task of criticizing and energizing, there must be a freedom in its society to pursue the prophetic paradigm. I have presented here the obstacles to fulfilling those tasks in the matter of the three dimension of the Royal Consciousness. If prophetic movements aren't protected against the Royal Consciousness, they become hindered in the presence of affluence, prohibited in the presence of socially oppressive policy, and antagonized in the presence of state idolatry. They encounter difficulty, become volatile, and are eventually rendered unsustainable.

This is not to say that prophetic cultures can't be born in the presence of the Royal Consciousness. Gandhi began his liberation movement from imperial Britain in South Africa, after a first class privilege was denied in a train, and a small group of people decided to meet to talk and begin to plant a dissenting seed that grew into a larger scale movement that gave birth to more critically prophetic institutions like the *Indian Opinion* and the South African Indian Congress.³³ Martin Luther King Jr. joined a Civil Rights movement that was growing from a decade before. What

³² Gandhi, 307-321.

³³ Gandhi, 31-75.

made King monumentally influential was his way of energizing the alternative community to a stratum so unprecedented, that for the first time, the African American counterculture was so relevant that the dominant consciousness could not ignore it. If no injustices are present, the prophetic would not be present. It is necessary for injustice or oppression to exist in order for the prophetic to come into practice. Therefore, my argument about sustainability is not meant to answer the question of how to attain prophetic cultures. Having in mind, however, the delicate necessities in cultivating an alternative consciousness in a society, and the effects of unadulterated exposure to Royal Consciousness, leads us to conclude that the prophetic isn't sustainable if it isn't being protected.

I offer no guidelines of protection of the prophetic. Constructively, the dire question that follows is: Where can we learn how to protect prophetic cultures from unsustainability? If one is to accept that the prophetic and the counter-prophetic to be a philosophical discipline of the that exists only outside of our senses, or that they are metaphysical in that only a transcendental presence can provide us with an understanding of them, then such question begs a theological response, and risks never to be answered under present social scientific methods. However, from my perspective, the prophetic and the counter prophetic are phenomena that are economic, political, and sociological in nature. This means that the discipline of the prophetic is empirical, methodological, and tangibly palpable. If such, then we can say that in order to understand how to move away from unsustainability, the answer will reside in a holistic approach in policy, attitudinal formulation, and implementation in the fields of social, political, and economic science. And yet, even though I accept the prophetic and the counter-prophetic to be empirical, I can't deny the profound personal sentiment that that the prophetic is nonetheless transcendently cosmic and divine.

Section I:

Mountain Issues in Utah and In the United States



Conflict in the State of Utah: A Survey of Conflict Among the Indigenous Paiutes and Modern Threats to State Security

By John McClure

John McClure is an honors graduate of Utah Valley University. He received his bachelor of arts in International Relations. During his time at Utah Valley University, McClure led seven different campus organizations in efforts regarding sustainable mountain development, political engagement, and student government. He has been published several times on topics of conflict in mountain regions and terrorism. He has also taken part in global efforts in Sustainable Mountain Development and International Security including the Rio+20 Global Conference in Brazil as well as the Stanford University US/Russia Forum in Moscow. McClure is currently attending graduate school at the University of St. Andrews in Scotland. He is earning a master's degree in Terrorism and Security Studies from the oldest and one of the most prestigious programs in the world. After graduation, McClure is eager to begin work in the field toward the study and prevention of terrorism as well as aspects of diplomacy and the relevance of regional conflict to sustainable development.

Conflict is a term often used synonymously with mountainous regions. The most numerous conflicts in the world occur within mountain zones.¹ Upon recognition that conflict is predominantly a mountain issue, it is important to identify both the factors that cause conflict, and the factors that exacerbate conflict in mountain regions and amongst mountain people. Primary factors that cause conflict in mountain regions include: isolation, governmental oppression, and the threat of emerging statehood, the last being the major cause of regional conflict within mountain zones. The underlying factors that add to the rise of conflict in mountain regions are: ineffective governance, poor resource management, and the rise of communications.² These factors both primary and underlying lead to various types of conflict and consequences that have long term effects on mountain people.

This research will underline key issues of conflict within the state of Utah; beginning with its initial development as a state and concluding with pressing issues that face the state today. Key elements of root conflict, and insights into conflict prevention will also be addressed. Evidence will be provided to show that conflict in Utah historically stems from the same catalysts of conflict as in other mountain societies, and that through research of past issues of conflict within the state of Utah, regional experts are able to provide information that directly leads to best practices in conflict resolution.

Paiute Conflict with a Eurocentric Settlement

¹ Starr, Frederick. *Key Issues for Mountain Areas*. editors Martin Price, et al. United Nations University Press, 169.

² *Ibid.*, 170-173.

Within Utah's history of conflict regarding mountain people, the Paiute tribe has undergone many of the textbook elements that create and exacerbate conflict within their mountainous regions. The primary issue that has created conflict within this indigenous people is the threat of an emerging state and its accompanying governmental oppression. The underlying issues that exacerbate this conflict are resource management and isolation. As late as the mid nineteenth century, the southern Paiutes were primarily a hunter-gatherer society who also relied on small-scale horticulture. The Paiutes planted and irrigated gardens of corn, beans, and squash next to permanent sources of water.³ In the 1850s the Mormon Church, which was centralized in Salt Lake City, organized colonies of settlers to be dispatched and ordered to build communities next to virtually all water sources in the Paiute inhabited country.

Over the next sixty years, the Mormon settlers appropriated the Paiute land and assumed control of the most precious resource available to the indigenous people: water. Within this span of six decades, the Paiutes were successfully conquered and relegated to four small tracts of land. These mountain people were subject to isolation and removed from access to their natural resources, both of which are underlying sources of conflict that arise from the primary source of an emerging state.⁴

During the first ten years of Paiute/ Mormon interaction, there was competition for resources in the region. These two ethnic groups freely contended to limit the other's access to water sources. In the early stages of Mormon community development, there were power struggles and imbalances. Over time, the Mormons signed peace treaties with neighboring allies of the Paiutes, limiting their ability to garner strength in numbers and effectively limiting their chances of regaining their territory by force. In the ensuing years, the Mormons monopolized Paiute land and resources by overwhelming not only the Paiutes, but their aboriginal competitors. This severely limited the adaptive capabilities of the Paiutes to the new Eurocentric culture, and represented an effort by the Mormon settlers to establish a territory of their own through the exploitation of both natural resources and those currently in possession of them.⁵ Such actions embody another subcategory of conflict causation: the natural resource diversion by an external entity within a community of mountain dwellers without

³ Evans, Michael J., and Stoffle, Richard W. "Resource Competition and Population Change: A Kaibab Paiute Ethnohistorical Case" *The American Society for Ethnohistory*, 23, no. 2 (Spring 1976): 173-197, 175-176.

⁴ *Ibid.*, 181-182.

⁵ Evans, 183-186.

proper compensation.⁶

Having identified the factors that caused conflict among the Paiutes in the nascent stages of the Eurocentric settlements, it is important to address the consequences and cases that have arisen from this governmental oppression and its road to a new statehood. In doing this it will be necessary to identify the main contributing factors to conflict, which are: resources being diverted from mountain people, isolation, and ineffective governance.

The first case of consequence is the diversion of natural resources from the Paiutes. In past research on conflict in the mountain regions it is stated that the most conflict prone communities are those that export natural resources without the ability to purchase essential goods and services in return. In the case of the Paiutes, they are no exception. Irrigation ditches dug by Mormon settlers diverted water away from their streams which not only fed the fields in which their livestock grazed, but also gave life to their summer food supply of grass and grains.⁷ Through this exploitation of the Paiutes resources, and the lack of compensation, they were almost immediately forced into dependency and wage labor to the very people who took their resources from them. Between 1926 and 1980, 80 percent of Paiutes in the state of Utah lived on land that was controlled either directly or indirectly by the Mormon Church. This indigenous mountain people of Utah were successfully conquered and their resources effortlessly taken from them without compensation, and all without warfare or treaties. It is important to note that within mountain communities, conflict does not always manifest itself in the form of violence or warfare. And in the case of the Paiutes, the manifestation was the condemnation of a mountain people by sending out their most precious resource without compensation.⁸

The next case of consequence is the isolation of the Paiutes. Isolation is traditionally a source of conflict within mountain communities that causes dislocation and a psychology of victimhood among its people. In the case of the Paiutes, they are no exception. Having been removed from their land and culture, which was developed through centuries of mountain living, the Paiutes were dislocated and effectively became wards of the state government.⁹ The Paiutes were scattered across the state into

⁶ Starr, 172.

⁷Knack, Martha C. "Church and State in the History of Southern Paiutes in Cedar City, Utah." *Journal of California and Great Basin Anthropology*. 19, no. 2 (1997): 159-178, 159.

⁸Ibid.

⁹Ibid., 161.

small reservations that were sometimes devoid of natural resources and had very minimal attachment to the modern world. Because of this, it was not uncommon for the tribe to often migrate from reservation to reservation in order to survive. A diaspora of the Paiute tribes were created as such.¹⁰

The last case of consequence involving the Paiutes is the ineffective governance from the emerging state. In a region of Utah where the former indigenous people were forced under sectarian control, these people were not provided adequate representation within the new emerging governmental body. Throughout the 19th century and into the 20th century, the Paiutes were governed by Mormon land owners and by the Bureau of Indian Affairs (BIA). Neither of these organizations enforced the First Amendment rights of freedom of religious practices, and even when the Native American Religious Freedoms Act was enacted, rights of these mountain people were never protected from the imposition of an established religion. The result of this lack of representation and ineffective governance had severe repercussions on the Paiutes. Aside from the scattered land that was afforded the Paiutes, their dependency on the settlers for employment of labor rapidly drove them into poverty, which lasted well into the 1970s.¹¹

After decades of government neglect, it had finally been recognized that the Paiutes were not benefitting from life under these conditions, and that the issues resulting from the extended hand of the state government were perpetuating the conflict within this indigenous tribe. The US government resolved to allocate funds from the federal poverty program and divert as many Paiutes away from the organized structure of the Mormon Church. Though the government tried to preserve this mountainous people, several factors still worked against the Paiute Tribe. The ownership of the land previously inhabited by the Paiute, now owned by the Church, complicated aspects of the Paiutes life. Their legal standing, access to housing, economic welfare, and access to health care were all jeopardized due to state governance.¹²

The history of this conflict among the Paiutes in the state of Utah has great relevance to issues in mountain communities around the world. Through research, certain methods of conflict prevention and best practices can be derived from a history of conflict causing catalysts, and ineffective governance. In a sense, over the span of two centuries, we can effectively surmise what to avoid in a situation of an emerging government

¹⁰ Evans, 191.

¹¹Knack, 169-172.

¹²Ibid., 172-173.

cohabiting with an indigenous mountain people. The information gathered over time and the research that has since ensued is also indispensable to the derivation of best practices that can be applied to the preservation of mountain people, their culture, and way of life. These practices include the implementation of methods that have already proven themselves, such as: traditional means already employed by mountain people themselves; address security issues and social/economic problems together, not separately; scale initiatives to the actual needs of the people; actively engage the mountain community as participants and not merely as welfare recipients; and to embrace the private sector while simultaneously trying to maintain a connection to traditional cultures.¹³

There are a number of solutions that can be applied to help prevent situations of conflict. First, it is important to monitor social as well as economic conditions. Social and economic conditions exist in parallel with each other and cannot be effectively ascertained for means of research if not compared in accordance with each other. In the case of the Paiutes, economic conditions were not taken into consideration. While social aspects were assessed (the transition of an indigenous way of life into a semi-subservient labor ready workforce for the new colonists), the economic conditions in which they lived were not taken into account and often neglected when transitioning them into a way of life which was foreign to their own.

The second practice is the implementation of methods that have already proven themselves, and to actively engage the mountain community as participants and not merely as welfare recipients. In the case of the Paiutes, the culture of a hunter-gatherer society should have been maintained and integrated into the lifestyles of the burgeoning colonists that were creating new communities and changing the culture and way of life in the region. Had the Paiutes been able to continue to cultivate the land and provide resources not only for the new inhabitants, but continue to hold to the culture that had sustained them for generations prior, the integration of the Paiutes would have had a much smoother and cohesive integration into a more modern society. If this practice had taken place, rather than usurping the Paiute water supply, supplanting the deep rooted culture, and decreasing the independence of an indigenous people, the avoidance of driving mountain people into poverty could have been averted by including them in the decision making and governing of the community. This would have also allowed for the Paiutes to maintain a firm hold on their culture as opposed to a sharp transition into poverty and a life of labor foreign to a mountain people.

¹³Starr, 177-179.

These practices all tie into the last implementation, which is the scaling of initiatives to meet the actual needs of the mountain people. In the case of the Paiutes/Mormon conflict, the initiatives of the Mormon settlers were to move south within the Utah territory, occupy land, and assume control of the most valuable resources in the region. In doing so, they forced an entire mountain population to impoverishment and dependency, and nearly eradicated a culture and a way of life. If the initiative had been scaled to meet the needs of the indigenous people, for example; integration of the Paiutes into the settlers initiatives by offering fair compensation for the resources used, or the employment of the Paiutes' capabilities in the field of horticulture, then a culture could have been better preserved and the independence of a mountain people may have been maintained.

Through the research of peace and conflict in the mountain regions, we can adequately gather information that will benefit the mountain community as a whole. Through the implementation of best practices, the way of life that has become important to mountain people, of who comprise 24 percent of the global population, can be preserved and may continue to successfully integrate into a changing society. Resources that are the driving force for mountain people remain a valuable asset and not a plunder for the extended hand of emerging governments.

Conflict in Utah Today

As Utah enters a new century, the Native American residents are still faced with adversity that has been caused by emerging governments. What was once an emerging government is no longer in its seminal stages, and the once aboriginal dwellers of Utah are now commingled with generations upon generations of Utah inhabitants who face very real conflict on a regular basis. While the natives continue to struggle with an underrepresentation and are laden with a indigence that is seemingly unshakable, those existing spawn of the original Eurocentric colonizers face new threats from surrounding entities as well as international organizations who seek to disrupt their way of life.

Threats to the Original Mountain People

Modern threats to the Native Americans of Utah have ultimately been caused from a transition of control to dependency. Having been placed on reservations with lackluster governmental assistance, a culture that once thrived is now on the fringe. Without any structured or organized oversight for these reservation communities, gaming and internal corruption have continued to slow the progress of the Utah Native American as well as further aid to their indigent existence.¹⁴

¹⁴Sanders, Sgt. Drew. Interview. West Jordan Police Department, West Jordan, Utah. May 15, 2012.

In the case of the Utah Native Americans, the missing link in the process to rescue the ailing society is adequate representation within the Utah legislature. As it is now, there is not one Native American representative in the Utah House or Senate. This speaks volumes for the amount of political activity amongst the Native Americans of Utah. Not only are the indigenous tribes of the state left out of the political process, but the lack of interest in state governance is continuing to subdue this fledgling demographic. Until there is the desire for political involvement and integration from within Utah's Native American population as well as an adequate representation in the Utah House, this problem will only perpetuate.

Conflict and Threats to the Modern Indigenous of Utah as a Whole

In the case of the majority population of Utah residents, new issues in conflict have arisen within its mountain communities. These issues include drug trafficking and the new presence of foreign drug cartels, gang activity, radical movements and militias, terrorist threats, and a sudden trend toward extreme racial and cultural diversity. Though these current issues in Utah differ from those dealt with by the aboriginal and the early euro American settlers, these issues of conflict all stem from similar seeds of conflict.

Drug Trafficking and Foreign Cartels

In the case of the rise of drug use, drug trafficking and the resurgence of foreign led cartels; these issues all arise from one of the leading causes of conflict within mountain zones, that of international support and funding. International support and funding relates to the issue of either a secular or religious movement, which seeks to mobilize the poor, or oppressed within a region or community and create a radical movement or illegal operation for a means to survive. This includes drug production, drug trafficking, and cartel activity by a people for means of survival. These means are provided for by an outside or international entity. In the case of Utah, Mexican cartels have played a key role in the trafficking and distribution of illegal narcotics in the state of Utah. Not only have these outside actors utilized those poor in the state of Utah to move and sell the illegal narcotics, but the illegal location and cultivation of marijuana by members of these cartels is also an issue in areas of Utah.

These areas are particularly prone to conflict as since they are often under the protection of armed cartel members who are under the directive to protect both the product and their livelihood. Another outside source has in turn utilized this illegal organizational strategy and collaborated to increase the capital gain on illegal narcotics. Recently it has come to light that Afghan cartels have been working in conjunction with Mexi-

can cartels in the import and distribution of heroin. Afghanistan being one of the largest producers in the world of the opium poppy used to produce the illicit drug have since produced cartels that have taken advantage of the established cartel presence in the state of Utah and used it to increase their production and global distribution of heroin.¹⁵

Gang Activity and Violent Crime

Another source of conflict in Utah is the presence and increase of gang activity and violent crime within its mountain communities. This may in fact be related to the isolation of mountain communities and their tendency to develop a sense of lawlessness.¹⁶ In the case of Utah, gangs tend to adhere to a racial profile. Mexican and Polynesian Gangs are among the most prevalent in Utah.¹⁷ It is these minority groups that in an act of persecution band together to facilitate organized crime.¹⁸

This rise in gang activity has also lead to a seeming rise in violence in the state of Utah as well. Another victim of gang activity in the state is the homeless. Salt Lake City in particular has quite a high homeless population and the gangs will often threaten these people to provide cover for various drug transactions. The homeless will often congregate in public areas such as parks. It is in these areas that these gangs will conceal themselves in order to undertake illegal transactions. The community will often turn a blind eye to the plight of the homeless and the Utah gangs will take advantage of this and utilize them as human camouflage.¹⁹

Radical Movements, Militias and Terrorist Threats

Yet another key source of conflict within the state of Utah is radical movements, militias and terrorist threats. Radical movements and militias can all be disseminated from the same source. When state governments fail to address issues from non-governmental forces the breakdown of legitimate authority fails and leaves the door open for an environment of minimal security in which to incubate criminal activity.²⁰ This is widely seen throughout Utah in its self-armed and low governed militia groups. These groups often form on the basis of radical ideas and arise from a place of virtual lawlessness.²¹ Though these groups primarily contrive out of foreign groups including cartels, refugees and gangs, many militias from within Utah's indigenious do arise. These groups become danger-
¹⁵Burbank, Chief Chris. Interview. Salt Lake City Police Department. Salt Lake City, Utah. October 17, 2012.

¹⁶ Starr, 171.

¹⁷Burbank.

¹⁸ Starr, 171.

¹⁹Burbank.

²⁰ Starr, 174.

²¹Burbank.

ous when they enact on their radical ideas and inflict violence on the surrounding communities. One example relates to the Mexican drug cartels in Southern Utah engaging in combat with local authorities in protection of a marijuana crop.²²

Terrorist threats have also become a common source of conflict in the state of Utah. Salt Lake City is one of the sixty-four urban metropolitan areas that have been designated by the federal government as “high-threat, high-density” with regard to acts of terrorism.²³ Though Utah does not have a history decorated with terrorist acts, its geographical location and abundance of natural resources have placed high on the list of potential areas of terrorist activity after the 9/11 attacks.²⁴ Utah is privy to numerous reservoirs and watersheds which countless citizens from within the state and surrounding areas are dependent upon. This makes it an ideal place for a terrorist strike. Rather than a direct attack such as the 9/11 attacks, which took the lives of several thousands, an attack on Utah’s water supply could potentially be detrimental to countless more.²⁵ Another target for terrorists and extremist groups is the central location of the Church of Jesus Christ of Latter-day Saints in Salt Lake City. This is the headquarters of one of the largest religious organizations in the world, which makes it a keen target for zealots and extremists.

Extreme Racial and Cultural Diversity

The last major contributor to conflict in the state of Utah is a boom in racial and cultural diversity. Utah has the seventh-largest and fastest-growing immigrant population in the nation, a measure that the Department of Homeland Security and the FBI associate with potential threats.²⁶ Where this would seem to be a positive attribute for many communities, in Utah it often acts as a catalyst to conflict on a broad scale. In the last couple decades Utah as well as Idaho and Montana have seen a major influx of refugees from Somalia and Bosnia as well as many seeking political refuge from Middle Eastern countries. This in and of itself is not a source of conflict, but the tensions that have arisen after 9/11 attacks have to some degree heightened.

Additionally, a lack of religious and cultural tolerance within the state has led to an alienation of these minority groups. Several backlashes from this alienation are as follows: First there has been a rise in unemploy-

²²Sanders.

²³Price, Martin F. *Key Issues For Mountain Areas*. NY, New York: United Nations University Press, 2004.

²⁴ Sanders.

²⁵ Ibid.

²⁶ Price.

ment among these groups. With less tolerance for these refugees a scarcity of jobs being provided for them rises and only exacerbates the potential for these groups to react out of oppression. Second, Utah law enforcement has lost out on a great resource of intelligence gathering. By alienation Arabs, Muslims and Middle Eastern Americans the state of Utah has lost out on many potential sources of quality intelligence in which to implement its counterterrorist measures. Third, the alienation has led to a loss of behavior profiling and led to racial profiling. This has made it so the minority groups are afraid to approach the law enforcement groups to report criminal acts for fear of being profiled and victimized themselves.²⁷

Best Practices

Causes of conflict in the state of Utah are similar to that of other mountainous regions around the world. Yet in a developed state with a modernized society of mountain people, conflict also modernizes as well. This type of modernized conflict requires an equally modernized course of action and application of best practices to counter the conflict and maintain order in a state cohabited with such cultural diversity.

The first step is adequate representation in the Utah house. As discussed before it is imperative that the Native Americans seek out a more active role in the Utah political process as well as representation in the Utah state government. This will insure that the best interests of this indigenous people will remain a central focus of the state as it progresses and continues to modernize and will insure that those underrepresented do not get sidelined as the world around them continues to advance. This includes the establishing of a system to monitor both social and economic conditions in the state of Utah, so proper data can be recorded to address actual conditions.²⁸ This coupled with the active engagement of the mountain people themselves will help them maintain a more viable institution of social welfare and public health.

The next course of action for Utah in dealing with conflict addresses drug trafficking, cartel activity, violent crime and terrorist activity. Utah's law enforcement has utilized three key strategies that are central to sustainable mountain development conflict prevention. These strategies include making mountain issues an international action, learning from tradition and actively engaging the mountain people themselves.²⁹ The Salt Lake City Police Department has utilized these key elements in combating these particular areas of conflict. First, the Chief of Police has collaborated with governmental agencies such as the FBI and the CIA as well as begin-

²⁷Burbank.

²⁸Starr, 176.

²⁹Starr, 176-178.

ning a fully operational Intelligence Center within its own department.³⁰ This collaboration works in intelligence gathering and the prevention of violent crime and implementation of counterterrorism through a series of joint task forces. “US intelligence and homeland security agencies and the Department of Justice measure the potential terrorist threat to Utah by analyzing data, including the following: Utah is one of 15 states where US attorneys secured no terrorism convictions from September 11, 2001, through March 2010, according to the Justice Department.”³¹ After 9/11 Utah law enforcement has changed its focus on preventative measures and intelligence gathering rather than a response system to violent and terrorist acts.

In response to the growing diversity in the culture and ethnic establishment in the state of Utah and its direct effect on organized and violent crime, Utah has taken traditional practices and involved the International aid of Israel in its implementation of tactics in dealing with this issue of conflict. Utah has followed Israel’s model of creating neighborhood upon neighborhood of empowered citizens regardless of religious or ethnic background and made them accountable for their own environment. Over the last six years, the Salt Lake City Police Department has taken measures to become more approachable to its citizens and more interactive within the community. The chief of the Salt Lake City Police came to the realization that Israel has armed an entire nation of its citizens with the tools necessary to defend themselves through mandatory military service. While Utah does not participate in this practice it does implore its citizens to act in a cohesive manner and take charge of their neighborhoods. This holistic approach builds credibility in the community, with a watchful eye that exists all the time, not just when there is a problem. There is never enough police to prevent all the issues of conflict, but there are always enough community members.³²

Conclusion

It is apparent now more than ever that there are common catalysts among all mountain communities that create similar sources of conflict. It is also apparent that this conflict is evolving with developed communities rather than developing communities. Through the study and identification of these conflicts and the archiving of current data on conflict in mountain regions around the world, it becomes a more simple process to approach these causes of conflict and address them in a more pragmatic fashion. Through the collection of data and the implementation of best practices

³⁰Burbank.

³¹Price.

³²Burbank.

the issues of conflict become a more manageable problem to approach; and with realization that all mountain communities suffer from the same conflict related issues, more visibility is brought to the importance of addressing the mountain zones of the world which house over 24 percent of its population.

Mormon's Political Challenges Settling in Utah

By Melanie Woodbury

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Introduction

Throughout the existence of communities in mountain regions, the state legislators governing those mountain communities have been taking measures to collect the resources the presiding bureaucrats deemed necessary. These mountain communities face difficulties that challenge their way of life, which include harsh climate and socio-economic conditions. To address these challenges, bureaucrats implement policies and institutions to help pre-existing mountain communities sustain their culture and the mountain environment.

The situation regarding sustainable mountain development in Utah is unique compared to most mountain communities. While Utah has its fair share of rural mountain communities, their mountain people differ from those of other mountain environments. In most mountainous areas, the majority of the people living in those regions are indigenous to the area. Most of the people currently living in rural mountain communities in Utah are either not of Native American descent and have migrated from areas outside of Utah, or they share lineage with pioneers who have settled in the Utah Valley. Utah legislatures did not take measures to preserve the culture and lifestyle of the natives after the Mormon pioneers had settled in the Salt Lake Valley. Whatever natives have lived in Utah have either been re-located to other areas, or exterminated. The same can also be said of people who have settled in states outside of Utah and the Rocky Mountain region. The establishment of Utah's mountainous communities is a unique situation, because the Salt Lake Valley was established by a religious group trying to build a community while overcoming challenges with agriculture, irrigation, handling pressures coming from Native Americans, as well as persecution and political pressures from the US government. The measures that the Mormon settlers have taken in building a city in the Salt Lake Valley have set the ground work for present populations in Utah and in other surrounding Rocky Mountain states. The end result of Brigham Young and the Mormon settler's efforts in dealing with the agri-

culture, facing challenges with the Natives, and resolving issues dealing with creating policies and institutions to establish Utah communities is that Utah has developed as a state, as well as the present Rocky Mountain region.

Early History: Moving to the Valley

When Brigham Young and the Mormon pioneers traveled to create a settlement in Utah, they didn't have the advantages that pre-existing mountain tribes had. Mountain communities in countries such as Cuba, Morocco, and Nepal pre-date the establishment of the Mormon settlement. Current mountain tribes have known the challenges of living in their respective areas for thousands of years. Before Brigham Young and the Mormon settlers made their way to the Salt Lake Valley, their knowledge of the terrain was very limited. Brigham Young had a vision to create a settlement that would be optimal for agricultural development for a healthy economy.

Before they made their way, Brigham Young had planned on creating a settlement in Salt Lake two years ahead of time. According to Richard Jackson's article, "Mormon Perception and Settlement," Brigham Young had researched information about the Salt Lake area from material that had been published, as well as from interviews with trappers and explorers who had been to the location he was planning on taking the pioneers to. Discussions with these fur trappers from the American Fur Trapping Company included information about the roads that they would be traveling, any possible encounters with Natives, and the climate of the Bear River Valley.¹

The church leaders had plans to relocate the settlers south of the location they were residing in. Some of the main issues that church leaders were concerned with when planning on settling in the Salt Lake Valley included, "foreknowledge of the environment of the valley, the difficulties of crossing the Great Plains, the initial reaction to the environment of the valley, and the origin of irrigation techniques."² When the Mormon settlers were migrating out of Illinois to flee from persecution, the church leaders ideally planned to settle in either Oregon or California.

The Oregon region was deemed an appropriate area for the Mormon pioneers to claim as their settlement after reading glowing reports about the vast amount of promising cultivatable land, as well as having the capacity to create a lot of opportunity for jobs for a healthy economy.

¹ Jackson, Richard H. "Mormon Perception and Settlement." *Annals Of The Association Of American Geographers*, 68, no. 3 (1978): 317-334. Academic Search Premier, 330.

²Ibid.

Regarding this, one report of Oregon stated, "It abounds in the raw material of commerce, and it is adapted to almost every variety of productive labor."³

Reports about the California territory was twice as enticing to church leaders and Mormon settlers. There were many glowing accounts of the optimum climate and the fertility of the soil. Joseph Smith, the prophet before Brigham Young was appointed as the next church leader, had other plans regarding where the settlers would move to. Instead of looking to move to California, Smith proposed to move the settlers to the Rocky Mountains. After Smith had made an announcement stating that the Mormon settlers should move from Illinois to the Rocky Mountain area, several Mormon newspapers started to publish information about the Rocky Mountains given from accounts from fur trappers, government explorers, and travelers who were passing through to reach the territories in Oregon and California. Descriptions of the Utah region of made its way to Mormon newspapers. Explorer, John C. Fremont's reports, as well as accounts given by other explorers who have been to the area, were often given in a lavish manner, written in a way that made the area sound more appealing than it really was. It was this kind of propaganda that led the Mormon settlers to believe in a few false pre-conceptions about the Salt Lake Valley.

One of the most important aspects of these explorer's grandiose descriptions of the Utah valleys concerned the quality of agricultural potential in the region they were planning on traveling to. One explorer named Lansford Hastings gave Brigham Young and the Mormon settlers over inflated promises of the fertility of the soil. Hastings would also give false statements concerning the area north of the 42nd parallel. He claimed that the area north of the 42nd parallel was not a seemingly good region for the settlers to travel to. As Brigham Young was leading the settlers, he would direct the traveling group more and more southward into arid regions based on Hasting's claims.

Utah Settlement: Agricultural Changes

The initial impression of the Mormons to the Salt Lake Valley was favorable. Despite the arid climate they were in, the pioneers were still capable of irrigating the land. The Saints ran into a few complications going deeper into the more arid southern regions of Utah, because Mormon leaders claimed that the areas north of the state were too cold. Despite Brigham Young's claims that the pioneers shouldn't settle north of Utah and that it would be more ideal for them to create settlements more and more south of Utah, the settlers had created communities throughout

³Jackson, 320.

different areas of Utah.

As the pioneers were creating settlements throughout Utah, they had experienced a number of roadblocks. Thomas G. Alexander's [book, *Utah, The Right Place*] explains three difficulties that the pioneers had to overcome: First, they had to establish a base settlement for growing crops and building homes for themselves and those who followed. Second, they wanted to find other sites for towns for the thousands who would follow; and third, they needed to make arrangements to guide the remaining Saints from Winter Quarters and Kanesville to Utah.

Understanding what needed to be accomplished, early pioneer parties had begun projects to irrigate land, and cultivate farmland. According to Alexander, "Orson Pratt and his party had begun plowing and planting in the easily worked sandy loam, and they dammed City Creek and began to irrigate the newly planted fields."⁴ Pratt's party learned how to irrigate the land from observing different irrigation techniques used in different areas, such as Italy, the Middle East, New Mexico, and California. Despite the success of these techniques, there were a few areas the settlers were residing in where their irrigation techniques weren't as successful. According to pioneer's accounts, one settler had stated, "this is shurely a desert. Several springs broke out above the city suplys for erogation the land is very full of some kind of mineral [alkali] this obstructs the growth of much vegetation."⁵ According to other settler's accounts, there would also be frequent flash floods that would destroy the dams and severely damage, if not completely wipe out the settler's crops.

Resolving Agricultural Challenges: Irrigation

In order to resolve issues concerning the aridity of the environment, the settlers utilized methods that originated from irrigation systems used by the Spanish. The Mormon settlers used these methods and modified them for the different environments they would try to cultivate. As they were irrigating the land, they would organize committees that would establish certain plots of land where they would build dams and cut trenches to transfer the water in order to irrigate the land. In a more detailed account of the pioneer's methods the article, "Mormons Reach the Great Salt Lake, Utah" published in *History Today* explains that they were able to utilize the melted snow from the mountains to the east and north of the lake, which was successful in developing the land. The irrigation systems that they used had influenced modern systems of irrigation used to

⁴Alexander, Thomas G. "Utah, The Right Place." Utah History to Go. Utah Government. <http://historytogo.utah.gov/index.html>.

⁵ Jackson, Richard H. "Mormon Perception And Settlement." *Annals of The Association Of American Geographers*, 1978, 328.

cultivate the agriculture in Utah, as well as the agriculture throughout the rest of the United States, particularly the Rocky Mountain region.⁶

Utah Settlement: Trouble with the Natives

Before the Mormons had embarked on their journey across the Great Plains, the first people residing in Utah consisted of many different Native American tribes that included the Navajos, Utes, Shoshones, etc. In David Rich Lewis' article, "Native Americans in Utah," before the Mormon settlers had arrived to the Salt Lake Valley explorers and trappers, which included Rivera, Dominguez, and Escalante, Provost, Robidoux, Ashley, Ogden, Smith, Carson, Bridger, and Goodyear had interacted and traded with the Native American people in Utah throughout their explorations from 1776 to 1847. According to Lewis, the explorers and trappers that had intermingled with them had "established economic relations but exerted little if any political control over the native peoples of Utah."⁷

When the Mormon migration began there were more than 20,000 Indians living in Utah proper.⁸ After the Mormons had settled in 1847, the area that they chose to settle in the Salt Lake Valley served as a "neutral or buffer zone" between the Shoshones and Utes. As the Mormons created settlements down south of the Utah Valley, the settlers and the Natives began to come across some issues because their settlements were largely located, "in a major trade crossroads and subsistence area for the Ute people."⁹ Brigham Young attempted peace keeping strategies between the settlers and the Native Americans. Young and church authorities had organized missionary efforts to convert the Natives, due to the Mormon belief that the Natives derived from the 'Lamanite' line that had descended from the lineage of Israel as taught in Mormon scripture.

Settlers Efforts to Solve Native Problem: Policy Making

Despite peace keeping efforts the Mormon settlers would run into more conflicts with Native American tribes as their settlements in the Utah Valley would spread. As conflicts erupted, the settlers and the Natives experienced problems that broke out in war, such as the Walker War from 1853 until 1854 and the Black Hawk War from 1863 until 1868. These wars had ensued due to settlers raiding the Native's supplies in order to feed themselves. As a result of these issues, the Natives had suffered from

⁶"Mormons Reach the Great Salt Lake, Utah." *History Today*, 47, no. 7: 31. Academic Search Premier.

⁷Lewis, David R. "Native Americans in Utah." Utah History to Go. Utah Government. http://historytogo.utah.gov/utah_chapters/american_indians/nativeamericansinutah.html.

⁸Ibid.

⁹Ibid.

disease and starvation. Many of the Native American groups were either wiped out or were forced to re-locate to a more secure location. The Indian Bureau and the Mormon Church had attempted to help the Natives by establishing and operating reservation farms. These attempts, however, had proved to be completely useless. The Utes were forced to migrate to the Uintah Valley Indian Reservation that was established in 1861 by President Abraham Lincoln.

In 1863, the federal government attempted to eradicate all Indian land claims in Utah through treaties with the Shoshone, Bannock, and Goshute tribes. Through these treaties, the government moved these Native tribes to Indian reservations. Many of these Native American tribes initially refused to leave their lands, until the government had provided them with a reservation.

It wasn't until 1871 that the federal government had decided to cease instigating treaties to interfere with the Native's livelihood. To cease this practice, as of 1887, Congress had passed the Dawes General Allotment Act, which had broken up the reservations into individual farms for the Natives who were members of tribes that had their land taken away by the government. The remaining land was opened to the public for sale.

Following the Dawes General Allotment Act, the government then made attempts to assimilate the Native American people into society as American citizens and yeoman farmers. While these measures had been successful in detribalizing many Native American tribes, these attempts had largely failed, due to many Native's refusal to farm. Lewis states that as an end result of the federal government's allotment of Indian lands, "tribal land holdings fell from nearly four million acres to 360,000 acres, and individual sale of Indian allotments further reduced Northern Ute lands."¹⁰ By 1930, more than 80 percent of all Native tribes had their land taken away. Reservations were faced with dire problems among the Native inhabitants, such as "poverty, unemployment, underdevelopment, and health problems." Due to these crises, the Natives living on these reservations had become dependent on the US government.

During the Great Depression, many Natives were still highly dependent on government aid. The federal government wanted to enable these Natives to become more self-reliant. In 1934, the US Congress passed the Wheeler-Howard Act as a part of the New Deal as a way for the Native American people to become less reliant on government aid. According to Lewis, most Utah Indian groups had accepted the Wheeler-Howard Act and, "elected tribal governments or business committees, passed laws, and began planning strategies for reservation economic de-

¹⁰Lewis.

velopment.”¹¹ The jobs and federal aid was a great asset for the Native American tribes throughout the Great Depression.

Federal policy toward Native American tribes in Utah was making great progress, until the 1950s when the government’s procedures toward these tribes had begun to decline. It started when Utah Senator Arthur V. Watkins, who was the chairman of the Senate Indian Affairs Subcommittee, had a law passed that eradicated the federal government’s responsibility toward Native American tribes. As part of this act, Watkins had pressed for the cessation of Native American groups in Utah. As a result, these Indian tribes, which include the Shivwits, Kanosh, Koorsharem, Indian Peaks Paiutes, the Skull Valley and Washakie Shoshone, had lost the small amount of property they possessed. After these groups lost all that they had as a result of Walker’s act, the Northern Ute tribe acknowledged the annihilation of the mixed-blood Utes in Utah, following a drawn out internal dispute in 1954.

It wasn’t until the late 1950s to 1960s when the federal government began to assist the Native American tribes become more self-determinant by providing them with financial assistance from federal and state agencies, such as the Public Health Service, the Office of Economic Employment, etc. The main cause for the government’s change of policy toward the Indians was due to claims these Native American tribes had made against the government for violating treaty agreements. The Indians were so successful in making these claims that the federal government had paid several million dollars to compensate the natives. The US government had compensated the Utes with a massive claim settlement of \$47,700,000 in 1962. The second major cause for the federal government’s aggressive approach toward helping the Native Americans become more self-determinant was due to, “the development of mineral deposits on reservation lands, utilization of water resources, development of recreation and tourism, and industrial development to provide employment for tribal members.”¹²

Resolving Current Issues: Policies And Institutions

To help resolve a few of the issues that Utah is faced with in currently dealing with sustainable mountain development, government policies and institutions have been established in order to meet the needs of Utah’s mountain communities. The institutions set up to address these needs can be divided up into institutions that have been established specifically to serve the purpose of sustainable mountain development, and

¹¹ Lewis.

¹² Ibid.

institutions that are a pre-existing part of the Utah government.

An example of one of Utah's institutions that have been established specifically for the purpose of carrying out the agenda for sustainable mountain development is the Utah Rural Development Council (URDC). The URDC was set up as a part of the US Department of Agriculture's State Rural Development Council program in 1994. The purpose of the council is to, "bring together and join with citizens, community-based organizations, representatives of the private, public and higher education sectors, Native Americans, and federal, state and local government officials from across Utah to collectively address the economic and health needs of rural Utah communities and residents."¹³ This program places special emphasis on the involvement of everyone in the Utah community, citizen and dignitary alike, in an effort to develop the rural areas of Utah to meet the needs of these rural mountain communities.

Another example of an institution established specifically for sustainable mountain development is the Southern Utah University's SUU/Paiute Indian Tribe of Utah Collaborating Council. This council was initiated to increase the involvement of the community in sustainable development of rural areas, economic development, as well as developing education in communities by recruiting students and providing opportunities for students to get involved in internships.

In order to help the development of tourism and national parks in Utah through university initiatives, the Outdoor Recreation in Parks & Tourism Program (ORPT) was initiated. The ORPT works closely with the Office of Regional Services to educate university students to become qualified workers for a career in outdoor recreation, which includes employment at local, state and national agencies, protected natural areas, outdoor leadership and service programs, commercial recreation enterprises, and wilderness adventure/therapy organizations. Implementing this program involves arranging guest lectures in ORPT classes, organizing programs for the Intergovernmental Internship Cooperative, fulfilling the agenda for the Outdoor Initiative Mountain Ranch endeavors, and participation in updating the ORPT curriculum.

To address issues with climate change in Utah and the Rocky Mountain region, the Rocky Mountain Institute (RMI) was created. Their mission is to collaborate with the private sector, civil society, and the federal government in an effort to create efficient and renewable green energy. In carrying out these actions, the eight guiding principles that they use to execute their goals involve advanced resource productivity, whole-sys-

¹³"Utah Rural Mountain Summit: Current Programs and Activities." Southern Utah University. <http://www.suu.edu/ad/regional/projects.html>.

tems design, positive action, market-oriented solutions, end-use/least-cost approach, biological insight, corporate transformation, and the pursuit of interconnection. These guiding principles integrated in action help the RMI fulfill their agenda of “natural capitalism.”¹⁴

As part of the state government, Utah has institutions organized for the purpose of preserving the natural wildlife. A few examples of agencies include the Utah Department of Agriculture, the Utah Department of Natural Resources, the Utah Department of Environmental Quality, the Utah State Soil Conservation Commission, the US Department of Agriculture Natural Resources Conservation Service, etc. All of these agencies create laws and regulations regarding environmental matters in Utah.¹⁵

To help preserve the natural wildlife in Utah, specific policies are implemented to fit this agenda. For example, Utah Code Title 23 Chapter 14 Section 18 was passed under the Division of Wildlife Resources and Wildlife Board, which discerns the establishment of seasons, locations, limits, and regulations by the Wildlife Board. This law is executed to protect the natural wildlife in Utah by setting regulations on what areas are open for fishing or hunting, creating refuges and preserves, regulate the means in which the wildlife will be protected, establish measures and regulations for the safety of the wildlife and hunters in certain areas, prescribe hunting permits, etc.¹⁶

In Utah Code—Title 03, the Uniform Agricultural Cooperative Association Act was created to “improve the economic position of agriculture, encourage the organization of producers of agricultural products into effective associations under the control of such producers, and to that end this act shall be liberally construed.”¹⁷ The implementation of this act entails the improvement of crops, soil conservation and rehabilitation, enabling member with the supplies needed to utilize for the purposes of fulfilling this act, generating and distributing electrical energy to members, establishing businesses and educational services to members, and providing aid to finance activities that would fulfill the agenda of the Uniform Agricultural Cooperative Association Act.

¹⁴“About RMI.” Rocky Mountain Institute. <http://www.rmi.org/About%20RMI>

¹⁵ “Appendix A-Agencies.” NASDA.

¹⁶ “Wildlife Resources Code of Utah.” NASDA. “Wildlife Resources Code of Utah.” NASDA. http://le.utah.gov/~code/TITLE23/htm/23_14_001800.htm.”Appendix A-Agencies.” NASDA. <http://www.nasda.org/nasda/nasda/foundation/state/ut/ut-adxa.pdf>.

¹⁷“Uniform Agricultural Cooperative Association Act: General Provisions Relating to Agricultural Cooperative Associations.” NASDA.

Conclusion

The settlement of the Mormon pioneers had greatly influenced the creation of institutions and policies for sustainable development in Utah and the Rocky Mountain region. While there are many establishments and laws that address the needs of Utah's natural ecosystem, tourism, and rural areas, there are little to no programs established specifically for the preservation of the culture of Utah's native people. Throughout Utah's history, the culture of the Native American tribes was exterminated as a result of the settler's attempts to assimilate them into American society. Therefore, it is highly recommended for Utah to create institutions and laws specifically for the revival and cultivation of the native people who are currently living in mountain communities.

Consequences of Environmental Service Agreements in Wasatch County

By Jordan Giles

Jordan Giles is a recent graduate from Utah Valley University who majored in Political Science with an emphasis in International Relations. He has been involved with the Utah International Mountain Forum and has represented them at a conference in Aspen, Colorado and will also be present at the 4th Annual meeting of the Mountain Partnership in Erzurum, Turkey. Giles is the Social Media Manager for The Cholangiocarcinoma Foundation, a large cancer foundation, and is also politically active in his community. He will be pursuing a graduate program focused on international relations.



MAP from www.utahbirds.org

Wasatch County is one of the most pristine and beautiful rural counties, not only in Utah, but also in the entire western United States. Wasatch County is located directly east of both Salt Lake and Utah Counties. Park City, which is known for hosting the Sundance Film Festival, the largest independent film festival in the United States, is located on the border and both Wasatch and Summit Counties share the city

limits.¹ Other cities of note within Wasatch County are Heber, Midway, and Wallsburg as well as a few other small cities². Wasatch County because of its natural beauty and mountain location was honored with hosting the 2002 Olympic venue, Soldier Hollow, where many Olympic events were held including the Long Jump. This brought the world to Wasatch County. Another main attraction of Wasatch County is Strawberry Reservoir, which is Utah's most recognized sport fishery.³The before mentioned Wasatch County attractions; the 2002 Olympic venue 'Soldier Hollow', and the nationally recognized sport fishery 'Strawberry Reservoir', were able to receive the national recognition in part because of prior environ-

¹Balls, Jamie. "History of Park City." Utah History to Go. Utah Government. <http://historytogo.utah.gov>.

²Wasatch County Website <http://www.co.wasatch.ut.us/>.

³Strawberry Reservoir Information www.utah.com.

mental service agreements that were put into place many years previous. This article will look into the economic consequences such environmental service agreements have had in the development of both Soldier Hollow and Strawberry Reservoir.

Before diving into the details of environmental service agreements, it is important to learn more about Wasatch County and the important features and practices it had brought to the larger Utah economy. Wasatch County ranks as Utah's thirteenth most populated county having a population of just over 23,000 people according the 2010 census.⁴ Wasatch County is one of Utah's northern rural counties and borders both Salt Lake and Utah Counties. In its early history, Wasatch County was nicknamed Utah's Switzerland because of both its unique geographic features, including Mount Timpanogos in the west, its climate, and the large number of Swiss emigrants that settled in Heber Valley.⁵ In the Beehive History 14 text, it describes the early history of Wasatch County as the following:

The first settlers came into Wasatch County from Utah Valley in the spring of 1859 and located a short distance north of present Heber City. That same year Midway and Charleston were also settled. In 1862 the territorial legislature created Wasatch County, which then included all of the Uinta Basin. Wasatch in Ute means "mountain pass" or "low pass over high range". Heber City, named for Mormon Apostle Heber C. Kimball, was selected as the county seat. The last boundary change occurred in 1914 when Duchesne County was created out of the eastern half of Wasatch County. The county produces hay, dairy products, sheep, and cattle.⁶

Throughout the years the economy of Wasatch County moved from an agriculturally based, to a mining based, to now a tourism and serviced based economy. While there are still small agricultural and mining-base operations, tourism and the service industry are the two main revenue makers for the county. Two popular Wasatch County tourist destinations that will be discussed further are first the 2002 Winter Olympic venue Soldier Hollow, and the popular sport fishery Strawberry Reservoir. However one reason these two attractions are being focused on are because of the environmental service agreements (ESA) that have helped them maintain their prominent status, not only in Wasatch County, but also

⁴Utah Census Information onlineutah.com.

⁵ Utah.gov. *Wasatch County History* <http://pioneer.utah>.

⁶ Beehive History 14: Utah Counties. 1988. Utah State Historical Society.

in Utah and throughout the other western states.

Environmental service agreements are agreements between two cities, usually an upstream and a downstream community (may also include agreements between cities and counties, cities, counties and a Federal or State Agency etc) in order to both protect the shared environment as well as provide and share the economic benefits.⁷ In *Key Issues for Mountain Areas*, Price, Jansky and Latsenia give several reasons why environmental service agreements are needed.

The first reason given for why environmental service agreements are needed is because of the downstream effects of mismanagement.⁸ All over the world evidence of mismanagement is everywhere, especially in developing countries. This evidence can be in the form of shallow aquifers and wells, siltation of hydroelectric facilities and reservoirs because of hillside erosion, less water retention in the dry season, and more violent floods in the rainy season. Another major evidence of upstream mismanagement is water purity. The next reason which is given, is the plight of mountain dwellers, meaning mountain populations immigrating to other areas. Mountain peoples are connected to their land, when their land is good, the people will stay, when the land is poor, the people leave. Mountain areas tend to be poorer, and because of that, often people do not plan ahead and try to get as much as possible done, in a little time possible. When this happens, usually the environment is the party that suffers. Also many populations have outgrown their communities. Overpopulation is a major problem in many mountain regions.⁹ The third reason given is that mountain environments are generally more fragile than other environments. Mountain regions experience a high differential in temperatures, which limits the varieties of crops that may be farmed. Mountain soil is usually thin and erodes easily. In an article entitled, "Land-Use Planning for Sustainable Highland Farming in the Western Himalayas", S.K. Garbru and Pradeep Kumar explain the following about farming in the highlands:

High land farming is a challenge not only to the farmers, but also for the policy planners as well as the research faculty. For reasons of accessibility, the highland farmers are isolated from the rest of the world in terms of meeting the needs of human as well as livestock population from the land they own, and the surrounding wastelands, forest lands, grazing lands etc.,

⁷Price, Martin. *Key Issues for Mountain Areas*. New York, NY: United Nations University, 2004, 64.

⁸ Ibid.

⁹ Ibid., 65.

commonly termed as support lands.¹⁰

The fourth and final reason suggested by Price, Jansky, and Latsenia is the need for payments for environmental services (PES). Monetary compensation, especially in the developing world is essential in order for environmental service agreements to be successful. In many parts of the developing world, many people go from crisis to crisis with little thought of future planning. With monetary or other compensation mechanisms, additional motivation is provided for cities and organizations to enter into agreements that will ultimately benefit both, as well as preserve the environment.

One case study provided by Price, Jansky, and Latsenia involved a watershed desalination project in Australia. The problem was that over time, the Murray-Darling watershed and the Macquarie River sub-watershed were displaying large amounts of salts and other minerals because of deforestation upstream. An Australian government agency called the State Forests of New South Wales (SF) decided to implement a pilot program entitled, "The Pilot Salinity Control Trade Agreement with Macquarie River Food and Fibre (MRFF)." This was a market based pilot program. Essentially, the irrigators, which were using the heavy mineral content water, agreed to pay US \$42 per hectare to SF for them to reforest upstream regions for ten years. "SF uses the revenues of this trading scheme to replant more trees on public and private lands. Private land owners receive an annuity, by the forestry rights remain with SF."¹¹ Thus far this agreement has had few problems and has been used as a template for future agreements in Australia.

Returning to our initial discussion regarding Wasatch County, two local projects, which implemented successful environmental service agreements, will now be discussed. First, the agreements and compensations mechanisms surrounding Utah's most popular sport fishery, Strawberry Reservoir, and second, the agreements and compensations mechanism for one of the Salt Lake 2002 Olympic Winter Games largest and busiest venue, Soldier Hollow.

Strawberry Reservoir is a manmade reservoir located sixty-five miles east of the Wasatch Front. The Bureau of Reclamation initially constructed the Strawberry Valley Project in 1922 with the main focus on an 8,400-acre reservoir.¹² In 1973, it was decided to enlarge the reservoir to

¹⁰Ghabru, S.K., and Pradeep Kumar. "Land-Use Planning For Sustainable Highland Farming in Western Himalayas." Archives of Agronomy & Soil Science, 48, no. 4 (2002): 385-394. Academic Search Premier.

¹¹Price, 67.

¹²Strawberry Reservoir.

17,164 acres. According to the official history found on the Wildlife.Utah.Gov site:

Strawberry Reservoir has been managed for more than sixty years for the production of rainbow and cutthroat trout. Yellowstone cutthroat were introduced into the reservoir sometime during the mid to late 1930s, and this species subsequently became hybridized with rainbow trout. This introduced cutthroat later become known as the Strawberry cutthroat trout, and has been widely used in the statewide fisheries management program.¹³

In the 1950s the populations of Utah chub, Utah sucker, carp and yellow perch had exploded and nearly destroyed the trout populations. In October 1961, the decision was made to chemically treat the reservoir, with a chemical called rotenone, and essentially kill all fish in order to start over and carefully control the species of fish in the lake.¹⁴ This effort proved successful. This idea of careful control lead to one of the first environmental service agreements in the Wasatch County area and would lead the way for many others.

In 1973 it was discovered that the Utah chub and sucker had subsequently reappeared and populations rapidly expanded throughout the 80s. In 1986, gill netting confirmed that over 90 percent of the biomass in the reservoir was non-game fish. In the 1990s it was decided again to chemically treat the reservoir. It was the largest chemical treatment ever attempted and was 99 percent effective. After the treatment Strawberry was stocked with Bear Lake cutthroat trout, sterilized rainbow trout, and kokanee salmon. Ever since this most recent chemical treatment Strawberry Reservoir has remained Utah's top sport fishery. In 2010 it is estimated that Strawberry Reservoir brought in \$20 million to the state, 14 percent of total state hours spent fishing were at Strawberry, and anglers spent approximately 1.5 million hours on its waters.¹⁵ Because of the environmental service agreements as well as the payments for services acted into by both the Bureau of Reclamation as well as partnerships between Wasatch Counties and the communities located within, Strawberry Reservoir has become and been able to maintain its status as a major tourist destination, sport fishery, and economic driver for the county.

The next major attraction and economic driver for Wasatch Coun-

¹³Background and History wildlife.utah.gov.

¹⁴ <http://harvester.lib.utah.edu/wwdl/index.php/record/view/5441>

¹⁵ Serdar, David. Uinta National Forest. *What's at Risk*. www.sportsmen4responsibleenergy.org

ty, which we will discuss, is the 2002 Salt Lake City Olympic Winter Games venue, Soldier Hollow.

In a conference call late Wednesday with Gov. Mike Leavitt's office and representatives of a rival bid from Sherwood Hills, a private resort at the edge of the Cache Valley, Edwards said he was unsure which site the state's political muscle would choose to back. It wasn't until Thursday morning that the outcome became evident. "When they flashed the slides up comparing the sites during that meeting (of the Salt Lake Organizing Committee), it was just too obvious," said Robyn Pearson, the local Chamber of Commerce representative in attendance. In the end, SLOC chose Soldier Hollow despite the better-financed bid from Sherwood Hills and a more politically popular spot above Provo.¹⁶

The City of Midway was chosen for its prime location and the right amounts of average snow and the right proximity to Salt Lake City and other main Olympic venues. Soldier Hollow is located close to Heber City, which is located fifty-three miles south of Park City. Many environmental service agreements were implemented for this project. Soldier Hollow was developed in such a way that, "... Soldier Hollow is considered to be one of the most environmentally friendly of the Salt Lake Olympics venues - largely due to the fact that the area was not in a pristine state before it was developed for use in the Olympics."¹⁷ These agreements came in the form of planting new trees and groundcover to avoid erosion because of new development, protection and management of many of the streams in the Jordan watershed area, as well as a limit to the kinds of buses, which would be allowed to transport guests to and, from the venue. Also in addition to busses, as special station for the Heber Creepers, (historic steam trains) were constructed to provide additional transportation.¹⁸ A great deal of time and funds were spent insuring that there would not be any environmental scars in the Soldier Hollow and Snow Basin areas because of the Olympics.

¹⁶Cates, Karl. "Midway Celebrates an Olympic Decision." *Deseret News*, Oct 10, 1997. www.deseretnews.com/article/588004/Midway-celebrates-an-Olympic-decision.html.

¹⁷Lazaroff, Cat. "Winter Olympics not a Green Triumph." *Ens-Newswire*. www.ens-newswire.com/ens/feb2002/2002-02-11-06.html.

¹⁸Twyman, Gib. "Full Steam Ahead for Creeper 02" *Deseret News*. April 1 2012. www.deseretnews.com/article/798520/Full-steam-ahead-for-Creeper-in-02.html

After the initial sustainable construction and environmental conservation practices were implemented, the Soldier Hollow Olympic venue was complete. Soldier Hollow was the busiest venue during the 2002 Olympic Winter Games. Twenty-three events were hosted at the venue including the biathlon, cross-country skiing, and the Nordic combined.¹⁹

Since the 2002 Olympics, Soldier Hollow remained a popular tourist destination. In the winter there is tubing and cross-country skiing, in the summer there are hiking and biking trails. Soldier Hollow has continued to develop land around the venue and it now hosts a 36-hole golf course and a variety of other attractions. The implementation of environmental service agreements at the beginning of the development of Soldier Hollow has paved the way for it to remain one of Wasatch Counties prime tourist destination bringing millions into the Utah economy.

In conclusion, it can be seen that environmental service agreements have been very beneficial both to the people and to the economy Wasatch County. They have helped drive the economy of Wasatch County by providing an environmentally friendly, yet economically stimulating attraction that many Utahans enjoy. Soldier Hollow especially, has become a benchmark for other Winter Olympic venues to be measured by because of its small environmental footprint and the post-Olympic revenue which has been brought in. The successful treatment and retreatment of Strawberry Reservoir has shown that when agencies on a local and state level work together, through environmental service agreements and payments for environmental services, substantial progress can be made. It will be important to remember these successes as new projects come into development so as to both protect our environment as well as provide an economic stimulus to communities all throughout mountain regions.

Additional Resources:

Johnson, Jim. *Environmental Assessment of Plans to Restore the Strawberry Valley Rishery*. 1st. 87-14. Salt Lake City: Utah Division of Wildlife Resources, 1969. 27-89.

Scheberle, Denise. *Federalism and Environmental Policy: Trust and the Politics of Implementation*. 1st. Washington DC: Georgetown University Press, 1997. 159-78.

Smith , Zachary. *The Environmental Policy Paradox*. 3rd ed. Upper Saddle River: Prentice Hall, 2000. 284.

¹⁹Soldier Hollow Information Utah.com/olympics/.

Sustainable Mountain Development: State Rights vs. Federal Rights

By Thomas Hone

Currently, Thomas Hone is working on a master's degree in International Affairs and Global Enterprise at the University of Utah while trying to master Arabic. He graduated from Utah Valley University in 2012 with a degree in Political Science with an emphasis in International Affairs and minors in History and American Indian Studies. Hone has always had an interest in understanding why nations and people make the choices they do and how that might affect their relationship with others, especially when it comes to the Middle East. After finishing his degree he hopes to live internationally, working with others, to shape policy that will not only further strengthen US security interests but strengthen ties between the people of the Middle East and the United States.

Over thirty million acres in the state of Utah are controlled by the Bureau of Land Management (BLM).¹ This comes to approximately seventy percent of the land in Utah. In much of this land, there have been discoveries of valuable resources such as natural gas and oil, both of which are growing in value and importance as the nation as a whole faces potential energy crises. In both the past and present, it has been left up to the BLM and not the state to decide which areas can be accessed for the purpose of mining/drilling and who is able to do it. The question that is raised is this the best policy? Should a federal organization decide what is best for a state, especially in a state where the majority of its land and energy potential are controlled not by them? The answer to this is simple, no. The decision in how land should be used and protected should be done at both a local level and a federal level. This will be shown by examining the history of the BLM; the role that it plays in land and energy policy; how this policy has affected Utah; the issues surrounding energy policy in Utah; what control of its land could mean for the state both policy and revenue wise; and how this could be accomplished.

History of the Bureau of Land Management

The origins of the Bureau of Land Management can be traced to the beginnings of the United States and the passage of the Northwest Ordinance and the Land Ordinance of 1785. The purpose of these ordinances were to ensure that the Federal Government would be the one directing and controlling how the west was to be settled. This began the precedence of the Federal Government being able to control how land was to be used and what it was to be used for. After these early ordinances were passed, and the American people began to move further west, a number of other

¹ "Energy, Environment and Federal Lands," Welcome to Congressman Jason Chaffetz. <http://chaffetz.house.gov/issue/energy-environment-federal-lands>.

ordinances followed in order to deal with any new problems that began to arise from the movement. This pattern would continue until the late 1800s when the policy began to shift. It soon became realized that the land that held valuable resources and is of such wonder and beauty that they would need to be protected. Thus, instead of using land to promote settlement and private ownership the Federal Government shifted its policy to encourage public ownership. An example of this shift in policy was the creation of Yellowstone National Forest which was then followed by the creation of Yellowstone National Park.²

The area that would become known as Yellowstone National Park was largely unexplored. It had been bypassed by Lewis and Clark and it was not until further exploration of the West by the military and mountain men that its wonders and beauty began to be known. Then an expedition led by FV Hayden compiled large amounts of data, paintings, and photographs. These were then taken back to Washington D.C. and used to convince the US Congress and President Grant that if something was not done the area would face the same fate as that of Niagara Falls. Niagara Falls, another ecological wonder, had been turned into private economic side-show in which only the upper class was able to enjoy. In addition to this private ownership of the area much of the natural beauty was beginning to be lost due to economic advancement.³ FV Hayden did not want the area now known as Yellowstone to follow a similar fate. He envisioned an area that would be free of industrialization and free for all to enjoy and in March of 1872, the US congress and the President Grant signed it into law. Thus began the policy of setting aside land for the use of the public and the preservation of natural beauty. After this change in policy war time issues caused a shift back to original issues and a less of focus on preservation.⁴ However, in 1972, the idea of preservation and environmentalism arose once more to send the focus back to the creation of protected areas. This

²United States, Bureau of Land Management, National Science & Technology Center, *The Federal Land Policy and Management Act of 1976*, by Terry D'Erchia, Peter Doran, and Lee Barkow (Colorado: BLM), pg. #.<http://rs6.loc.gov/cgi-bin/ampage?collId=lsl>.

³"Falling for Niagara." *The New York State Preservationist* 6, no. 1 (Fall 2002): 14-15.

An Act For the control and regulation of the waters of Niagara River, for the preservation of Niagara Falls, and for other purposes, 34 626 §§ 3621-628 (1906).

⁴Hays, Samuel P. *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920*. Pittsburgh: University of Pittsburgh Press, 1999.

attitude has, since that period played a major role in US politics.⁵

This change in policy began to cause more issues to arise. Such as what part of the Federal Government would monitor such land and how was it to be founded. In addition to this on many of these lands there was discovered valuable resources such as coal, oil, and other precious metals that would benefit both the local and national economy and the questions arose on whether or not these resources could be acquired and if so by who? In the West especially, oil was being discovered and the land was being claimed so quickly by others that it was feared that in a matter of months there would be no open land. Thus, this act was passed and the power to determine who would have access to the minerals on land was given to the Federal Government. In addition to this, as settlement[s] of the West began to increase it was seen that land would be needed for grazing and just as with the oil, it was seen that someone would need to ensure that not all the land was lost to the ranchers.⁶ The issue with these acts is that it gave various departments within the Federal Government overlapping control and it was seen that a central department would be needed to manage the everyday task.

In 1946 these various powers and responsibilities were combined into one single entity, known as the Bureau of Land Management (BLM). The early years of this organization were chaotic. The department itself found that there many laws on the book that contradicted one each other and that the department itself had no power to change or enact any new policy of its own. This would still have to come from other departments. This meant that the Bureau of Land Management was unable to fully enforce any policy or make any much needed changes. It would not be until 1976 when Congress passed the Federal Land Policy and Management Act of 1976. In this act Congress noted the value of certain public lands and that more would need to be done to manage them correctly. Thus, power was given to the Bureau of Land Management to address topics such as land planning, acquisition, administration of federal land and range management. Thus, nearly two hundred years after the idea of managing and preserving land was thought up, a department with the ability and power to do so now existed.⁷

⁵Merrill, Marlene D. *Yellowstone and the Great West: Journals, Letters, and Images from the 1871...* Lincoln: Univ Of Nebraska Press, 2003.

⁶Mineral Leasing Act of 1920 30 U.S.C. § 181 et seq.

⁷United States, Bureau of Land Mangement, National Science & Technology Center, *The Federal Land Policy and Management Act of 1976*, by Terry D'Erchia, Peter Doran, and Lee Barkow (Colorado: BLM), pg. #. <http://rs6.loc.gov/cgi-bin/ampage?collId=llsl>.

Role of the Bureau of Land Management

Simply put the role of the Bureau of Land Management is to sustain the health, diversity, and productivity of the public lands for enjoyment of present and future generations and ensure that the United States has access to natural resources in order to sustain itself. These two goals seem to be at odds with each other. On the one hand it is up to the Bureau of Land Management to restrict access to certain areas due to environmental sensitivity, promote new areas to come under federal protection and to manage said areas while at the same time allowing areas to be mined and drilled for natural resources.

The Bureau of Land Management has under its jurisdiction two hundred and sixty-one million acres of land. This includes nearly sixty national parks and other types of protective land. Most of this land is to be protected from industrialization, mining, and drilling due to the wildlife and historic sites it may contain and for preserving open space. As stated, it is the Bureau of Land Management's goal to preserve public lands for the enjoyment of all. This includes taking provisions to protect the various plant and animal species that exist on the land. To achieve this goal the Bureau of Land Management has set aside land not to be used for development, of which includes roughly ninety million acres for big game species, host two hundred and twenty-eight environmentally sensitive plant and animal species and seeks to irradiate nonnative species. Examples of this are found by the re-introduction of wolves to areas such as Yellowstone and the desire to create a preserve in the Midwest for creatures such as the buffalo. The purpose of this is to ensure that these native species will be able to not only survive but also continue to grow so that they can be enjoyed by all for years to come. In addition to the preserving of land and creature, it is also the Bureau of Land Management's responsibility to preserve water sources. This is especially important out West where water can be scarce. Thus, they need to ensure that there is water that can be used for agriculture, ranching, and drinking. In order to do this they have in their control one hundred and forty-four thousand miles of riparian-lined streams and thirteen million acres of wetlands. In addition, they have overseen the creation of a number of dams in order to ensure that water can be stored for in times of drought. Lastly, various historical sites also fall under their control. As settlement of the West continued, it was realized that steps would need to be taken to preserve the history of the United States in order to allow future generations to enjoy them. These include sites such as ancient Native American ruins, early settlements, and other sites that are deemed to have historical and culture value.⁸

⁸ United States, Bureau of Land Management.

On the other side is the Bureau of Land Management's goal to ensure that the United States will have access to certain strategic natural resources. This goal is smaller in wording but just as large and great responsibility as the culture and environmental side. This would include oil, coal, and natural gas, and the lands in the western half if the United States held many of these resources. In addition, they were being taken for the use in the private sector and it became a worry within the federal government that in time of hardship or war they may need to be able to exert more control of the use of these resources. Thus, under the idea of national security the federal government directed that a certain number of lands be held and protected for just such times.⁹

These missions appear to be at odds with each other. On the one hand, it is the Bureau of Land Management's responsibility to ensure that environmental and historical sensitive sites are protected from development and are able to be enjoyed by all, while at the same time allowing economic development to better the United States economy. Such a complex goals become even more complicated when it must not only take into account the effect that such policies may have at the federal level but the state level as well.

The Issues

The main issue lies in the idea of who actually has the power. To understand the issues fully it first needs to be understood where it began. At the United States formation there was one thing on every one's mind, where should the power lie? It was seen after the revolutionary war that a strong central government would be needed if peace between the colonies was to last. Thus, leaders of the colonies met to determine just how this government would work. There were two sides to this issue. On the one side colonies such as New York, Virginia, and Pennsylvania sought an agreement where the majority of the power would lie within the larger colonies while others such as Delaware, Rhode Island and other small colonies wanted to make sure that they had a voice in the government and would not be overshadowed. After days of deliberation, they would come up with a compromise that would not only satisfy both the large and small colonies but create a government that would allow for power to exist at a state and federal level. The problem that has arisen with this compromise is that there have been times in which these two powers have been at odds with one each other. This is especially seen in the battle over land control in Utah.

As noted before in the history and roles of Bureau of Land Management they have been commissioned by the Federal Government to con-

⁹ United States, Bureau of Land Management.

control some land for various purposes. In the State of Utah, approximately 67 percent of the land is held by the Federal Government. This includes five national parks, seven national monuments, two national recreational areas, one national historic site six national forest, and other land deemed either environmentally sensitive or strategic for its' resources. The reason behind why so much land is in the control of the Federal Government can be found within the theories of the *Key Issues for Mountain Areas*. Within the book it speaks of a number of issues that face mountainous areas, namely the best approach to maintain sustainability in mountainous areas and at what level of government should have the control. In Chapter 7, it creates categories that mountainous areas can fall. The one pertaining to the issues in Utah is high environmental /low linkage area. This means that a majority of land in Utah is deemed to be environmentally sensitive and since for the most part these areas are not populated ideas where needed to preserve them. The one that is a proven technique to handle this is the creation of national/state parks or other types of protected land. This technique allows environmentally sensitive land to be protected and to control growth of certain areas to be able to sustain the area.¹⁰ This is not the issue. The majority of those within the state of Utah believe that land should be protected; the issue then lies in who decides what gets the label of a national park/monument and what can be developed.

Federal Government Perspective

The main goal of the Federal Government is in any capacity is to create a streamlined and universal process that affects everyone equally. Thus, its goal is to ensure environmentally sensitive land and resources are held to the same level of protection from state to state. There are a number of reasons behind this. The first being that politics vary from state to state, this means that each state will place various level of importance on land within their state. Such as where one state may seek to preserve an area of land due to its historic/environmental value while another may look at the same piece of land and believe that it is in its best interest to obtain the resources that or held there. This could lead to a loss of environmentally sensitive land or the loss of value resources.¹¹ The second involves business. Just as business, technology, and resources vary from country to country it also varies from state to state within the United States. States that are rich in resources such as oil, coal or natural gas seek to improve revenue by being able to access and sell the land. In addition as seen just

¹⁰Price, Martin F., Libor Jansky, and Andrei A. Iastenia. "7." *Key Issues for Mountain Areas*. Tokyo: United Nations University Press, 2004.

¹¹VanAsselt, Wendy, and Layke Christian. "Protecting the Best of the West." *Issues in Science & Technology*, 3:43-52.

a few years ago during the real estate bubble, developing land, whether it be for residential or business, has the ability not only to bring in profit for various business but states as well. An example of this can be found within the state of Utah in which property taxes are the primary source for funding for education. Meaning the more land that is held by residents or business the more revenue the state is able to bring in. Thus, each state seeks to use the land in several of ways depending upon the needs of the business and technology in the state. Thirdly, the land that holds valuable resources may need to be held for times of economic stress or warfare. As noted above there where those that became worried that the land in reach valuable resources were held would become inaccessible to the Federal Government or depleted, and thus drastically hurt the United States when such resources would be needed. In order to prevent this they took control of these lands. Lastly, the holding of this land by the Federal Government ensure them a revenue stream that can be tapped at any time. The land in which valuable resources are found can be sold or auctioned off to private companies and the revenue from such a sale would go directly to the Federal Government. This can come in handy in times of economic strife when tax revenue may be low or in the time of war when revenue is needed to be able to fund the war effort. In order to accomplish all of this, as noted before, they needed an organization to handle all of these issues.¹²

The BLM exists to act as an impartial entity that is able to weigh the benefits of developing or preserving an area of land. They take the states perspective, a federal perspective, an environmental perspective and many others and weigh them to see which option may be the best option. This is done to ensure that the land is used in a proper manner and not exploited. When it comes to land and its uses the majority of states and business look at the profit margin, rather than the impact that developing may have on society as a whole. Thus, from all of this it can be seen that the Federal Government's goal is to ensure the protection and wellbeing of society as a whole. In addition to the BLM, there is one very important reason that the Federal Government feels that it has the right to keep and maintain the land. This thought process can be found in most legislation that admitted states to the Union. In the Enabling Act of 1894, the act that brought Utah into the Union, it stated that the Federal Government would have control over any land that was not then claimed by settlements of the Native Americans, and that such land could not be taxed by the state, but would be maintained by the Federal Government.¹³

¹²Mineral Leasing Act of 1920 30 U.S.C. § 181 et seq

¹³United States, Bureau of Land Management.

Utah Perspective

The states perspective is not that much different from the Federal Government's perspective. It is just on a smaller scale, and to explore this it shall be shown from that state of Utah's point of view. The reason behind this is that while the Federal Government holds land in all fifty states, Utah has the highest percentage out of any state whose land is held by the Federal Government. Thus, it is easier to see how federally held land affects Utah. As noted already, the majority of Utah's land is held by the Federal Government and as noted a primary source of its education budget is derived from property taxes. Thus, to begin with, the inability to develop land within the state causes it to miss possible revenue to fund education. In turn, that money has to be taken from other departments and programs and thus they suffer as well. In order to prevent this loss of revenue the state has sought from time to time to be able to regain the use of federally held land. This being the case it devotes large amounts of time and money lobbying to get land returned to its control. There are more examples to be seen how it may be done and the effectiveness thereof. In addition to this, two sides have emerged in how to fix this issue. There is one side that believes that the state can work together with the BLM and other entities of the Federal Government to come up with solutions that will benefit all, and others who believe the only solution is to allow the State to have complete control. An example of latter can be found in a statement from the Governor of Utah.

On March 23, 2012, Governor Herbert issued a statement on public lands in Utah. He said that it is time for a "Utah Solution." The issues, he states, is that two issues have come head to head now within the state of Utah, these being the continued ability to fund education and the lack of control that Utah has over its lands. As noted already, the primary source for funding for education in Utah comes from property tax, and Utah is about to the point in which there is not enough available property to tax. Governor Herbert sees this as a big issue; for he believes that in order for Utah to grow economically, it must continue to improve the quality of education that it provides. While Utah leads the nation in the percentage it spends on education it is near the end in per pupil spending and would need an extra 2.2 million each year in order to just keep up with the national average. With the current system, there is not only no way for this aim to be accomplished, but there is no way to prevent the state from falling further behind. Thus, the state must come up with other options in order to fund. The problem with these other options is that they cannot fully fix the problem. As Governor Herbert states, income taxes would have to be raised 100 percent just to reach that average, and that is just not a do-able

option. Other options include raising property taxes, but this again will not raise the revenue, or cut money from other programs. This however, still does not bring in enough revenue and hurts other areas. This being the case, the state of Utah sees only one solution. It must be able to have control over all of its land in order to bring the revenue that it needs.¹⁴

Governor Herbert is not the only one that sees the dilemma facing the state of Utah. Congressman Chaffetz understands that Utah is in a difficult position with the majority of its land in Federal control. However, he believes that a solution can be found by working with state and federal entities. The land that is under the control of the BLM and other federal agencies is just not sitting there and not producing. These lands, as the Congressman points out, have contributed to millions of dollars both to the State, and to the Federal Government. In fact the only time in which these lands are not profitable is when polices are put in place that restrict and limit the ability to use the land, of which the Congressman believes is the result of Washington DC not listening to State. Polices regarding land must be made by both those in Washington and those at the State level, such a decision making process, the Congressman states, will lead to decisions that are guided by logic and commonsense.¹⁵ The key though is open communication.

These two points, while differing in solutions, show similarities, they both understand how precious and beautiful the land is in the state of Utah and understand that there must be guidelines in place to protect it. However, they also understand that in some of these areas there are resources that can be used to grow the economy of the state and fund important programs, such as education. They both show that the issue lies in how the Federal Government treats the state in regards to its demand, and the biggest issue is the lack of communication. As stated by the Congressman open communication needs to exist to find a solution and the issue the Governor has is that such communication does not and has not existed. A prime example of this can be found with the creation of the Grand Staircase-Escalante National Monument. This monument was created without the help of state and local leaders and the creation came across to the State as if the Federal Government was say “we can do what we please and there is nothing you can do about it.” Such a perception has only created mistrust between the State and Federal entities and has produced little to no solutions.

¹⁴State of Utah. Office of The Governor. *Utah's Public Lands*. By Gary R. Herbert and Greg Bell. Salt Lake City, 2012.

¹⁵“Energy, Environment and Federal Lands.”

The Solution

At a quick glance, the divide that lies between the state of Utah and the Federal government appears too great. On the one hand, you have an entity that is seeking to see and understand the issues from the perspective of the nation as a whole and on the other you have an entity that is looking at their own niche. Such a divide can be crossed and practical solutions can be reached. This can be achieved through open communication and by incentives.

While on the surface, it may appear that the two have little in common, as shown through the research there is common ground. The state of Utah understands that the land within it is some of the most beautiful land in the nation, and that it needs to be protected for all to enjoy. It understands also that such land brings millions into the state each year in tourism and that without it the state would suffer. Thus, the state has embraced all its national parks and monuments and has sought to find ways, with the help of the Federal Government, to bring people to them and in turn to the state. In addition, the Federal Government understands that on much of this land there is found precious resources and thus has directed the BLM to open up more of this land to be developed. This has created a minor oil boom within the eastern part of the state and with it has come jobs and money. These two examples not only show that the divide can be crossed but that the two sides can work together. The key is, just as Congressman Chaffetz stated, is open communication. When these two entities are able to come together and each side is given the chance to give its own unique perspective, a reasonable and practical solution is reached.

This is further proven by returning to the book *Key Issues for Mountain Areas*. While the majority of this book and Chapter 7 deal with international governments dealing with each other, the same concepts can be applied to the dealings between state and federal governments. In this instance when one gets right down to it there is very little difference in the United States dealing with Brazil and issues dealing with the rain forest and the United States dealing with land in Utah. Each has its own goals, both environmentally and economically, and no solution will work unless both sides come together. Thus, the authors of this book state that all parties must be involved through open dialogue and take it one step further. They state that open communication is necessary but also add that one entity is going to have to give up something. In the case the state of Utah is giving up the right to use land that could be developed and taxed of which is a necessary part of its budget. Thus to offset this the authors state that in this instance incentives should be given in order to further promote the idea of protection and allow the one entity that it is not losing

out completely. This could be accomplished in the state of Utah through an increase in funds to education or even a share of the revenue that the BLM would bring in through the selling of land for development. In both of these cases the state would be able to recoup lost revenue due to the inability to develop land.¹⁶

Granted this is a basic, simple solution and does have its issues. This would include issues such as; how should the Federal Government use incentives, should they be allowed to dictate funding that way, just how would they come up with this money, and is it worth it. All of these concerns are valid arguments, but ones that can be solved. The Federal Government already gives funds to states in which it dictates how these funds can be used and if they are not used in that way then the state loses the funding. In addition, the money to fund these incentives can come from the selling and developing of land controlled by the BLM. As to the question is it worth it. Each year the state of Utah spends a large portion of its legislative session passing “message laws” against such Federal control. These laws usually end up in court of which both the State and the Federal Government end up using tax payer money to defend their side. If incentives can end that, it would in the end save everyone money. There are still concerns with this approach, as it can be seen that the Federal Government is buying what it wants. This is once more where the idea of open communication comes in to play, for no matter how much “incentives” the Federal government is willing to give out, if the State feels that it is not being listened to or respected the chances of them going along with it are not very high.

Conclusion

It has been shown that there are organizations set up within the Federal level to deal with the various environmental issue that the nation as a whole faces. The aims of these organizations appear to vary from a federal level to a state level, but when one goes beneath the surface it is found that they are all striving for the same thing. They each want to protect the beauty that is around them while at the same time grow their own economy. Thus, it is seen that through open communication and through the possible use of incentives that both federal and state goals can be achieved for the benefit of all.

Additional Sources:

Chittenden, Martin H. *The Yellowstone National Park-Historical and Descriptive*. Cincinnati: Stewart and Kidd, 1920.

¹⁶ Price.

American Attitudes towards the Global Warming Consensus

By Gregory Haddock

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“Cooling?” was the verbiage used by Brian Winter in the headline of his March 11, 2010, *USA Today* article describing American sentiment toward the global warming movement. The article illustrates a reversal in US environmental proclivity, alleging that “a fundamental shift in efforts to stop global warming [has forced] environmentalists to scale down long-held ambitions and try to win back an increasingly skeptical American public.”¹ Recent polls reflect the accuracy of Brian Winter’s assessment of Americans’ rising cynicism toward global warming. The World Bank’s World Development Report 2010 on “Climate Change and Development” states that 43 percent of US respondents, in its public-opinion poll, indicated they believe “views are pretty evenly divided” among scientists in relation to the urgency of the climate change problem and the sufficiency of scientific knowledge needed to take action. An additional 17 percent responded that they believe scientists do not view global warming as urgent and do not know enough to take action.² This and other polls, like those conducted by Rasmussen Reports, exhibit many US citizens’ beliefs in a considerable discord among scientists on the issue of global warming.³

This essay critiques American climate change attitudes and their social construction. It will define “scientific theory” and “consensus” and use the historical progression of gravity theory as an analogy to the current theory of global warming. Citing academic surveys, it will demonstrate that, in spite of the misconceptions resulting from US media coverage, anthropogenic climate change is, in fact, a scientific consensus. Finally, in light of the scientific consensus on global warming, this essay will draw normative conclusions in the realm of US environmental and economic policy.

¹Winter, Brian. “Is the global warming movement cooling?” *USA Today*, March 11, 2010.

²The World Bank, “Public attitudes toward climate change: findings from a multi-country poll,” *World Development Report* (2010). <http://siteresources.worldbank.org/INTWDR2010/Resources/Background-report.pdf>.

³Rasmussen, Scott. “Voters Take Global Warming Less Seriously.” *Rasmussen Reports*, March 17, 2010.

Origins of the misguided beliefs of the American public on the scientific consensus of global warming may relate directly to social constructs generated by US media sources such as *USA Today*. In their essay “Balance as Bias: Global Warming and the US Prestige Press,” Maxwell T. Boykoff and Jules M. Boykoff describe the rift between academia and common American conjecture on the subject of climate change, asserting “...popular discourse has significantly diverged from the scientific discourse...this disconnection has played a significant role in the lack of concerted international action to curb practices that contribute to global warming.”⁴ Though they do not reference *USA Today* or Brian Winter specifically, Boykoff and Boykoff emphasize the contribution of “impartial” news articles, like that of Winter, to what they describe as “failed discursive translations regarding global warming.”

These press outlets have done this by adhering to the journalistic norm of balanced reporting, offering a countervailing “denial discourse”—“a voluble minority view” [that] argues...that global warming is not scientifically provable...Through overwhelmingly ‘balanced coverage’ of various decisions regarding action due to global warming, the prestige press thereby [implies] that the division between various calls for action [is] relatively even. In light of the general agreement in the international scientific community that mandatory and immediate action is needed to combat global warming, US prestige-press coverage has been seriously and systematically deficient.”⁵

The international scientific community’s general agreement concerning global warming described above is not a recent occurrence. As stated in the press release issued with the National Academy of Sciences’ 1979 *Charney Report*, “A plethora of studies from diverse sources indicates a consensus that climate changes will result from man’s combustion of fossil fuels and changes in land use.”⁶ The Intergovernmental Panel on Climate Change (IPCC) was created in 1988 as a result of the development of this unified understanding among scientists.

“Established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) to provide the world with a clear scientific view on the current state of climate change and its potential environmental and socio-economic consequences,”⁷ the

⁴Boykoff, Maxwell T., and Jules M Boykoff. “Balance as Bias: Global Warming and the US Prestige Press.” *Global Environmental Change* 14, 125-136.

⁵Boykoff, 126.

⁶Charney, Jule. “*Carbon Dioxide and Climate: A Scientific Assessment*,” Washington, DC: National Academy of Sciences, 1979.

⁷IPCC- Intergovernmental Panel on Climate Change. <http://www.ipcc.ch/organizational>

IPCC issues assessment reports that appraise the risks of anthropogenic climate change. Science historian Naomi Oreskes, in her lecture *The American Denial of Global Warming*, discusses the ensuing “steady stream of claims challenging climate science” since the establishment of the IPCC. Oreskes states, “These claims include that there’s no ‘proof,’ that the science is uncertain, that there’s no ‘consensus,’ that science is divided...and that controlling greenhouse gas emissions would cost jobs, harm, even destroy, US economy.”⁸ While the citizens of many countries in the international community have accepted the scholarship of global warming and human contribution to it, noteworthy US public opinion reflects the objections referenced to by Oreskes.

A basic, yet lamentable, contribution to American opinions on global warming is the lack of understanding of scientific terms and advancement. As has been similarly done with respect to the concept of human evolution, many Americans disregard the conclusions of global warming theory by referencing what they perceive as indeterminism inherent to scientific theories. “Global warming is *just* a theory—It’s not fact” is a common perspective one might hear in the American climate change discourse. The American Association for the Advancement of Science differentiates pedagogical and colloquial usage of the term “theory,” stating:

A scientific theory is a well-substantiated explanation of some aspect of the natural world, based on a body of facts that have been repeatedly confirmed through observation and experiment. Such fact-supported theories are not “guesses” but reliable accounts of the real world. The theory of biological evolution is more than “just a theory.” It is as factual an explanation of the universe as the atomic theory of matter or the germ theory of disease. Our understanding of gravity is still a work in progress. But the phenomenon of gravity...is an accepted fact.⁹

Like global warming, empirical understanding of gravity has been a historical “work in progress.” Philosophers as early as Aristotle, through the observation of falling objects, developed theories of gravity. Deviating

zation/organization.htm.

⁸Oreskes, Naomi. “The American Denial of Global Warming.” University of California Television, <http://www.uctv.tv/search-details.aspx?showID=13459&-subject=sci>.

⁹*American Association for the Advancement of Science*, http://www.aaas.org/news/press_room/evolution/qanda.shtml.

greatly from Aristotelian physics, which deduced that heavier objects fall at greater acceleration, Galileo accurately hypothesized air resistance as the reason lighter objects descend at a slower rate. The work of scientists like Galileo established a basis from which Newton could formulate his Law of Universal Gravitation, which can still be used to accurately approximate the effects of gravity, but has been surpassed in precision by Einstein's theory of General Relativity.¹⁰ At a future time, a more veracious model will likewise replace General Relativity. Thus is the nature of scientific theoretical advancement. Discovery of truth is predicated on the mutual acceptance and continual reevaluation of previously established knowledge.

Climate change theory has gone through, and continues to experience, a sequence of development comparable to that of gravity. Regrettably, many Americans discount global warming theory because of its essential scientific progression. Some use any change in the specifics of the predicted outcomes of climate change as grounds for rejection of the premise. Brian Winter's article examining American skepticism toward global warming science cites such an example. In the most notorious error, the IPCC (Fourth Assessment) report said global warming could cause glaciers in the Himalayas to melt by 2035. The purportedly impending disaster was cited repeatedly by environmental groups and politicians at the Copenhagen summit — including Bangladesh's environment minister, Hassan Mamud — as a reason to take urgent action. About a month after the summit concluded, the IPCC admitted the date was incorrect. It said the information was improperly taken from a report by an outside environmental group, the World Wildlife Fund, and not subjected to usual standards of vigorous scrutiny by other scientists.¹¹

While the IPCC Fourth Assessment Report may have erred in its prediction of the immediacy of climate change impact on the Himalayan glaciers, the miscalculation is in no way justification for rejection of global warming theory. If it were, similar logic would have justified complete rejection of Newton's Law of Universal Gravitation because it did not fully explain the precession of the perihelion of the orbits of Mercury. Subsequently, Einstein would not have been able to conceive General Relativity, as he did, using Newton's theoretical foundation. In regard to climate change, US citizens' general lack of understanding of the science has them all too eager to throw the proverbial "baby out with the bathwater."

Contrary to popular American perspectives, anthropogenic glob-

¹⁰Stern, David. "The Way Things Fall." *From Stargazers to Starships*, <http://www.phy6.org/stargaze/Sfall.htm>.

¹¹Winter.

al warming is no longer an indistinguishable hypothesis in a collage of scientific deliberation. The theory is now referred to by most experts as a scientific “consensus” and, arguably, has been for years. The term “consensus” brings with it an unfortunate amount of ambiguity in both the professional and public spheres. In everyday speech, “consensus” is often used similarly to its primary definition in Merriam-Webster’s Dictionary: “general agreement: unanimity.”¹² The usage of this definition in science is problematic for several reasons. The definition is contradictory—“*general agreement*” on something does not imply that it is “unanimous.” Furthermore, no belief in the history of human thought, and particularly no belief in science, has ever been unanimous. The ontological and epistemological foundations, upon which science is based, are not “unanimous.” This fact does not stop most from accepting and enjoying the knowledge and innovation that science affords. Defining scientific “consensus” as “*general agreement*” in the field of science is equally dubious because it does not clarify “general” with any level of precision, nor does it ascertain who is given license to represent scientific opinion.

US media and political leaders are influential for American opinion on whether or not anthropogenic global warming is a scientific consensus. Former Vice President Dick Cheney’s 2007 interview with ABC’s Jonathan Karl is one such example. When asked, “Is global warming a fact? And is it human activity that is causing global warming?” Cheney responded, “Those are the two key questions. I think there’s an emerging consensus that we do have global warming. You can look at the data on that, and I think clearly we’re in a period of warming. Where there does not appear to be a consensus, where it begins to break down, is the extent to which that’s part of a normal cycle versus the extent to which it’s caused by man, greenhouse gases, et cetera.”¹³ Cheney’s depiction of global warming as an *emerging* consensus discounts the findings of the *Charney Report* almost two decades prior. His denial of the scientific consensus concerning the anthropogenesis of global warming is in direct opposition to statements made by the IPCC in its Fourth Assessment Report the same year.

In agreement with previous IPCC reports dating back to 1990, the IPCC Fourth Assessment Report states, “Since the start of the industrial era (about 1750), the overall effect of human activities on climate has been a warming influence. The human impact on climate during this

¹²*Merriam-Webster Dictionary*, <http://www.merriam-webster.com/dictionary/consensus>.

¹³Cheney, Dick. Interview by Jonathan Karl. NBC News, Sydney, Australia, February 23, 2007.

era greatly exceeds that due to known changes in natural processes, such as solar changes and volcanic eruptions.”¹⁴ In her 2004 essay “Beyond the Ivory Tower: The Scientific Consensus on Climate Change,” Naomi Oreskes stresses the overwhelming agreement in the scientific community with the IPCC. She cites concurring statements made by “all major scientific bodies in the United States whose members’ expertise bears directly on the matter,” including, but not limited to, the American Meteorological Society, the American Geophysical Union, and the American Association for the Advancement of Science. To test the level of consensus, Oreskes analyzed “928 abstracts, published in refereed scientific journals between 1993 and 2003, and listed in the ISI database with the keywords ‘climate change.’”¹⁵

The 928 papers were divided into six categories: explicit endorsement of the consensus position, evaluation of impacts, mitigation proposals, methods, paleoclimate analysis, and rejection of the consensus position. Of all the papers, 75 percent fell into the first three categories, either explicitly or implicitly accepting the consensus view; 25 percent dealt with methods or paleoclimate, taking no position on current anthropogenic climate change. Remarkably, none of the papers disagreed with the consensus position.¹⁶

In response to criticism of Oreskes’ analysis, Peter Doran and Maggie Zimmerman, in 2009, published a survey of 3,147 Earth scientists from US and international institutions. Results of the survey showed that 82 percent of participants responded “yes” to the question “Do you think human activity is a significant contributing factor in changing mean global temperature?” [I]ncluding 97.4 percent of “those who listed climate science as their area of expertise.”¹⁷ In conclusion, Doran and Zimmerman wrote:

It seems that the debate on the authenticity of global warming and the role played by human activity is largely nonexistent among those who understand the nuances and scientific basis of long-term climate processes. The challenge, rather, appears to be how to ef-

¹⁴Intergovernmental Panel on Climate Change, “How do Human Activities Contribute to Climate Change and How do They Compare with Natural Influences?” *IPCC Fourth Assessment Report: Climate Change*, 2007. http://www.ipcc.ch/publications_and_data/ar4/wg1/en/faq-2-1.html.

¹⁵Oreskes, Naomi. “Beyond the Ivory Tower: The Scientific Consensus on Climate Change.” *Science*, December 3, 2004, 1686.

¹⁶Oreskes.

¹⁷Doran, Peter, and Maggie Zimmerman. “Examining the Scientific Consensus.” *EOS* 90, no.3 (2009): 22-23.

fectively communicate this fact to policy makers and to a public that continues to mistakenly perceive debate among scientists.¹⁸

As was demonstrated by the cultural shift following the desegregation of public schools during the civil rights movement, the attitudes of Americans can be greatly swayed by policy makers. Race relations in the US, however, have been a gradual, ongoing evolution; and criticism of the slothfulness of that societal progression holds equally true for the global warming movement. In his essay “The Case That the World Has Reached Limits,” Robert Goodland reflects on the imperative state of climate change issues.

The costs of rejecting the greenhouse hypothesis, if true, are vastly greater than the costs of accepting the hypothesis, if it proves to be false. By the time the evidence is irrefutable, it is sure to be too late to avert unacceptable costs, such as the influx of millions of refugees from low-lying coastal areas..., damage to ports and coastal cities, an increase in storm intensity, and worst of all, damage to agriculture.¹⁹

The urgent implications of global warming cannot wait for public sentiment to shift toward acceptance of the scientific consensus. Greater responsibility, therefore, lies with American political leaders to recognize the proven theory of anthropogenic climate change and implement environmental and economic policy accordingly.

As previously noted by Naomi Oreskes’ quote highlighting the “claims challenging climate science,” policy makers’ reluctance to concede anthropogenic global warming is often based on their perceptions of its restricting economic implications.²⁰ Indeed, in the Doran/Zimmerman survey, the area of expertise in the survey with the smallest percentage of participants answering “yes” to the question of anthropogenesis was “economic geology.”²¹ To the dismay of fiscally conservative policy makers, the level of environmental sustainability needed to combat anthropogenic climate change, may be beyond that which an unchecked market can yield. Robert Goodland’s essay remarks, “We believe that throughout growth is not the way to reach sustainability; we cannot ‘grow’ our way into sus-

¹⁸Doran, 22-23.

¹⁹Goodland, Robert. “The Case That the World Has Reached Limits.” *Population, Technology, and Lifestyle: The Transition to Sustainability*, ed. Robert Goodland, Herman Daly, Salah El Serafy. Washington, DC: Island Press, 3-22.

²⁰Oreskes. “The American Denial of Global Warming.”

²¹Doran, 22-23.

tainability.”²² However, in his own essay, World Watch Institute president Christopher Flavin shows optimism about the use of the market in policy addressing global warming.

Within the policy community there is actually a broad spectrum of views on how we ought to address the problem of climate change. Even within the environmental community, there are groups that favor carbon taxes, and others that favor regulation, or tradable permits... The majority opinion is that some sort of market mechanism is the most efficient way to reduce carbon dioxide emissions... In my opinion, reducing carbon emissions—even by the 60-80 percent that will ultimately be required to stabilize carbon dioxide concentrations—will end up being a lot easier and less expensive than most economists and industry groups currently expect.²³

It can be argued that discussion of policy specifics related to global warming is premature. American political leaders will not adopt reparative policy until they acknowledge that anthropogenic climate change is, indeed, a scientific consensus that should inform legislation. Reflecting on the impotence of its acceptance, Oreskes states, “The scientific consensus might, of course, be wrong. If the history of science teaches anything, it is humility, and no one can be faulted for failing to act on what is not known. But our grandchildren will surely blame us if they find that we understood the reality of anthropogenic climate change and failed to do anything about it.”²⁴

²²Goodland, 9.

²³ Flavin, Christopher. “Creation at Risk?” *Religion, Science, and Environmentalism*. ed. Michael Cromartie. Grand Rapids, Michigan: William B Eerdmans, 60.

²⁴Oreskes, “Beyond the Ivory Tower: The Scientific Consensus on Climate Change.

Section II

International Mountain Issues



Mountain Conflicts: The Ferghana Valley

By Alexis Sagen

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Kyrgyzstan's intense mountain scenery, ideal for hiking and snowboarding, has acted as a lure for tourists and has earned Kyrgyzstan the enchanting title of the "Switzerland of Central Asia."¹ These very mountains, which have been helping to drag Kyrgyzstan out of the impoverishment it has suffered from since its creation after the dissolution of the Soviet Union, may be the cause of many of the majority of Kyrgyzstan's economic, social, and political problems. These mountains could be playing a key role in facilitating an atmosphere of conflict and violence in Kyrgyzstan, and in the Ferghana Valley in particular.

A series of violent riots in Kyrgyzstan in June of 2010 left many hundreds dead and possibly thousands injured. The independent Kyrgyzstan Inquiry Commission (KIC) estimated that 470 were killed and 1,930 injured.² These numbers are far from conclusive however, as estimates have extended the number of fatalities alone to as high as one thousand persons.³ These riots were said to have been triggered by a fight at a casino in Osh which quickly spread into the neighboring town of Jalalabad, and was further complicated by rumors of rape, as well as conspiracy theories which claimed that the riots were instigated by Kyrgyzstan's organized criminal gangs in an attempt to create instability after the revolution which occurred only two months previously.⁴ A simple bar fight could not of course have been the cause of such an outbreak of violence. The bar fight was merely the final drop of water that finally burst a dam that had been filling for years.

Who is to blame for instigating the June riots is a topic under hot debate as both sides have been pointing their finger at the other, calling itself the victim and demanding reparation. The official position of the Kyr-

¹"Investment Guide to the Silk Road." *United Nations Conference on Trade and Development*. (2009). http://www.unctad.org/en/docs/diaeia20096_en.pdf, 41.

²Rickleton, Chris. "Kyrgyzstan: Are Guns the Political Weapon of Choice?" *Eurasianet.org*, June 9, 2011. <http://www.eurasianet.org/node/63655>.

³Pannier, Bruce. "Kyrgyzstan: Anatomy of a Conflict." *Eurasianet.org*, July 3, 2010. <http://www.eurasianet.org/node/61457>.

⁴Pannier.

Sidorenko, Alexey. "Kyrgyzstan, Uzbekistan: Initial Coverage of the "Osh Massacre." *Globalvoicesonline.org*, June 13, 2010. <http://globalvoicesonline.org/2010/06/13kyrgyzstan-uzbekistan-initial-coverage-of-the-osh-massacre/>.

gyz government, and to a large degree the ethnic Kyrgyz themselves, is that Uzbek separatism was what started the conflict and resulting violence. International opinions on the matter differ, and many states are inclined to side with the Uzbeks and see the conflicts as the Kyrgyz majority discriminating against the ethnic Uzbek minority. Supporting the latter claim are investigations such as one performed by the KIC which found the death toll of the riots to consist of 74 percent of ethnic Uzbeks compared to 24 percent ethnic Kyrgyz.⁵ The KIC and a further study by the Human Rights Watch uncovered numerous offenses against Uzbeks by the Kyrgyz government such as direct assaults, arbitrary arrests, imprisonment, torture, and false guilty verdicts of Uzbeks (Uzbeks are accused of murder 30 percent more often than Kyrgyz) by the army and authorities.⁶ Kyrgyz also suffered from such treatment, but in fewer numbers. Similarly, gang rape of women was perpetrated on both sides, but most often against Uzbek women, with most of these cases having gone unpunished. Regardless of who is to blame, unequal treatment of either party by the other will only increase the ethnic tension between them.

Violent outbursts such as these demonstrate the deep seated animosity which has been building up between the Kyrgyz and Uzbeks over many years. Rather than being based on pure ethnically based differences such as race or cultural beliefs and practices, the tension between the ethnic Kyrgyz and ethnic Uzbeks can be easily traced back to class conflict over rights and privileges, and fights over resources such as land and water. According to Bruce Pannier in his article “Kyrgyzstan: Anatomy of a Conflict:

Uzbeks make up approximately 15 percent of Kyrgyzstan’s population but account for nearly one-third in the country’s southern regions. Inter-marriage is rare and business partnerships infrequent. Uzbeks, who predominantly live in urban areas in the south, are underrepresented in the government and complain of being treated like second-class citizens. Kyrgyz, who live mostly in rural areas, complain that Uzbeks dominate the commercial sector.⁷

A similar story is told by David Stern, who claims that, “Before

⁵“Kyrgyzstan: Officials Still Targeting Uzbeks with Violence – Independent Inquiry.” *eurasianet.org*, May 3, 2011. <http://www.eurasianet.org/node/63405>.

⁶Ibid.

Khamidov, Alisher. “Kyrgyzstan: Remembering Osh Violence Without Reconciling.” *eurasianet.org*, June 10, 2011. <http://www.eurasianet.org/node/63661>.

⁷ Pannier.

this most recent outbreak, Uzbeks could be heard complaining that Kyrgyz held all political power and did not respect their ethnic rights. Kyrgyz for their part said that all the main businesses belonged to Uzbeks and that they were always pushing for extra influence.”⁸ Stern quotes Mukhabat Kurbanalieva, a Kyrgyz trader at a local bazaar, writing that “It’s been simmering and simmering for a long time now. All the owners are Uzbek, and all the workers are Kyrgyz.”⁹

Relations between these two ethnic groups have not always been bad however, and even today, many Uzbeks and Kyrgyz coexist peacefully. According to Kanykey Jailobaeva, a southern Kyrgyz who travelled across southern Kyrgyzstan after the riot, the communities in Kyrgyzstan in which the Uzbeks and Kyrgyz have interacted peacefully through intermarriage, friendship, and economic transactions which create interdependence within the community, have remained relatively stable and the residents have remained on good terms.¹⁰ In the hope of either restoring or initiating good relations between these groups, some local officials have organized athletic competitions and holiday celebrations.¹¹ On a wider scale, the Kyrgyz government has offered benefits to Uzbeks and Kyrgyz who intermarry, sending two clear messages; that the government wants reconciliation and integration, and that it is oblivious of the true situation in the Fergana Valley and the complexities of the ethnic tensions boiling there which make this plan unlikely to resolve any of the deep-seated problems of this troubled valley.

After seceding from the Soviet Union in 1991, Kyrgyzstan wasn’t able to advance into a healthy democracy, but instead became a relatively backward state compared to the surrounding states of the Central Asia. It was after the fall of the Soviet Union that Kyrgyz-Uzbek relations began to deteriorate, as the ethnic Uzbeks began to become business and land owners, while the ethnic Kyrgyz fell to the level of the working class. Ethnic and class tensions came to a boiling point in the city of Osh first in 1990, in a riot which resulted in over 300 fatalities and 1000 wounded from both groups, and then again in June of 2010 which led to the masacre and subsequent banishment of the Uzbek population resulted.¹² It is

⁸Stern, David. “Kyrgyzstan: Surviving Ethnic Conflict.” Globalpost.com. June 17, 2010. <http://www.globalpost.com/dispatch/asia/100617/kyrgyzstan-news-ethnicconflict>.

⁹Ibid.

¹⁰Jailobaeva, Kanykey. “From Within Kyrgyzstan.” *Scotland-Russia Forum Review* (December 24, 2010): 4-5,5.

¹¹Khamidov.

¹² Jailobaeva, 5.
Sidorenko.

notable that both these conflicts occurred in a city located in the southern section of Kyrgyzstan in what is called the Ferghana Valley, which is itself divided into sections of the three states of Kyrgyzstan, Uzbekistan, and Tajikistan.”¹³ This section of Central Asia, home to approximately eleven-million people, has been acknowledged as a basin of ethnic tensions and strife which has been further exacerbated by state borders drawn during the years of the Soviet Union which didn’t and continue not to adhere to the ethnic boundaries of this highly diverse region.¹⁴ The city of Osh itself is home to a large population of ethnic Uzbeks, with the population of Uzbeks almost equal to that of Kyrgyz before the forced exodus of the ethnic Uzbeks from the region after the riots.¹⁵

The question immediately poses itself: why is the Ferghana Valley, and the cities of Osh and Jalalabad in particular, such a hotbed for ethnic tension and violent conflict? This issue has been addressed from various angles such as ethnic conflicts, land disputes, and ineffective government, but no one has yet traced these causes to *their* common source; the environment and physical landscape of the Ferghana Valley. While it has been commonly acknowledged in the media and scholarly works, that these ethnic tensions are in large part due to the economic and political landscape in which these two groups of people are dwelling, the matter of the PHYSICAL landscape’s role in creating and exacerbating these issues has been largely vacant from discussion. One scholar who has brought this topic into the light is Frederick Starr. In his article “Conflict and Peace in Mountain Societies” which he composed for the Bishkek Global Mountain Summit, Frederick Starr began with the startling assertion that “with few exceptions, the most numerous and obdurate conflicts in the world today occur in mountain zones.”¹⁶ Although a slightly older figure, “in 1999, 23 of the 27 major armed conflicts around the world took place in mountainous regions.”¹⁷ This figure is far too large to be a mere coincidence, but deserves analysis into the variables that make violent outbursts so much more likely in mountain regions than in the lowlands.

In support of his unprecedented theory, Starr argued that mountain conflicts tend to contain similar elements which conflicts in non-mountainous regions Jack:

¹³Sidorenko.

¹⁴Sidorenko.

¹⁵Stern.

¹⁶Starr, Frederick. “Thematic Paper C2, Conflict and Peace in Mountain Societies.” Bishkek Global Mountain Summit. (August 13, 2002), 1.

¹⁷Ospina, Guillermo Andres. “Mountains in the Context of War in Colombia: Some Geopolitical Considerations.” *Mountain Research and Development*, 26, no. 1 (2006): 90-91, 91.

- Mountains are stuck between the isolation of their environment and integration into the larger society through modern technology which allows mountain resources to be exploited by lowlanders, often without the consent of the mountain-dwellers.
- Mountain regions possess a “distinctively modern type of poverty,” which is caused by the increased reliance of the mountain-dwellers on the resources of the lowland instead of on their own environment.
- Most governments find little incentive to fight poverty in the mountains because mountains tend to be scarcely populated areas far from major centers of society, and are often located on the borders of countries and so are seen simply as “security zones”.
- The forms of modern communication technology which have become available to many mountain peoples, allows the impoverished mountain-dwellers to see the riches of the wider world and become discontent with their lot.
- In order to draw in outside markets, mountain-dwellers have increasingly decided to stop cultivation of their traditional crops in favor of money bringing crops such as poppy for opium or coca plants, creating some wealth in these desperate communities, but has also increased contact with the criminal underworld the stimulated formation of violent gangs.
- Mountain peoples possess a “psychology of victimhood”, which exists in many mountain communities created by the realization of mountaineers of their relative poverty.
- Ineffective governments result in criminal gangs and warlords filling the vacuum of power in the mountains and milking these areas for the little wealth they possess through the demand for “protection money” in exchange for some degree of protection.
- Radical secular and religious groups and extremist ideologies thrive in this environment of poverty and criminal activity, uninterrupted by government interference. Fueled by monetary support from criminal transactions and international funding from supporters abroad, revolutionary groups don't only promise the transformation of society, but also “offer generous financial support for their recruits in the form of free training, aid for families, and employment.”
- The level of seriousness necessary for most governments to involve themselves in mountain conflict, means that the conflict has already risen to crisis level where civil society has been seriously interrupted, and so the mountain regions becomes a “security problem” for the governments who consequently send military troops to quell the unrest. These troops, Starr asserts, generally make the conflict worse, not better, by bringing ever more lethal armaments into the conflict which are often seized by the

rioters, militarizing the mountain region and intensifying the conflict so that “the army becomes just one fighting force among many.” Starr argues that “in the end, social and economic breakdown is complete and becomes all but irreversible.”¹⁸

Finally, Starr concludes that none of these conditions are unique to the present age but can be traced back to conflicts in the nineteenth and twentieth centuries. Starr said that “what is distinctive to our era is that all of these features now regularly occur together, and in a compressed time period, which renders them all the more potent.”¹⁹ By using the criteria that Starr listed, this article will assert that it is indeed Kyrgyzstan’s mountainous topography that has in large part created the economic and social problems in the Ferghana Valley, and it will build on Starr’s work by suggesting further factors relating to mountain regions such as vulnerability to environmental change, pollution, unhealthy patterns of migration, and the psychological effects of high altitude on the brain. It will then argue that these factors together have led to the bitterness and resulting violence between the highlander Kyrgyz and the lowlander Uzbeks.

I would like to begin with the issue of property rights in Osh as the first foundation of the riots which can be traced back to highlander-lowlander disputes. Besides the location and ethnicities involved, one of the most striking similarities between the riots of 1990 and 2010 is that they were both conflicts over property rights between ethnic Kyrgyz and Uzbeks groups.²⁰ The 1990 Osh riot was incited by a land dispute between Kyrgyz and Uzbeks.²¹ In the November after the June riots, roughly 1,000 Kyrgyz attempted to seize seventy hectares of farmland near Osh from Uzbeks who have owned the leases for the farmland since 1991, but were driven off by the authorities.²² Despite promises, the Kyrgyz government has done little to resolve the latest land dispute.²³ Projects the government has put in place involve the building of apartments, and the distribution of approximately 31,200 land plots (0.06 hectares per person), but these efforts will most likely not suffice to stop these disputes as there are over 63,000 claimants for this land.²⁴ The source of the land disputes can be

¹⁸Starr, Frederick. “Altitude Sickness: Poverty and Violence in the Mountains.” *National Interest*, 90, no. 65 (Fall 2001): 90-100.

¹⁹Ibid., 7.

²⁰Jailobaeva, 5.
Sidorenko.

²¹ “Kyrgyzstan: Land in Short Supply around Osh.” *eurasianet.org*, April 13, 2011. <http://www.eurasianet.org/node/63289>.

²²Ibid.

²³ Ibid.

²⁴ Ibid.

traced back to “the social and economic complications generated by the steady migration of rural highlanders into Ferghana Valley villages and cities.”²⁵

Rural mountain areas have been having an increasing amount of out-migration in the recent years to the pull of urban areas and the jobs they offer. Migrants work in the cities, some within their own countries and some abroad, either on a seasonal basis or for extended periods of time, and send a steady flow of money back to their families who they left behind in mountains. The remittances that the migrants send make up a significant portion of all the wealth circulating through mountain regions. In fact, for the mountainous province of Gorno-Badakhshan in Tajikistan, remittances constitute 50-60 percent of the basic income for most households.²⁶ Using the same example of Gorno-Badakhshan immigrant laborers, it has been shown that these immigrants, even the well-educated ones, can usually only find low labor positions, and so provide the cities with a cheap source of labor, receiving only about “20%–30% of the usual salary earned by their local competitors.”²⁷ Outmigration to places like Russia and Kazakhstan is also common practice as migrants search for a better life. Insecure borders facilitate the easy migration of these workers across the border, but create numerous legal difficulties.²⁸

Tensions naturally arise between the natives and the immigrants who are coming and competing for resources, housing, jobs, and salary, often for an extended period of time and in ever greater numbers. Another source of tension caused by immigration of rural mountain dwellers to urban areas is the shift this migration causes in the male population. “In the past 5 years, more than 22% of the male population of Gorno-Badakhshan province left their families and only 2% returned for a temporary stay.”²⁹ It has been a long known fact that when a disproportionate number of young men congregating in one place, tension and violence rise in that area. What can one expect when a large population of young men leave their home, knowing that they will most likely not be back for many years, and finding on entering the city, that they are unwanted, discriminated against, and can only receive a salary a fraction of what the natives receive; barely enough to cover essentials much less be used to progress in the world? What is

²⁵ “Kyrgyzstan: Land in Short Supply around Osh.”

²⁶ Olimova, Saodat, and Muzaffar Olimov. “Labor Migration from Mountainous Areas in the Central Asian Region: Good or Evil?” *Mountain Research and Development*. 27, no. 2 (May 2007): 104-108. http://src.auca.kg/pdf/Labor_Migration_from_Mountainous.pdf.

²⁷ *Ibid.*, 105.

²⁸ “Kyrgyzstan: Land in Short Supply around Osh.”

²⁹ Olimova, 106.

worse is that the ones who are apparently receiving the greatest amount of wealth are not even the native Kyrgyz of the area, but the ethnic Uzbek population which owns most of the businesses and property. Tension between the immigrants and native city dwellers, especially the unprotected minority Uzbeks, is a natural and predictable consequence. Thus the desperate situation in the mountains regions forces the young men to leave their native homes and head for the cities, which in turn causes ethnic conflict.

Desperate situations can motivate people to leave home, but that is not the only cause of migration; many governments utilize the practice of forced migration into or out of mountain communities. Forced relocation, when it occurs, is also a source of great conflict in mountain regions and between mountains and flatlands such as in the case of Georgia where many citizens were relocated to the border regions in the 19th century in order to populate those regions, and thousands of mountaineers in the 1930-50s were then relocated down to the lowlands.³⁰ Through their research on Georgian mountains, Trier et al. concludes that:

The influx of ecological migrants in regions populated by national minorities has frequently led to tension. Unfamiliar with local social norms and with a different social and cultural background, eco-migrants have often experienced severe difficulties in integrating into the local communities. Inadequate preparation of the recipient communities has often created suspicion and mistrust against the newcomers. Consequently, poor relations between natives and newcomers have frequently developed as a result of these settlements.³¹

Kyrgyzstan's under protected borders and lack of government planning and restructuring after Kyrgyzstan's transition to statehood has contributed to conflict between natives and migrants. After years of loose border regulations, Kyrgyzstan has begun to enforce border patrols, stranding thousands who have crossed the border without proper documentation, able neither to obtain work nor return to their home countries.³² Approximately 17,000 people are living in Kyrgyzstan today who are classified by the United Nations High Commissioner for Refugees (UNHCR)

³⁰Trier, Tom, and Medea Turashvili. "Resettlement of Ecologically Displaced Persons Solution of a Problem or Creation of a New? Eco-Migration in Georgia 1981 – 2006." ECMI Monograph, 4

³¹ Ibid.

³²"Kyrgyzstan and Uzbekistan: Stateless "Border Brides" Caught in Between." *eurasianet.org*, February 17, 2012. <http://www.eurasianet.org/node/65019>.

as “stateless.”³³ Osh Province has over 3,000 Uzbeks without proper passports who cannot obtain residence permits, which are needed to get either migrant status or Kyrgyz citizenship, due to their lack of a valid passport.³⁴ The majority of stateless people in Kyrgyzstan are mainly Kyrgyzstanis, who simply did not renew their documentation after the fall of the Soviet Union, but many are also undocumented Uzbek women who married ethnic Uzbek men from southern Kyrgyzstan, known as “border brides.”³⁵ Many of these women and other Uzbek citizens have been settled in Kyrgyzstan for decades but no regulations exist to help these them to become nationalized or even to be able to return to Uzbekistan.³⁶

Fights for resources often occur between less densely populated mountain villages and increasingly densely populated cities at the base of the mountains. One resource that many mountain regions house in abundance and the lowlands need desperately, and thus which causes many disputes between the highlands and the lowlands over its control, is water. Mountains are the world’s water towers. In other words, most of the world’s fresh water comes from the mountains from precipitation, and ice and snow melt (approximately 90 percent of fresh water is in ice form), and because major rivers all have their origins in mountains.³⁷ In dry areas, mountains provide 70-95 percent of water in the lowlands by their runoff, and in humid areas, mountains still provide 30-60 percent.³⁸ Lowlands are thus dependent on the mountains for their water supplies, but at the same time, mountain regions are often unable to use this resource to their advantage as water naturally flows downhill. Global climate change, pollution, and growing populations have resulted in a great strain on mountain water supplies around the world: “at the global scale, it is estimated that approximately one in three people live in regions of moderate-to-high water stress and that two-thirds of people will live in water-stressed conditions by 2025.”³⁹

Due to the vitality of water to life, fierce conflicts often evolve around its acquisition, especially in times of draught. Kenya is one such

³³ “Kyrgyzstan and Uzbekistan: Stateless “Border Brides” Caught in Between.”

³⁴ Ibid.

³⁵ Ibid.

³⁶ Ibid.

³⁷ Iyngararasan, Mylvakanam, Li Tianchi, Surendra Shrestha, P.K. Mool, Masatoshi Yoshino, and Teiji Watanabe. “The Challenges of Mountain Environments: Water, Natural Resources, Hazards, Desertification, and The Implications of Climate Change.” *Key Issues in Mountain Regions*. Edited by Martin F. Price, Libor Jansky and Andrei A. Iatsenia. New York: United Nation University Press, 25.

³⁸ Ibid.

³⁹ Ibid.

country that has been experience tensions between the highlands and lowlands because of the ever growing need for water in increasingly populated and developing areas at the foot of mountains, and an ever dwindling water supply as mountain springs are forced to supply both highland and lowland communities.⁴⁰ Talking about the water conflicts in Kenya today, Wiesmann et al. asserted that:

These water-related conflicts are not expressed as expected in social and political terms. The potential water conflicts between agro-pastoralist communities and the large-scale water users on the slopes of Mt. Kenya are rarely expressed due to the political and economic dependency of smallholders on actors in these more powerful categories. The conflicts in the upper catchment are expressed between single agro-pastoral communities along the courses of the tributaries as well as between the different socioeconomic strata within the communities. In addition, potential conflicts between upstream and downstream users are not expressed primarily as water conflicts but have developed into ethnic tensions, in which customary land-related issues and cultural differences may break out in the form of violent clashes.⁴¹

Kyrgyzstan consumes 10 percent of the waters of the Syrdarya River despite the fact that 75 percent of the waters from the river are formed within Kyrgyzstan. Kyrgyzstan also has to shoulder the burden of maintaining its water supplies (an annual cost of 25 million USD), with little to no compensation from Uzbekistan or Kazakhstan. Land is also an issue with the water reserves. Twenty-eight thousand acres of Kyrgyzstan's land, for example, was flooded for the Toktogul water reservoir. Kyrgyzstan *did* pass a law in 2001 claiming the rights to the water resources and facilities produced inside of Kyrgyzstan and stipulating a cost-share method of funding for the water facilities, but Uzbekistan and Kazakhstan have proven reluctant to abide by this law and fully compensate Kyrgyzstan for the use of its water supplies.⁴²

⁴⁰Wiesmann, Urs, Francis Gichuki, Boniface P Kiteme, and Hanspeter Liniger. "Mitigating Conflicts Over Scarce Water Resources in the Highland-Lowland System of Mount Kenya." *Mountain Research and Development*, 20, no. 1 (2000): 10-15.

⁴¹Wiesmann 12-13.

⁴² "Management of Water Resources in Kyrgyzstan." *Waterwiki.net*. October 17, 2009. http://waterwiki.net/index.php/Management_of_Water_Resources_in_Kyrgyzstan.

The natural and justifiable need for water is becoming complicated by pollution and environmental changes which affect mountain regions particularly harshly, and the effects of which trickling down to the valleys. Gold, as an important resource for Kyrgyzstan's economy, is one area of contention due to the destructiveness of mining practices on the mountainscapes of Kyrgyzstan; destroying soil and polluting water sources. The gold market cannot be gotten rid of as a full 1/3 of Kyrgyzstan's exports are comprised of gold mined mainly from its mountains.⁴³ Kyrgyzstan's mountain areas not benefiting from its gold trade however, as environmentally detrimental mining practices started at the time of the Soviet Union continue to be practiced in Kyrgyzstan, gold mining is a daily source of fear and contention. The radioactive waste left over from Soviet time practices has left scars on many Kyrgyz towns including Min Kush, which continues to sell coal that may be radioactive despite its 70 percent rate of unemployment.⁴⁴ To demonstrate the continued prevalence of environmentally detrimental mining practices despite government regulatory legislation meant to eliminate such practices, one has only to look to Kumtor, the largest gold mine in Kyrgyzstan, making up 54 percent of Kyrgyzstan's industrial output, 12 percent of its GDP.⁴⁵

Kumtor's mining and unsafe chemical storage has created heavy metal pollution in the water around the mine, which has led to health problems in humans and a decrease in the fish supply. Kumtor has been allowed to continue its activities despite the fact that the "Kyrgyz government controls one-third of Centerra, which has a 100-percent stake in Kumtor."⁴⁶ This is creating a far reaching problem, as a large portion of Central Asia is reliant on now polluted mountain runoff for their water supply, as well as being in need of the fish population for sustenance. Just like water, pollution runs downhill. Further pollution of this water supply could add to the competition over water sources already taking place in Kyrgyzstan, fuelling tensions between mountain-dwellers and lowlanders.⁴⁷ Kumtor mining activities have recently ground to a halt due to strikes demanding not environmental reform, but the return of money apparently took by the

⁴³ "Investment Guide to the Silk Road," 49.

⁴⁴Trilling, David. "Kyrgyzstan: Radioactive Coal Scandal Eclipses Older Radioactive Woes." *eurasianet.org*, February 06, 2012. <http://www.eurasianet.org/node/64960>.

⁴⁵Trilling, David. "Kyrgyzstan: Gold Mine Could Exacerbate Central Asian Water Woes—Report." *eurasianet.org*, January 31, 2012. <http://www.eurasianet.org/node/64928>.

⁴⁶ Ibid.

⁴⁷ Ibid.

company from its employees' salaries to give to the state social fund.⁴⁸

Poverty, another factor on Frederick Starr's list, is a continuing problem in Kyrgyzstan which only adds to discontent, especially between the haves and the have-nots. According to Starr, 60-80 percent of people dwelling in mountain regions are living below their country's poverty level.⁴⁹ High levels of poverty lead to discontent and frustration. Such frustration can naturally lead to outbreaks of violence against who have what the frustrated mountain-dwellers lack, namely the lowlanders. Starr describes the situation of poverty often found in mountain regions:

Abysmally poor roads, undeveloped or nonexistent rail systems, and lack of air service deepen their natural isolation. Electricity is often absent, as are basic sanitation, public health and education. Telephones are few and unreliable, even in district centers, and postal service is slow. Despite their isolation, or perhaps because of it, mountain peoples have been shortchanged in all the infrastructures needed to participate in the modern world.⁵⁰

Outdated infrastructure has been causing mass power outages all over central Asia, and in Kyrgyzstan in particular and unusually cold winters have kept mountain ice frozen so that energy grids, that run off the flow of melting mountain ice, cannot function. Protesters congregated to demand their power back, blocking of roads, reminiscent of the protests that help to throw President Kurmanbek Bakiyev out of power in 2010. The power produced in southern Kyrgyzstan must first travel through Uzbekistan and Kazakhstan before it is able to reach the north of Kyrgyzstan, and recent energy disputes between Uzbekistan and Kazakhstan have threatened the security of northern Kyrgyzstan's power supply even further. One estimate says that "in the worst-case scenario, 40 percent of customers in northern Kyrgyzstan would face severe electricity shortages."⁵¹

Poverty is supported and deepened by a poor education system in Kyrgyzstan. Despite the misleadingly optimistic figure of a 98.7 percent literacy rate for people over fifteen in Kyrgyzstan in 2007.⁵² [T]he 2010 worldwide survey of the reading, math, and science skills of fifteen-year

⁴⁸"Centerra Says Kyrgyz Gold Mine Shut Down." *Radio Free Europe Radio Liberty*, February 15, 2012. http://www.rferl.org/content/kyrgyzstan_gold_mine_/24484424.html.

⁴⁹Starr. "Altitude Sickness: Poverty and Violence in the Mountains," 93.

⁵⁰Ibid.

⁵¹Schenkkan, Nate. "Central Asia: Struggling to Keep the Lights On." *eurasianet.org*, January 31, 2012. <http://www.eurasianet.org/node/64930>.

⁵²"Investment Guide to the Silk Road," 30.

olds in various countries by the Program for International Student Assessment (PISA), ranked Kyrgyzstan in 65th place; dead last.”⁵³ Over 80 percent of fifteen-years olds in Kyrgyzstan are below the “baseline level of proficiency, at which students begin to demonstrate the reading literacy competencies that will enable them to participate effectively and productively in life,”⁵⁴ performing almost equally poorly in math and science, with urban students performing two years ahead of their rural peers. Bulgaria, Hungary and Panama, also mountainous countries, also showed Kyrgyzstan’s peculiar pattern of higher performance rates in cities.”⁵⁵ Tajikistan, a country even more mountainous than Kyrgyzstan, was not tested, but it has been argued that it would have performed even poorer than Kyrgyzstan if it had participated. Low salaries for teachers have also resulted in a strike by high school teachers, and the subsequent promise of higher salaries.”⁵⁶

Nationalism seems to be on the rise in Kyrgyzstan. On the order of their President, Kyrgyzstan’s government is in the process of promoting greater national pride after the riots by changing Russian place names into their original Kyrgyz. In so doing, they hope to “protect their country from irredentist Russian claims,” raising the tension perhaps between the Russian minority and Kyrgyz populations.”⁵⁷ In addition to name changes, the Russian language is being suppressed and Kyrgyz promoted through so called “language-police raids” which were carried out on the order of local officials in Osh shortly after the riots, in order to confirm whether or not local businessmen, many of whom were Uzbek, were writing in Kyrgyz.”⁵⁸ This style of nationalism appears to represent a deep seated fear of foreign influence due to Kyrgyzstan’s position as a new and divided state and is likely to lead not to greater unity, but to a greater degree of violence and ethnic tension.

According to Kanykey Jailobaeva, a southern Kyrgyz, in her article “From Within Kyrgyzstan” written for the December 2010 *Scotland-Russia Forum Review*, “social and political factors must be taken into account.” When comparing Kyrgyzstan other central Asian states, Kyrgyzstan’s government has been weak, corrupt, and unable to provide the necessary infrastructure, social services, or employment to help its economy which has been developing at a sluggish pace. In consequence of this,⁵³Yefimov, Natasha. “Kyrgyzstan Ranks Last in Major Education Assessment.” *eurasianet.org*, December 13, 2010. <http://www.eurasianet.org/node/62558>.

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ Ibid.

⁵⁷ Trilling, David. “Kyrgyzstan Wants Putin, But Not His Language.” *eurasianet.org*, February 10, 2011. <http://www.eurasianet.org/node/62870>.

⁵⁸ Ibid.

the Kyrgyz have become increasingly discontent, and the poorest regions, such as southern Kyrgyzstan in the Fergana valley, have been acting out violently⁵⁹. Using Starr's criteria, these problems that Kyrgyzstan currently faces can be understood through its geographic location.

For example, security issues, which are caused in part and then further exacerbated by government's sluggish and inadequate responses, are major contributors to violence in Kyrgyzstan. Kyrgyzstan is currently home to hundreds if not thousands of firearms which were stolen by civilians during the riots and two month earlier during the uprising against Kyrgyzstan's leader, Kurmanbek Bakiyev.⁶⁰ Drug-trafficking routes from Afghanistan which cuts through the Tajikistan and Kyrgyzstan boarder have let many more firearms into the country.⁶¹ From this information, it is clear that the mountain regions bordering Kyrgyzstan which participate in the illegal weapon trade, and Osh and Jalalabad in particular as further weapons were seized during the riot, have a particularly high number of guns in the hands of citizens. According to the independent Kyrgyzstan Inquiry Commission (KIC), approximately two-thirds of the 470 killed and half of the 1,930 injured in the riots had been shot. It is not the point of this article to argue the ups and downs of gun possession.⁶² I will argue only that it is obvious that guns *do* exist in great number in these cities, and that these guns were used during the conflicts. The government has been largely unable to control the flow of firearms into the cities, especially considering it is in large part their own weapons being stolen. Based on interviews performed by the KIC of both Kyrgyz and Uzbeks, many soldiers surrendered their guns and armored vehicles suspiciously easily to Kyrgyz mobs.⁶³

In addition to practical hardships caused by high elevation, there are also real physiological changes that can take place in the human brain when it is exposed to high altitude environments which can lead to psychological disorders such as depression. Recent studies in the field of psychology have found a positive correlation between high altitude and suicide, suggesting that the very altitude of mountain environments can lead to mental strain and depression. A study by Dr. Barry E. Brenner of the suicide rates of 2,584 counties across the US from 1979-1998 has revealed a clear correlation between high elevations (around 2,000 to 3,000

⁵⁹ Jailobaeva, 4.

⁶⁰Rickleton.

⁶¹Rickleton.

⁶² Ibid.

⁶³“Kyrgyzstan: Officials Still Targeting Uzbeks with Violence – Independent Inquiry.”

ft.) and higher rates of suicide. This finding was supported by a second study led by Dr. Perry F. Renshaw, which determined that the states of Montana, Idaho, Wyoming, Utah, Colorado, Nevada, New Mexico, Arizona and Oregon, which have some of the highest altitudes in the US, are also listed as nine of the ten states with the highest suicide rates in the US. Neither of these studies was able to determine a clear cause of the higher suicide rates, but Dr. Brenner and his team said the cause may be as simple as the higher rates of obesity, sleep apnea, or hypoxia in mountain regions. Regardless of the factors that contribute to these exaggerated suicide rates, it is clear from these two studies that the high altitudes in these mountainous regions is an independent factor contributing to this problem.⁶⁴

As can be seen in [a] Ferghana elevation map, the cities of Osh and Jalalabad in which the 2010 riots took place are both well within the 2000-3000 ft. boundary above which higher suicide risks occur. As suicide is often caused by depression, and depression can lead to violence, it is not a far cry to suggest that the high elevations helped to create the critical situation in the Ferghana Valley. While it would be ridiculous to claim that violence in mountain regions is caused by some sort of a mass hysteria brought about by high altitude, it is not out of the realm of possibility that higher depression rates play a small role in pushing the mountains towards violence. People suffering from depression, for example, may not be able to perform their jobs properly, contributing to the problem of poverty. Depression can also lead to the “psychology of victimhood” that Frederick Starr diagnosed mountain areas with; depressed people may be more likely to feel themselves victimized by society, and so may be more willing to lash out against them. It is difficult to imagine in any case, that such high levels of depression in the mountains would have no negative effects on society at all.

Through this analysis, I hope it has become evident that Frederick Starr’s criteria for the similarities between mountain conflicts are present in the riots that have taken place in Osh, as well as being present in the general tensions and conflicts that have been slowly eating away at the Ferghana Valley. I have explained this violence in terms of rivalries formed between highland Kyrgyz and lowland Uzbeks as the two fight over resources, property, jobs, social status, political control, and water sources. These rivalries have led to conflicts that have until this point been written off as mainly ethnic conflicts. These ethnic conflicts are, I would

⁶⁴Mozes, Alan. “High Altitude Linked to Higher Suicide Risk -- Again: Expert Says it Appears ‘Pernicious’ For Those Who Are Depressed, But No One Yet Knows Why.” *Bloomberg Businessweek*, January 19, 2011.

argue, merely the manifestation of a real rivalry brought about by the environment in which these two groups coexist. Frederick Starr's research on conflict in mountain communities has helped to bring the growing issues of violence in mountain regions into debate and discussion, but much work is still left to be done in order for these conflicts to be better prevented and resolved. One aspect of mountain conflicts that needs to be delved into further is the problem I have only managed to touch on in this paper; the rivalries and conflicts between highlanders and lowlanders.

The city of Osh is only a small example of a larger pattern of behavior that can be observed between highlanders and lowlanders around the world. This issue will become of greater and greater importance if mountain areas continue to suffer environmental degradation on the scale they have been enduring in recent years, causing resources in the mountains, especially water sources, to become polluted and diminished. Only when the issue of highlander-lowlander conflict is recognized as vital for the functioning of the whole community, can political and social changes be implemented and the path toward recovery and reconciliation be started upon.

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An Andean Perspective

By Will Welch

Willie Welch III, is a non-traditional student at Utah Valley University, studying Environmental Management and Marketing. He has worked in the personal financial industry for fifteen years and served in the US Navy and the Army Guard. Welch is married with two daughters, who attend Utah Valley University as well. He is currently working as a broker for currency exchange and commercial banking transactions, to help fund projects in Latin America. Welch has been involved in studying solutions to the Altiplano environmental problems and focusing on the change of Lake Titicaca. He feels solutions lie with studying sustainable approach to cleaning Lake Titicaca and the cities of the Altiplano.

The Andes mountain range runs over 8000 km, the length of South America, with an Area of 2,500,000 km², 33 percent of the total country areas. With the population of 85 million total including all the countries that are in the Andean corridor, making the Andean region the most populated mountain areas in the world. The Andes are very diverse and heterogeneous area, in terms of cultures, biodiversity and economic systems, with large differences between countries.¹

This mountain region affects the water systems, agriculture systems, hydroelectric and mining. The Andes themselves feed one of the largest river systems, the Amazon River. The Andes also are home to three of the poorest countries in South America: Ecuador, Peru and Bolivia. The poorest of all is Bolivia, \$1,973 (GDP per-capita 2010 current USD) population of 6,818,530 with 61 percent living in urban areas in the Andes.² With a large population living in cities in the mountains the sewage water problem and basic services are a struggle every day for these cities. Solutions to their problems and needs will come from ingenuity in using technology and using the topography to their advantage.

La Paz and El Alto are two sister cities, the first is over 500 years old (La Paz) in a lower basin and El Alto sits above La Paz on the altiplano of Bolivia. El Alto is a new city that has grown so fast that not all areas have sewers and running water. People from rural areas have rushed to La Paz looking for work and opportunity and have created an environmental tragedy.

La Paz population is 732,000 and El Alto is 962,097. The Alto went from 60,000 people in 1970 to almost one million in 2010.³ The environmental impact itself on sanitation and basic services were stretched

¹Mountain Partnership/CONDESAN. *Sustainable Mountain Development*. PHD Multiple. Various. San Borborja: Swiss Agency for Development and Cooperation, 2011. Document.

²Ibid.

³ Ibid.

to the max or even nonexistent at times. There has even been a cholera outbreak at the end of the 80s and early 90s.⁴

These two cities are trying to catch up with sewage systems for the populations of each perspective city. The biggest need has been being able to obtain funding for basic infrastructure projects. El Alto and La Paz were one city at one time but were separated in the 90s. One problem is cultural differences between the indigenous population and the more affluent and educated class of mestizos more common in La Paz.⁵ Another is tax revenues, in La Paz the people tend to pay their taxes. El Alto populations are very leery in paying because of corruption and also a lack of understanding about why to pay taxes, but the biggest factor is income disparity between both municipalities. La Paz has higher income earners, industry owners and foreigners live in these areas.⁶

La Paz and El Alto have three major problems:

- Not every home or business is connected to a sewer system
- Not everyone has running drinking water in their home
- The sewage system dumps into the river systems that run through both cities without any treatment of any kind.⁷

Homes, business industry and the textile industry are the largest industries dumping in to three rivers but the main river is the Choqueyapu running through La Paz. Another critical polluted site is the Cohana Bay, located in the shallower part of Lake Titicaca. Cohana Bay has waste from the constantly expanding altiplano city of El Alto, threatening local health, livestock, and crops.⁸ The concern is high locally and internationally. People rich and poor ignore the laws that have been passed. Bolivia has some of the strictest environmental laws and even recognizes nature to have basic rights as well. But, enforcement of those laws is a problem with scarce resources and dependency from international community for funding of the Ministry of Environment and Water.⁹ The key to putting together a plan of action is very difficult to say the least. The first key to changing anything is education; an education campaign is a must for all classes and ages. Industry must understand what happens with their consequences of their actions. Some of the biggest culprits are mines on the altiplano, for example the mines of Potosi, that have been around since the

⁴Farthing, Linda. *North American Congress on Latin America*. October 27, 2009. <https://nacla.org/node/6096>.

⁵Ibid.

⁶Foster, Vivien. *Condominial & Water Sewerage System*. Study and Review of Sustainability. World Bank. Lima: World Bank, 2001.

⁷ Ibid.

⁸Farthing.

⁹Ibid.

Incas or even longer. When miners are confronted they become angry and politics is the hammer that makes sure nothing happens in Bolivia. When one party comes to power it removes the people serving in those offices and replaces it with friends of the party. So, soon whatever progress was done by the last group is destroyed or discarded, it's a never ending cycle that must stop.¹⁰

A pilot project was funded by the World Bank in 1998 over a ten year period. This project was for El Alto, it was called condominium sewer system.¹¹ Each home owner connects to a sewer system with a large septic tank that over time would be connect to central sewer system. Each neighborhood or area and home owner is in charge of maintenance and connection. The project had success dropping the ground water contamination and unsanitary conditions that were in the streets. The cost of sewer connection is about \$90 USD and \$45 USD for fresh water connection.¹²

The goal of the water and sewage company is by 2020 to have 98 percent of the homes in La Paz connected to fresh water as well as sewer system. The rain drainage system is connected to the sewer as well. El Alto goals are to have 85 percent sewer connected and 90 percent water, the biggest problem is permitting.¹³ La Paz has standards and norms now but El Alto still with makeshift communities rising up and homes being built on land this is not owned by the builder are very much a problem with makeshift roads and infrastructure still a problem.

El Alto sits at 12,500 feet and La Paz 11,500 feet the next largest city on the altiplano is Cochabamba it is much lower sitting at 8,100 feet.¹⁴ It is called the bread basket of Bolivia. It has temperate climate year round. The rainy season is short but heavy, the dry season is long. Farmers have problems with soil erosion and the soil becoming more salty. The sewage water is released without treatment as well as in La Paz and El Alto; then the farmers use it to grow crops. The same concerns that La Paz and El Alto has, Cochabamba has also with fresh water and sewage. The population is 595,000 and surrounding towns and villages just over one million live in the valley where Cochabamba sits; the valley has the same air pollution problem as Utah County, because of the location of the mountain ranges that block air movement forming sometimes inversions. There is a

¹⁰Farthing.

¹¹ Foster.

¹²Ibid.

¹³Farthing.

¹⁴ Hedstom, Helena, Sofia Cordesius. "Feasibility Study Waste Water Treatment Using Constructed Wetlands." Lunds University Department of Earth and Water Engineering, (March 2009). <http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=1388945&fileId=1388971>.

lake on the other side of the mountain and a main river that runs through the city as well as other smaller rivers that feed the main river. The waste is dumped in this river “Rio Roche”, just as in La Paz and El Alto all waste from homes, industry and hospitals are dumped here and used on the farms down river without treatment.¹⁵

Cochabamba was the location of the famous water war where the people, learning that even the rain water was owned by the water company, rose up against the privatization of the water. Cochabamba is not as poor as El Alto, but nonetheless poor. The cost of water treatment plant is out of reach.¹⁶

University Mayor de San Simon of Cochabamba with the Lund University of Sweden put a pilot project together and they are currently running. This pilot project is in conjunction with a foundation called AGUATUYA. They are looking to decentralized alternatives to conventional wastewater treatment plants. This will be possible by constructing wetlands with horizontal subsurface flow (HSF). This treatment method exists in many parts of the world. The study was performed in November and December 2008 the study includes evaluation of treatment efficiency, also to investigate the application of such a process in Cochabamba.¹⁷

The treatment plant showed 80 to 97 percent reduction in BOD, 80 to 90 percent reduction in COD and 50 to 80 percent reduction in turbidity. The pH and temperature conditions were also favorable for degradation by microorganisms. Nutrients were not observed to be removed from the wastewater, the wetland was largely anaerobic. The microbiological analyses results indicated that fecal coliform bacteria were reduced by 90 percent; this does not meet unrestricted re-use of the water.¹⁸

The wetland tested the use of two different kinds of media, one was plastic the other gravel. The plastic had more surface area but in the test there were little or no difference in treatment efficiency. The concern of the test was that the outlet would need to be redesigned to determine true efficiency. The tracer experiments showed large variation in transport time between gravel and the plastic. Gravel took longer, but exact time for plastic in this test could not be calculated. The normal time was much lower was calculated to be 6.2 and eight days for the gravel and the plastic

¹⁵ Huibers, Frans P., et al. “The Use of Wastewater in Cochabamaba, Bolivia: A Degrading Environment.” CAB International Report. http://web.idrc.ca/en/ev-68340-201-1DO_TOPIC.html

¹⁶Ibid.

¹⁷ Hedstrom.

¹⁸Ibid.

section respectively.¹⁹

Climate and terrain conditions in Cochabamba are suitable for constructing wetlands. HSF wetlands require little energy, construction material and best of all maintenance. Treated water from constructed wetlands can be used for irrigation during the dry season in the vicinity of the wetlands. By doing this strain on potable water, it can be used in the city during this dry season and not in agriculture. This is a great alternative in areas like Cochabamba, having water scarcity and areas with low population; in this case the water could be reused. The Use of constructed wetlands could lead to more green areas with lawns and trees, and this then helps prevent soil erosion, which is a big problem in Bolivia and Cochabamba's farm land.²⁰ This project of constructed wetlands can help produce the needed cleaner water for farming in areas where every drop of water is needed for Bolivia, for sanitation and environmental needs. The altiplano is an area of great need of keeping the current water sources clean. Some areas may be too high to use this cheap alternative, but it's a start.

The problem La Paz has is its location. [A] false wetland would be difficult to build. El Alto could use this process, Lake Titicaca which is about 54km has natural occurring reeds system which even the natives make boats out of. They could install them just out the city and save Lake Titicaca from contamination from the mines, and create wetlands that help clean the environment.

Bolivia's native people, if they would understand how the reeds clean the water and why it is important to create them, they would start to implement these themselves in their small villages and towns and use the water on their crops, because it is in their religion to respect Pachamama (Also known as Earth Mother). This is a viable option for the Andean people to be able to clean the water to be used in these open areas.

Another option for clean water for the area and neighborhoods of El Alto City, Cochabamba and other medium to small outlying areas in Bolivia would be a system made by Water Health International. This is a small water processing plant that can provide clean water for about 10,000 people a day and can be built in twenty days. This filter system has at least four different filters first a multimedia filter; second, it has an activated carbon filter; and third, a reverse osmosis system, forth UV light. This filter system is small but powerful, and is in use in India and Africa successfully today. It has proven result and a onetime cost of about \$25,000

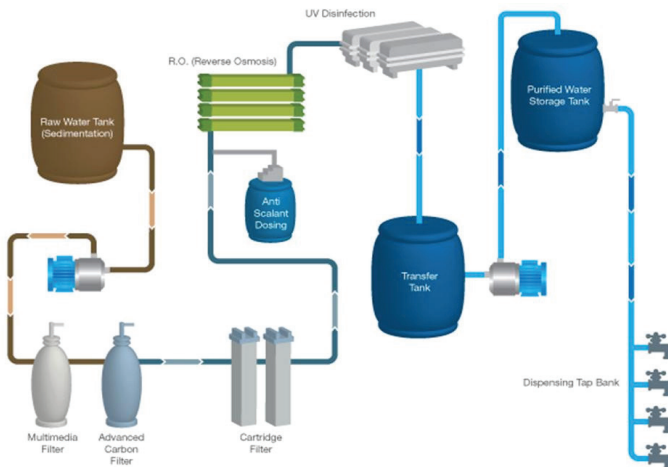
¹⁹Hedstrom.

²⁰ Ibid.

USD for ten years.²¹

All these options do take money which is a real problem for the poorest country in South America. But with education they can implement systems to help clean up their environment, have clean water, and sustainability. It is proven, if people have basic needs met education and economic growth happens. This is a must to help Bolivia out of a cycle of poverty and political instability that has plagued it for over fifty years. The native people of Bolivia in its majority still want to live in the old ways, but cannot sustain the basic needs for healthy life; these technologies can do that. There is hope for them to have their needs met and maintain Lake Titicaca in a better state. Many are illegally built because these are earth movement areas. No water or Sewer.

Water Health System



²¹Water Health International. <http://www.waterhealth.com>.

Women of the Andes: How Secular Education Enhances Women's Health and Society in General

By Jared Martin

Jared Martin is currently obtaining double master's degrees at the University of Utah in Business and Healthcare Administration. He graduated April 2013 from Utah Valley University in Community Health with an emphasis in Healthcare Administration and a minor in Spanish. He has worked in many industries and also completed the Service Scholar program at Utah Valley University in which he completed 300 plus hours of leadership and community service. Martin has always had an interest in community involvement and social impact that took him to Puno, Peru in 2012 where he assisted in the preparation and presented in the Third International Women of the Mountains Conference. He is currently pursuing social impact interests and working through graduate school in order to pursue a fulfilling career in which he can mesh his passions of healthcare administration and social impact.

History of the Inca in Peru

The Incan empire ruled most of modern-day Peru in the years of approximately 1200-1500 B.C. They worshipped the sun god, the Inti, and the earth goddess, Pachamama. The Inca were known for their many artistic and creative capabilities. Britannica Online Encyclopedia said, "The Andean region was once rich and produced high civilizations because, over millennia, its people developed an agriculture, technologies, and social systems uniquely adapted to the very specialized if not unique ecologic conditions in which they lived."¹ The Inca are known by many to possibly be the most advanced group of their time.² The gold used by Inca craftsmen enchanted the Spanish conquistadors from the moment they arrived.³

From the stories one hears about the indigenous people of the past, one may be led to believe that the Inca were a blood-thirsty and savage people. Powers, however, based an entire article on gender equality and the intricate system of politics that the Inca used to become such a sophisticated population in a short period of time. Powers stated, "These were societies in which women and men performed distinct social, political, and economic roles, but roles that were perceived as equally important to the successful operation of the society, whether performed by women or

¹Andean peoples. *Encyclopedia Britannica Online*. <http://www.brittanica.com/EBchecked/topic/23548/Andean-peoples>.

²The Incas. *Peru Travel*. <http://www.peru.travel/en/culture/the-incas-848-2.5.3-2-1685-c4>.

³Bureau, United States. US Department of State. *Background Note: Peru*. <http://www.state.gov/r/pa/ei/bgn/35762.htm>.

by men.”⁴ According to Powers, there were two chief rulers of the people in the Inca Empire: the Inca, who ruled over the men of the empire, and the Coya, who ruled over the women.⁵ He mentioned that the empire was governed as a team with the Inca and the Coya working together to rule over the entire population. Women were viewed as equal to men because of their important roles in sustaining the population as a whole.

Women were rulers over major groups in the Inca Empire in the 1530s when the Spaniards landed on their shores.⁶ The story began to change when the Spanish conquistadors sailed across the Atlantic Ocean and came to the “new world” in search of riches and fame. They came with a different culture, a different religion, a different background, a different way of life. The culture of the Spanish, and possibly all of Europe, at the time of the conquest was that of machismo. Men were praised for bravery in war. Men were given exclusive rights to political and religious power. Powers stated, “According to Spanish law, there existed five levels of authority, all of them restricted to men.”⁷ But why didn’t the Inca fight back? It seems only logical to try and preserve traditions and ways of life. The Inca were in a dilemma. They held high hopes that the Spanish were sent to help the empire. Some tried to fight back, but their clubs and weapons of wood or stone were no match for the Spanish guns and metal weaponry. As they were put under siege, the Inca were forced to surrender their old ways of life and adapt the new Spanish, Christian, lifestyle.

To some, the Christian religion that was imposed upon the people in what is now Peru may be considered to be a benefit. For the women however, it was not. Powers stated,

The church entrusted husbands with the physical and spiritual well-being of their wives, sisters, mothers, daughters, and other female members of their households. As trustees, men had the right to physically punish their female relatives; conversely, women were obligated to subordinate themselves to men and to obey them.⁸

Thus began the rapid decline of women’s power in the Inca and new Indigenous society. Due to the imposition of male dominance by the Spanish conquistadors, the Inca men and women began to follow suit.

⁴Powers, Karen Vieira. “Andeans and Spaniards in the Contact Zone.” *American Indian Quarterly*, 24, no.4 (Fall 2000): 511.

⁵Ibid.

⁶Ibid.

⁷ Ibid.

⁸ Powers, 511.

The power became more and more polarized toward men with each new policy and law implemented within the indigenous population. “This led to an intensification of male privilege and the eventual transition to a gender system that began to resemble, in part, the patriarchy of the Spanish colonizers.”⁹

Now it is the year 2012. Four hundred seventy-seven years have passed since the “official” declaration of Spanish sovereignty by Francisco Pizarro. There are 29,549, 517 people who live in the Republic of Peru, 45 percent of whom are Indigenous. This means that there are over 13 million people Indigenous to Peru.¹⁰ Women comprise more than 50 percent of this population. There is a great need to lend attention to this specific demographic. They make up a large part of the Peruvian population and a majority of them live in the mountainous regions of the country.

Why Women?

Women make up about half of the world’s entire population. In Peru, the ratio leans more towards women than the rest of the world.¹¹ Women have been given the responsibility of childbearing; literally carrying another human life and allowing him or her to come to this world. Women are often in charge of most aspects involved in raising children. Women are generally the people who teach young women and men how better citizens of the world. They have a grand responsibility in their families and society in general. Lucia McMahon wrote a full article on the importance of women in the development of the United States of America. The article was entitled “Of the Utmost Importance to Our Country.” The title is self-explanatory of what is further shown to be a very important aspect of civil and societal development: the woman. McMahon gave somewhat of a formula indicating how a country develops into a strong nation with devoted and rooted citizens. When discussing the many roles of women McMahon said, “...motherhood was only one piece.”¹² She suggested that women are much more than mothers. They are, or should be, active participants in social change and development on all levels of influence. McMahon mentioned that women’s involvement in education can “advance literature - the cultivation of true wisdom,” expand virtue and broaden the mind. She continued to assert that, communication with
⁹Powers, 511.

¹⁰Central Intelligence Agency. United States. *World FactBook: South America: Peru*. <https://www.cia.gov/library/publications/the-world-factbook/geos/pe.html>.

¹¹Central Intelligence Agency.

¹²McMahon, Lucia. “Of the Utmost Importance to Our Country: Women, Education, and Society, 1780-1820.” *Journal of the Early Republic*, 29 (Fall 2009):476-506, 496.

the female sex extends “[women’s] influence likewise over every custom and every action of social life.”¹³

As previously discussed, women have a dramatic impact on the development of any society - starting with the infant who has just taken his or her first breath to the highest levels of social politics. Women are nonnegotiable factors of social change and the well-being of a society.

Indigenous Women in Peru

There are over 6.5 million women who are of Indigenous descent.¹⁴ Six and one-half million people is almost the number of people in the city of Lima, the nation’s capital. This means that the number of Indigenous women could fill up almost the entire city of Lima. Women are a large demographic who require support and attention in the challenges they face.

Currently the indigenous population in Peru, like many Latin-American countries, experience cultural norms defined as:

Machismo - a set of cultural expectations for Latino men that has both positive and negative elements. Positive elements include the notion of honor, pride, courage, responsibility, and obligation to one’s family. On the other hand, it also implies sexual prowess, heavy alcohol consumption, aggressiveness, belief that men are superior to women, and resolution through dominance. Marianismo refers to the idealization of Latinas as submissive, self-sacrificing, and stoic.¹⁵

Bant and Girar explained, “The overwhelmingly male leadership of the ‘indigenous people’ movement fails to prioritize women-specific health concerns, particularly when formulated as women’s rights...”¹⁶ Bant also reported that “28 percent of women thought that women should not be beaten under any circumstance.”¹⁷ Seventy-two percent of women feel that it is acceptable for a man to beat them without reason at any time. That is not a developed or even developing society.¹⁸

A central concern for the population of any country is health status. Rosero stated, “The social problems of injustice, poverty, marginaliza-

¹³ McMahan, 496.

¹⁴ Central Intelligence Agency.

¹⁵ Heaton, Tim, Tina Huntsman, and Dallan Flake. “The Effects of Status on Women’s Autonomy in Bolivia, Peru, and Nicaragua.” *Population Research and Policy Review*, 24, no. 3 (June 2005): 283-300, 283.

¹⁶ Bant, Astrid, Girard Francoise. “Sexuality, Health, and Human Rights: Self-identified Priorities of Indigenous Women in Peru.” *Gender & Development*, 16, no.2 (July 2008): 246-256, 248.

¹⁷ *Ibid.*, 250.

¹⁸ *Ibid.*, 251.

tion and oppression that are found in the Andean region have compounded problems that are specific to women but which are not readily recognized. One aspect that is common... is that of gender discrimination.”¹⁹ Rosero explained, the domestic activities that women carry out: production and processing of food and clothing, gathering of firewood and water, looking after the children’s health and education, are done under very extreme conditions. This is partly because of the reduction of family incomes and partly because of the shortage of public services which would facilitate their work... This large allotment of “invisible” work, which does not count as productive work in society, takes place at home and it is women who are primarily responsible, owing to the sexual division of labor in the family.²⁰

Gender is a major determinant of health. Diaz-Granados et al. mentioned, “Gender inequities in health are a global public health concern in developing and developed countries.”²¹ “Poor, rural women in minority communities typically have more children, and begin bearing them at a younger age.”²² This fact alludes to the issue that these “poor, rural” women suffer from more health consequences including serious injuries and death.

In the book *Peruvian Street Lives: Culture, Power, And Economy Among Market Women Of Cuzco*, the author follows multiple women who work in the Peruvian street markets in the city of Cuzco. Linda Seligmann, the author, made record of what the women said affects their lives and what they have to deal with because they are women. Seligmann uses direct quotes from women to add meaning to their stories. One indigenous market woman, Dori, was quoted talking about her mother and said she “had her stall inside, six meters, a big one. My mother had to sell her fields because she was a woman, she didn’t have any brothers or a husband.”²³ This is just one example of how women are at a major disadvantage in the economic world based solely on their gender. Dori was also quoted saying, “There are many abandoned women here.”²⁴ She was speaking of husbands who leave their wives for work in other areas, other interests, or

¹⁹Rosero, Rocio. “Challenges of the Democratization of Popular Education from the Perspective of Gender.” *Convergence*, 26, no. 1 (1993): 73-82, 73.

²⁰Ibid., 74.

²¹ Diaz-Granados, N., and et al. “Monitoring Gender Equity in Health Using Gender-Sensitive Indicators: A Cross-National Study.” *Journal of Women’s Health*, 20, no.1 (2011): 145-153, 145.

²²Bant, 252.

²³ Seligmann, Linda J. *Peruvian Street Lives: Culture, Power, and Economy Among Market Women of Cuzco*. Urbana and Chicago: University of Illinois Press, 2004, 54.

²⁴ Ibid., 59.

other women.

Another dismal story Seligmann describes is that of Nanci Salazaar. Nanci is a thirty-four year-old woman who had a degree in nursing and extensive training. After graduating she searched for a job in the nursing sector but said, "... the positions were filled by people they brought from Lima."²⁵ Though Nanci was perfectly qualified, most companies would rather give the position to a man. Another woman, Eva Carhuarupay, was quoted saying, "My husband was very abusive."²⁶ Eva continued to say that her husband had a job and "sometimes" gave her money for household needs, "but" she said, "he mostly drank it away."²⁷ Bernice Alvarez said, "My first husband left with another woman."²⁸ Bernice also mentioned the rough way in which she and her siblings were raised by their father, she said, "He is always beating us, always punishing us for whatever little mistake, he has never given us any leeway."²⁹ The same mantra of problems continued through most of the women's stories: alcohol, physical and mental abuse, economic problems, and womanizing. Laszlo said, "Peruvian women nonetheless experience higher poverty and unemployment rates than men, and domestic violence and psychological and sexual abuse against Peruvian women is unfortunately a common reality."³⁰ The men of the region are said to have the attitude of "Don't get involved in my life, pay attention to your own."³¹

In the educational setting, teachers are "strict and authoritative."³² Alvarado mentioned that this style of teaching is especially degrading to female students because of the diminishing effects it has on their self-esteem. Alvarado reported that when interviewing female students between the ages of twelve and seventeen, "one in four had already dropped out of school."³³ According to Alvarado, "only 14% of rural 17-year-olds graduate from high school... female students represent the majority of the drop-outs."³⁴ Alvarado discussed how female students, after feeling oppressed

²⁵ Seligmann, 60.

²⁶ Ibid., 62.

²⁷ Ibid.

²⁸ Ibid., 63.

²⁹ Seligmann, 64.

³⁰ Laszlo, S., and Grimard, F. "Long Term Effects of Civil Conflict on Women's Health Outcomes in Peru." *World Direct*, 8, no. 4 (2010):1-37, 4.

³¹ Seligmann, 66.

³² Alvarado, Beatriz. "Voices and Agencialities in the Education of Young Rural Andean Women: A Qualitative Look. *Revista Electrónica de Investigación Educativa*, 12, no.2 (2010): 1-15.

³³ Ibid, 3.

³⁴ Ibid., 4.

and unappreciated, will hide their thoughts and voices from the school system and “will not only be lost to the young women, but they will be absent from the public arena.”³⁵

Education

The answer to the question how to help women and make the push for more equal legislation lies in education. Education has transformative powers.³⁶ McMahon continued to say, “[Education] promises well for the rising generation.”³⁷ “[Education] has been seen as a central component of national development and as a vehicle for social mobility.”³⁸ Rosero explained, “A majority of non-literate women live in rural areas.”³⁹ Rosero also mentioned that Peru’s “schooling up to the third grade for women between 20 and 24 years is 21.5%.”⁴⁰ This gives obvious signs of holes in the current system. Mitchell mentioned that women and girls often times do not have the opportunity to attend school simply because they are needed to perform necessary tasks in the home.⁴¹

But why do women need education? McMahon noted, “Historians have shown that education was a critical tool of self-fashioning and empowerment for women.”⁴² McMahon continued to explain that by education, women entered into the world of “teaching, writing, and activism.”⁴³ Teaching, writing, and activism are three definite areas where people learn from someone else who is sharing knowledge. If women are the ones teaching the classes, writing the manuals or handouts, and participating in social change, how long will the woman be oppressed? McMahon explained that women’s access to education allowed them to be “makers of public opinion.”⁴⁴ Original subscribers to the idea of enhanced women’s education in the USA knew that education was not an end. It was simply a start to a better society: “greater ends of social and political stability.”⁴⁵ McMahon stated, “Until both women and men gain access to proper education, virtue will be an empty name.”⁴⁶

Families who ensured education for sons *and* daughters were

³⁵ Alvarado, 8.

³⁶ McMahon, 478.

³⁷ McMahon, 484.

³⁸ Alvarado, 4.

³⁹ Rosero, 77.

⁴⁰ *Ibid.*, 79.

⁴¹ *Ibid.*, 227.

⁴² McMahon, 447.

⁴³ *Ibid.*, 477.

⁴⁴ *Ibid.*

⁴⁵ *Ibid.*, 478.

⁴⁶ McMahon, 481.

more able to achieve “more solid footing in the emerging middle class.”⁴⁷ Therefore, to educate women means not only to add strength and stability to society in general, but also to aid individual families in becoming more economically stable.

Health and Education

Women’s health has been at the forefront of and discussion for many agencies in the past. Women are recognized to be the most at risk for health disparities. Different aspects of benefits or outcomes designed specifically for women are stated in five of the eight “Millennium Development Goals” of the United Nations.

When discussing the effects of education on the betterment of women’s health, Kuhlmann stated, “...power structures can be changed through education, enlightenment and information.”⁴⁸ As previously discussed, one may conclude that higher education among women creates a more stable and healthy society. Shin stated, “Maternal education has been accepted as one of the most important influences on child health.”⁴⁹ Shin was suggesting that not only will more educated women enhance their own health, but they will also better the health of their children. More healthy children lead to an overall healthier society. Shin also said, “... higher level of education has a greater effect in rural areas.”⁵⁰

Problems often occur in Indigenous regions because of the customs and traditions that are so deeply engrained in the way of life. Shin suggested education as a vehicle for accepting change among the Indigenous population. This change is not to turn the Indigenous population into an urban, city-life type of people, but to embrace more advanced medical practices. Shin said, “About 73 percent of [Andean persons] are below poverty line, and 40 percent are in extreme poverty.”⁵¹ To combat the deficiency of economic resources for women, education may be a way out. Shin said, “...educated mothers have higher status and power, allowing them to take appropriate action when their children need health care.”⁵² Shin also made mention of the capability for education to replace or substitute for monetary resources in times of need. Shin claimed that about

⁴⁷McMahon, 487.

⁴⁸Kuhlmann, Ellen. “From Women’s Health to Gender Mainstreaming and Back Again: Linking Feminist Agendas and New Governance in Healthcare.” *Current Sociology*, 57, no. 2 (2009): 135-154, 145.

⁴⁹Shin, Heeju. “Child Health in Peru: Importance of Regional Variation And Community Effects On Children’s Height And Weight.” *Journal of Health and Social Behavior*, 48, no. 4 (December 2007): 418-433, 418.

⁵⁰Ibid.

⁵¹Shin, 420.

⁵² Ibid., 419.

five percent of women in rural communities have education levels past the secondary level.⁵³

In the article “Pragmatic Literacy and Empowerment: An Aymara Example” Mitchell discussed the outcomes of a small group of the Aymara population. The article analyzed an educational program that helps women learn how to pass a literacy exam that required a first- grade level literacy. This test was used to obtain an identification card that allowed safe and legal passage on a key route for supplies or other commodities and services for this group of Aymara. The author stated that the program is not only successful because this group achieved Spanish literacy, but it is successful “because [the women] are empowered in the process.”⁵⁴

Achieving better health status through education is a topic that many researchers have touched on. Laszlo and Grimard mentioned, “... education, which influence earnings, both of which influence adult health through health information or investment in health inputs.”⁵⁵ Laszlo and Grimard also said, “... more able, educated and wealthy mothers will be better fed during pregnancy and breastfeeding and so infant outcomes will be better.”⁵⁶ Utah Valley University (UVU) professors have performed studies called the Utah Women and Education Project and report, “On average, better-educated women live longer and are more likely to enjoy healthier lives than their less educated peers.”⁵⁷ This report by UVU states that education creates a “more extensive social-support network.”⁵⁸ Women have an innate sense of needing other women for social support. Women need friends in order to more fully express themselves and feel that they are heard. Education is an avenue for a more advanced and socially intertwined citizenry. This same study mentioned that child academic achievement is directly associated with mother academic achievement. It stated, “Research has shown that a mother’s expectations about the ‘eventual educational attainment of her children’ are related to the children’s actual attainment.”⁵⁹ Laszlo and Grimard also said, “Education provides

⁵³ Shin, 420.

⁵⁴Mitchell, Winifred L. “Pragmatic Literacy and Empowerment: An Aymara Example.” *Anthropology & Education Quarterly*, 25, no.3 (September 1994): 226-235, 226.

⁵⁵ Laszlo, 2.

⁵⁶Ibid., 3.

⁵⁷Madsen, Susan., Hanewicz, C., Thackeray, S. (2010). Research and policy brief. Utah State Office of Education Leadership Grant, Utah Valley University, Utah System of Higher Education, 1.

⁵⁸Ibid., 2.

⁵⁹Ibid.

the avenue out of poverty.”⁶⁰

There are endless benefits that may be associated with an enhanced education for the women. Especially when applied to the impoverished rural regions of the Andes in Peru. One may conclude that education not only has an effect on mental capacity and cognitive ability, but also affects social stability, economic status, as well as overall health in women and society in general.

Solutions

After all the research and discussion, a solution to the dilemma of greater equality and education in women is yet to be found. The real question of every research study is “how?” How should the ideas expressed in this article be taken from paper or verbal speech to actual implementation and change of society? There are many realistic ideas that have been expressed.

Garcia et al. asserted, “It is critical to view each woman as an individual, living in and affected by a specific physical and social environment: her community.”⁶¹ The views expressed in many of the articles previously cited, and others examined in preparation for this research, have explained that adaptation to cultural norms and habits is one of the best ways to accommodate for people of deep traditional backgrounds. When speaking of strategies that allow women to take more control of their own health, Garcia et al. stated “empowerment of women in their own health was the most commonly noted advance at the individual level.”⁶² Garcia et al. explained, “Addressing health and wellness solely at the level of the individual is insufficient...”⁶³ Garcia et al. also stated, “...much of what influences health and wellness lies within spheres beyond the individual, including interpersonal, community, institutional, and public policy arenas.”⁶⁴

Gabrysch et al. stated, “Cultural background influences beliefs, norms and values in relation to childbirth and health service use.”⁶⁵ Bill, Hock-Long, Mesure, Bryer, & Zambrano mentioned the need for “cultur-

⁶⁰Laszlo, 4.

⁶¹ Garcia, FAR., and et al. “Progress and Priorities in the Health of Women and Girls: A Decade of Advances and Challenges.” *Journal of Women’s Health*, 19, no.4 (April 2010): 671-680, 672.

⁶² Ibid., 678.

⁶³ Ibid.

⁶⁴ Ibid.

⁶⁵Gabrysch, Sabine., and et al. “Cultural Adaptation of Birthing Services in Rural Ayacucho, Peru.” *Bulletin of the World Health Organization*, 87, no. 9 (September 2009):724-729, 724.

ally appropriate health promotion and support intervention programs,⁶⁶ and discussed the initiation of “Healthy Start Programa Madrina.” Borthwick wrote an article about the incorporation of Quechua birthing traditions in new clinics built among high Quechua populations. Borthwick reported dramatic improvements in the rates of maternal mortality. Gabrysch et al. mentioned the success of these programs as continuing to rise every year since implementation. Microcredit, or the issuing of very small loans with low interest, was cited by Hamad, Fernald, & Karlan et al. as a solution to negative health problems. Hamad reports that parents, usually single women, who received these microcredit loans had an increased knowledge of many topics including health and health services.

Heaton et al. stated, “In recent years there has been an ideological revolution in theories of human rights. This ideological shift has been accompanied by efforts to improve the status of women worldwide.”⁶⁷ For women, to achieve high social status is a means of leaving the poverty bubble. Kuhlmann stated, “The notion of a universal and stable category ‘woman’ made it possible for women to take political action.”⁶⁸ This statement suggests that for women to be able to leave current oppressed conditions, it is helpful for them to achieve political and social recognition as important roles in society. Heaton et al. gave many great examples from the outcomes of increased social position of women. Heaton et al. stated, “Women’s education is highly correlated with sustained fertility decreases. Infant mortality rates among autonomous women are also lower. There is also evidence that autonomy influences domestic violence.”⁶⁹ Heaton continued to state, “Several studies show that women with high education levels are more likely to experience high levels of autonomy than are uneducated women. ... With education as a resource base, women are better able to gain independence from the constraints of patriarchal traditions.”⁷⁰

There exists great need for adaptation to the cultural and traditional customs of the Indigenous populations. Alvarado and Harvard University mentioned the need for academic curricula that adapts to the different regions where it is taught. We as people, no matter the location, have our own set of beliefs, customs, traditions, likes, dislikes, and even habits. As has been observed and explained, adaptation and understanding is what is

⁶⁶Bill, Debra E., and et al. “Healthy Start Programa Madrina: A Promotora Home Visiting Outreach and Education Program to Improve Perinatal Health Among Latina Pregnant Women.” *Health Educator*, 41, no. 2 (2009): 68-76, 68.

⁶⁷ Heaton, 283.

⁶⁸Kuhlmann, 144.

⁶⁹ Heaton, 284.

⁷⁰ Heaton, 287.

most needed in impoverished communities. Every human being needs a voice in this great world of varying dominants. It is our responsibility as a body of professionals to help those who cannot speak for themselves, with our voices collectively.

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Hamad, R., Fernald, L., Karlan, D. S. (2011). “Health Education for Microcredit Clients in Peru: A Randomized Controlled Trial.” *BMC Public Health*, 11, no. 1 (2011): 51.

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Section III

Utah High School Essay Winners



Running Out of Water

By Maranda Fisher

Maranda Fisher is currently receiving her secondary education through home schooling. Her prize for winning the 2013 contest was \$300.

“Everyone understands that water is essential to life. But many are only just now beginning to grasp how essential it is to everything *in* life – food, energy, transportation, nature, leisure, identity, culture, social norms, and virtually all the products used on a daily basis.”¹ Water plays an essential role in the everyday activities of human life. If not properly cared for, protected, and preserved through measures of conservation and care, our world will be without water, a desolate and deserted place because of the deterioration, and decimation of everything citizens take for granted. Water is a basic need and essential to everything in life. Water makes up two thirds of a human’s body weight and is a key element in surviving. A human being can go weeks without food but will not be able to make it very long, only the space of three to four days, without an adequate water supply. Water makes up 95 percent of a human’s brain as well as 82 percent of their blood.² It is safe to say that every living creature on this earth is made up of water which surrounds our every daily action. It takes massive amounts of water to create the food we eat each day and take for granted. It takes fifty-three gallons of water to produce one glass of milk and 634 gallons of water to produce an eight-ounce steak.³ Water is used for every step in the process, from bringing a baby cow into this world all the way until it the meat is cooked and put on the table for dinner. Without water, the world would not be able to stay hydrated nor would they be able to produce any food.

If this were to happen and all water was to be lost, the world’s population would experience a terrible decimation. Losing even the slightest amount of water in our body can affect all of our daily functions. A mere 2 percent drop in the bodies’ water supply can trigger dehydration which can cause fuzzy memory, migraines, and many other side effects that leave a person feeling crummy and sick.⁴ Two percent is a very small number which brings to the reality the importance of water on the lives of the over Six-billion humans living on our planet, not to mention the

¹“GMD 4 Water Quotes, Etc.” *GMD 4 Water Quotes, Etc.* Quote 1.

² “The importance of water and your health.” *Water Health*. n.p., n.d.

³ Rogers, Peter P., and Susan Leal. *Running out of Water: The Looming Crisis and Solutions to Conserve our Most Precious Resource*. New York: Palgrave Macmillan, 2010, 3.

⁴“The importance of water and your health.”

thousands of other life forms and plants that need water to survive. Water needs to meet our needs and sustain high living conditions and the earth's ecosystems.⁵

In 2001, the fastest growing city in the United States, Las Vegas, had run out of water.⁶ Since the 1920s the state of Nevada had relied on the Hoover Dam and Lake Mead to run the city.⁷ When the city was first founded it was not used for the common "sin city" that we know it by today. It started out as an agricultural hotspot with many farmers and ranchers. Later the strip was created, hotels were built, and the casino and gambling became a big part of Las Vegas. The problem came when water usage rapidly increased and there was no rush to conserve what little water they had left. This left instead a city that was quickly using up their rights to Lake Mead and the Colorado River, main sources of water.⁸

Starting in the 1980s Las Vegas' water consumption of 350 gallons per day was double that of New York City. To top it off, New York was receiving ten times the rainfall as Las Vegas.⁹ The Bellagio, a hotel on the strip, has a 27 million gallon tub of water that is used for their daily fountain shows.¹⁰ In the beginning, before Las Vegas started to conserve and use recycled water this was all coming places such as the Colorado River and was using up this restricted resource. Other hotels such as the Mandalay Casino and the Mirage have pools acres long holding millions of gallons of water.¹¹ It wasn't just the business's and casinos that were using this much water, the everyday public was doing the same. In 2001, the average Las Vegas household was using 17,000 gallons of water during the summer months which was more than any other western state.¹² Las Vegas came across a problem when the water supply ran out almost completely leaving not just the strip in a halt but also the many families living in Nevada.

The water shortage greatly affected farmers living outside of the big city of Las Vegas. Between 70 percent-80 percent of Nevada's water is used towards agriculture and generates over 6,000 jobs.¹³ Without agricul-

⁵ "Water Resources." *International Debates*, 9 no.1 (2011): 7. MasterFILE Premier, 1.

⁶Glennon, Robert Jerome. *Unquenchable: America's Water Crisis And What To Do About It*. Washington, D.C: Island, 1.

⁷ Ibid., 2.

⁸Ibid., 8.

⁹Ibid., 12.

¹⁰Ibid., 3.

¹¹Glennon, 2.

¹² Ibid., 13.

¹³ Ibid., 273

ture in the western United States, there would be a decline in the amount of goods produced. This would result in higher pricing, making food less accessible to the average American family. It became essential that water in the western United States was protected so that this would not occur any longer.

“When the well’s dry, we know the worth of water.”¹⁴ All around the country, especially in the western United States, water is becoming an even more limited resource. “Water is a valuable, exhaustible resource but as Las Vegas did until just a few years ago... we treat it as valueless and inexhaustible.”¹⁵ Many people do not worry or try to conserve water because they see it everywhere. It is all around them in numerous lakes, rivers, and oceans and is very easy to access at any given moment by simply turning on the faucet. Although the earth is made up of 70 percent water, only 3 percent of that is freshwater and a mere 1 percent is accessible to us.¹⁶ This is due to the fact that a good percentage of the water that is fresh is found in glaciers or other frozen, inaccessible areas.

Water is running out and if nothing is done about it these conditions will be a growing everyday occurrence. Starting in 2007, Lake Superior the earth’s largest freshwater body had been too shallow to float fully loaded cargo ships.¹⁷ This past summer Lake Powell was down by almost 50 percent. In 2006 there was a seven year drought in the Colorado Basin.¹⁸ Scientist predict that Lake Mead which supplies water to parts of Arizona and California could dry up by 2021.¹⁹ If this were to happen it would affect not only water supply but also electricity as the Hoover Dam is a source of electricity to the western United States. Every year all over the western United States there are droughts and dry areas. Just last year there were fires that became so bad they were raining ash. Had it not have been for the rain that was received, the entire state of Utah and other regions in the western United States could have gone up in flames. With the fluctuating weather conditions all over the western United States there are constant droughts. In the year 2012 there was such a small amount of snowfall that there was not enough water once it melted to run into the streams. Precipitation in July of last year was below average at a mere 81 percent. At the end of the water year in September the reservoirs were only

¹⁴ Glennon, 16.

¹⁵ Ibid., 17.

¹⁶ Rogers, 5.

¹⁷ Glennon, 98.

¹⁸ Ibid., 11.

¹⁹ Ibid., 8.

50 percent full.²⁰

Every day the entire world takes this clear, colorless, tasteless, liquid for granted. In 1995, the state of Utah used 267 gallons of water per person per day, the second highest in the country.²¹ The average overall in the United States today is about 100 gallons.²² This may not seem like that much water but when you think about it over the course of the year each individual person uses enough water to fill an Olympic sized swimming pool.²³ For the year 2012 the city of Taylorsville had on average 16,500 accounts in their database. During the winter and fall months between 2011 and 2012, an average of 140,000 gallons of water was billed for those 16,500 accounts. This was because the sprinklers had been turned off for the year and people were using less water outside of their homes. In the summer months of July and August this number was as high as 860,000 gallons.²⁴ Water is used constantly without even the realization that we are doing so frequently. With the looming crisis ahead of us and the scare in Las Vegas we may be on the verge of facing a worldwide epidemic.

“Even if water is considered a public good, there are significant costs for delivering water and operating water and wastewater systems to protect public health and the environment.”²⁵ Natural water rights explain why we have the right to water however we are required to pay the fees to get the water to us which makes it so accessible. Water is cheap at only four gallons per penny. It can cost a typical American family only \$20 per month for water.²⁶ Around the world, consumers pay more for water as the scarcity increases so with the lack of conservation we are only hurting ourselves and our pocketbooks.²⁷

“Real progress will require real involvement. It will require our encouragement, approval, money, and for some of us lifestyle changes.”²⁸ The Nevada state government was in desperate need to find new water routes and to conserve what little water they had left. Southern water authority Pat Mulroy worked to find an alternate water source.²⁹ Water authorities came up with the idea to create a pipeline to bring water to Ne-

²⁰ Trentelman, 1.

²¹ Glennon, 176.

²² Rogers, 3.

²³ Rogers.

²⁴ Fisher, Lance. “Re: Key Indicators 2012.” *Email to author*. 12 February 2013, 1.

²⁵ Rogers.

²⁶ Glennon, 223.

²⁷ Rogers.

²⁸ Ibid.

²⁹ Glennon, 8.

vada.³⁰ When this was opposed it was up to the city of Las Vegas and the state of Nevada to conserve all that they could. In 2002 Las Vegas faced serious conservation. They banned watering lawns, limited amount of water that could be used, and imposed water budgets on water using facilities such as golf courses.³¹ Other cities were having the same issues. Atlanta, Georgia came within three months of completely running out of water so they had to ban watering lawns, washing cars, and filling pools.³² In 2012, Tulsa, Oklahoma water levels were so low that water had to be rationed to the people. No outside watering was allowed and the water that was used could not exceed 210 million gallons for the entire city per two days.³³ “By reducing total commercial building water consumption by just ten percent meant saving more than two trillion gallons of water each year.”³⁴ Water doesn’t need to disappear altogether. There are many ways to limit it and conserve the water without too much a lifestyle change.

Conservation is a plan of action that must be carried out over a period of time to be accomplished. A research experiment was conducted to determine whether washing dishes by hand or in a dishwasher was more efficient and used less water. This was to see whether or not dishwashers really do help us conserve water. In many European countries including Germany, Italy, Sweden and the UK this experiment was conducted over the space of a few weeks. For two weeks, participants were to wash their dishes normally, be it by dishwasher, hand washing, or a combination and record what they did. A device would measure how much water and energy they used. In addition they had to take pictures of the dishwasher before they started it to test how full the average person was filling their dishwasher and to see if the fullness of a dishwasher affected the efficiency and the amount of water used. The results came through that households with a dishwasher used 50 percent less water and 28 percent less energy per cleaned item than a household without a dishwasher. The research showed that 20 percent of dishwasher baskets are only slightly filled meaning that 40 percent of the basket space was left free. Approximately one in every ten dishwashing cycles could be eliminated if dishwashers were always being completely filled.³⁵ In the wake of this experiment

³⁰Glennon, 10.

³¹Ibid., 12.

³²Ibid., 23.

³³“Editorial: Rationing? Heat, Drought Drive Water Drought Drive Water Usage.” *Tulsa World*, July 6, 2012. Newspaper source.

³⁴Watson, John. “High on Efficiency, Low on Water Usage.” *Buildings*, 102, no.4 (2008): 34. Vocational and Career Collection.

³⁵Richter, Christian Paul. “Usage of Dishwasher: Observation of Consumer Habits in the Domestic Environment.” *International Journal of Consumer Studies*,

the average dishwasher has been improved. Dishwashers need less water, are equipped better to hold more dishes, and are cleaning so well that it is becoming unnecessary to rinse off your dishes before loading. Improved motor pump technologies reduce energy and water by 30 percent. "From 1990-2005 water consumption for a standard dishwasher had been cut in half from 13 liters per load to less than 8 liters."³⁶ As daily household items are improved and water is conserved, the nation is able to pull themselves out of the series of droughts and despair that the lack of water can create for each and every one of us.

Across the United States, scientists and engineers are finding ways to conserve water without have to give it up. Shower aerators have been invented to create an illusion of abundant water pressure when really reducing water use. Each aerator saves 6,000 gallons per year. Another invention, on-demand water heaters provide hot water on the spot so that less water is wasted waiting for it to heat up.³⁷ In the toilet industry, inventors have come up with ways to limit the amount of flushed water. Dual flushometers were the result which allow the user to specify how much water is used to flush.

Ending with the water loss of Las Vegas, Stevie Wynn introduced water use and recycling. This led to low flow fixtures, drip irrigation, and recycling water. The Las Vegas strip now recycles 100 percent of their water unlike other places such as San Diego that dumps it into the ocean. Between the years of 2002-2006, water usage was cut by nearly 18 billion gallons of water a year.³⁸ Today Las Vegas is a very prosperous city with little to no worry about the loss of water as they now have a plan set up to conserve and recycle. If Las Vegas was able to pull itself out of a drought of nearly no water, then any country, state, or city is able to conserve their water, understand its value, and truly come to enjoy and understand the importance of water.

35, no. 2 (2011):180-186 Business Source Premier, 7.

³⁶Richter, 2.

³⁷Glennon, 14.

³⁸Glennon, 14.

The Case against Water Contamination in Utah: The Hazardous Factors That Led to Pollution and the Poor Policies that Tolerate it

By Quinn Everett

Quinn Everett is a student at Copper Hills High School.

“When the well is dry, we know the worth of water.” This statement by Benjamin Franklin is both poetic, and unquestionably true. Water is the number one resource that all humans take for granted. Even the founding father of this glorious nation could realize just how much this commodity is expected- without any cost. Whenever there is an abundance of something, it is in human nature to expect it, and when it is unattainable-we fight for it. Yet, this resource is at risk, and what is being done? When a country is defiled by domineering rulers it is never a question on what to do, but to fight for freedom. If the world’s greatest army marched upon the soil of this republic, the response would be a war filled with vigor and fought with every ounce of physical and mental energy: no second thought.

Today, a metaphorical army invades, one that has been growing stronger and building its resources since the beginning of man. This foe is unyielding and it seeks to take away our freedom and life force. This foe is also invisible to our eye. I speak not of fascist invasion, or even clandestine organizations, but of contamination to “life itself.”¹ Exupery defines water as “not necessary to life, but life itself,” and it is the protection of water, mainly in the second driest state of the United States (Utah), that this report is directed on. Groundwater and potable water in Utah is being unconsciously infected due to excessive corporate wastes, public contaminants, and most importantly government laws that allow and even encourage this pollution.

Groundwater contamination may not seem to be an extreme problem, but in the desert expanse of Utah more than 1.5 million residents rely on groundwater, and more than 50,000 have groundwater wells; that adds up to be more than half of Utahans that rely on groundwater to survive.² According to the Utah Geological Survey, groundwater is the primary source of drinking and irrigation in Utah.³ Some of the side effects to con-

¹De Saint-Exupery, Antoine. *Wind, Sand and Stars*. New York: Reynal and Hitchcock, 1939, 172.

²“Groundwater use for Utah.” National Groundwater Association. 2010.

³Sanderson, Ivan D., et al. “Groundwater Sensitivity and Vulnerability to Pesticides, Utah and Goshen Valleys, Utah County, Utah.” Utah Geological Survey

taminated drinking water are liver and kidney damage, Wilson's disease, and Gastrointestinal distress; and that is only for copper contamination.⁴ Other effects include skin damage, circulatory system problems and increased chance of cancer.⁵ Not only is this pollution real, but the Environmental Protection Agency is allowing this to go on. The EPA deals with rules concerning groundwater and surface water, yet this agency still allow over thirty known contaminants to be unregulated in their NSDWR policies.⁶ On top of the state allowing this impurity to continue is the drinking water contamination that the government allows the form of hexafluorosilicic acid. Evidence that this pollution creates a seven times greater risk for boys to contract osteosarcoma and fluoride calms hyperthyroid patients this could cause goiters and imparted glucose tolerance in the majority of non-hyperthyroid patients.⁷ Sclerosis and brittle bones are the most common side effects according to studies in 1994.⁸ If the moral wickedness of this contamination is not convincing enough, then think of the nutrient pollution that harms recreation and increases the cost of treating drinking water, yes, out of your tax money.⁹ EPA Scientist, and PhD, William Hirzy accurately portrays attitude that all humans should share: "public water supply should not be means of getting rid of hazardous waste."¹⁰ "Hazardous waste" is a term often generally interpreted and menially enforced; a term in dire need of adjustment.

What causes this infection of Utah's groundwater? The magnitude of pollution and risk-factors must be evaluated so an effective solution can be implemented. Utah is known for its vast rural areas and farming, this leads to the use of pesticides. The concern of pesticide use in Utah

and Utah Department of Agriculture and Food. 2002.

⁴ "Drinking Water Contaminates." United States Environmental Protection Agency. Updated June 5, 2012. water.epa.gov/drink/contaminants/index.cfm ---. "Basic information about Copper in Drinking Water. Updated May 21, 2012. EPA.

⁵ "Drinking Water Contaminates."

⁶ Ibid.

⁷ Connet, Paul, et al. *The Case Against Fluoride: How Hazardous Wastes Ended up in Our Drinking Water and the Bad Science and Powerful Politics that Keep it There*. White River Junction, Vermont: Chelsea Green Publishing Company, 193, 159.

⁸ Connet, 149, 170.

Chakraborti, Dipankar, et al. *Health Effects of Groundwater Fluoride Contamination*. *Clinical Toxicology*, 47, no. 2 (2009):292-295. MEDLINE, 292-95.

⁹ Trentleman, Charles F. "Nutrient Water Pollution at Issue in Utah." *Standard.net*. 16 Jan. 2012. Interview Contribution by Terrie Stephenson.

¹⁰ Connet, 17.

gained attention in 1906 by Richardson's studies and yet contamination still spreads.¹¹ Herbicides and fertilizers greatly affect groundwater.¹² Erosion and natural deposits from farm runoff contributes to arsenic levels in groundwater Chemical such as Alachor, Metalachor, Simazine and Atrazine; which are all found in Utah ground water and most of these are on the moderate to high scale of contamination.¹³ This is even more detrimental due to Utah's high hydraulic conductivity, high retardation, and these chemicals are applied in spring months; the same months of glacier water that offers recharge to groundwater.¹⁴

The second largest problem native to Utah is the massive amount of mining. Mining creates "a complex series of chemical weathering reactions... [which] exposes soil materials to an oxidizing environment,"¹⁵ in other words, it accelerates reaction rates at an alarming rate compared to typical weathering. The main concern is copper porphyry, which is mined on a massive scale and is detrimental to the groundwater and residents surrounding.¹⁶ In the area around Utah 87 percent of the mines are copper porphyry mines.¹⁷ The wastes generated from extraction, beneficiation, and processing exceeds 90-99 percent of all mined materials.¹⁸ The National Geological survey and information presented by Earthworks demonstrates the harmful effects of these mines in the current mid-west, which includes and affects Utah. Out of these fourteen mines 100 percent of them experienced pipeline spills and 9/14 of them had tailing spills, some affecting up to 2.6 million cubic yards¹⁹ Not only do these mines contaminate water drainage "from porphyry deposits commonly have concentrations of aluminum, cadmium, copper, iron, manganese, lead, and zinc that exceed US drinking-water limits, which were developed to protect public health..."²⁰ How can this poisoning keep going while the public is at risk? This is not just a rhetorical question; seven miles west of my neighborhood resides

¹¹ Sanderson, 2.

¹² Stewart, Robert. "Groundwater Contamination." *Environmental Science in the 21st century-An online Textbook*. Texas: Department of Geosciences, Texas A & M University. 2008. Online Textbook.

¹³ Sanderson, 1, 16.

¹⁴ Ibid., 18.

¹⁵ Stewart.

¹⁶ "US Copper Porphyry Mines Report: The track record of water quality impacts resulting from pipeline spills, tailing failures and water collection and treatment failures." Earthworks. 2012, 4.

¹⁷ Ibid.

¹⁸ Stewart.

¹⁹ "US Copper porphyry Mines Report:...", 4, 19.

²⁰ Ibid., 4.

the largest open pit copper mine: Kennecott Copper. This massive mine has a history of contamination and spills, Just two years ago there was a report of 145,424 gallons of copper tailings put into groundwater and in 2007 there was 35,000 gallons of hydro met tails with 1,240,00 gallons of process water (including arsenic) unleashed into the water system.²¹ More Statistics can be found in Earthworks, pages 10-11. In the last twenty years this run off has created a seventy-two square mile plume of contaminated groundwater.²² The damage was so extreme that the state of Utah filed a natural resource claim in 2008 for the detrimental impacts this mine has caused to the community, my home.²³ This process is predicted to go on for another decade.²⁴ What will this mean for my family and friends? Will we endure this poisoning for another decade, or will something be done?

Septic systems, landfills and other waste collectors add to the growing contamination of our groundwater. Dissolved solids, nitrate, anoxic constituents and organic compound leaks create an ideal sphere for organisms to thrive, which can increase disease and sickness.²⁵ Landfills and hazardous waste facilities that do not have liners to collect waste water are slowly killing our water supply. Even with liners, breaks are frequent and must be constantly monitored.²⁶ The agricultural area (most of Utah) where homes are not connected to municipal sewer systems, water is discharged into the ground and contaminates nearby streams and groundwater with nitrate and phosphates, further contributing to the pesticide contamination.²⁷ Not only is this contamination a cause, but the way they check for contamination is ineffective. They check for anoxic conditions, but this does not register the ammonia nitrification discharged, which is just as deadly to the environment.²⁸

On top of toxic wastes being allowed into our underground water, and ineffective safety policies, is the government allowance of our drinking water to be infiltrated by clinically proven toxins, especially one in particular: fluoride. Fluoride put into our water is not the prescription

²¹ "US Copper porphyry Mines Report:....," 10-11.

²²Ibid.

²³ Ibid., 4.

²⁴Borden, Richard K., et al. "Groundwater Response to the End of Forty Years of Copper Heap Leach Operations, Bingham Canyon, Utah." Lexington, KY: American Society of Mining and Reclamation (2006): 26-30. ICARD, 215.

²⁵ McQuillan, Dennis. "Groundwater Quality Impacts from on-site Septic Systems." Albuquerque: National Onsite Recycling Association. 2004, Abstract.

²⁶Stewart.

²⁷ Ibid.

²⁸McQuillan, 8.

material; it is actually a hexafluorosilicic substitute.²⁹ In phosphate and aluminum plants they produce hydrogen fluoride and silicon tetra fluoride gasses, which damages vegetation and cattle. So as a solution they captured them with water which converts these gasses into hexafluorosilicic acid.³⁰ This is issued in 90 percent of the public water supply.³¹ This substance isn't even allowed to be dumped in the ocean, yet it is acceptable to be in our drinking water. Not only that damaging, but there are also studies that prove the ill effects of fluoride. A study in Berhait, India proved that more than a third of the subjects of high fluoride suffered from fluorosis.³² During the 1940s Harold Hudge recorded side effects his workers obtained while working (on the Manhattan Project) with substantial amounts of fluoride, yet this book was not allowed to be published until fifty years later.³³ Wabott's 52 causes demonstrates that at 1 ppm (one part per million, in a liter of water) still causes side effects.³⁴ 1ppm is what fluoride is set at by the EPA, yet Lead and arsenic is set at zero, because they are shown to cause defects. The MLLG for Fluoride should be as well.³⁵

We are letting our water be destroyed and the government and business needs to do something about it. Not because we need be reliant upon them for everything, but it is affecting the majority of citizens in Utah, and according to John Locke- the main purpose of governments is to protect its constituents, from invasion, and from themselves.³⁶ Rural citizens in Utah rely heavily on groundwater and it is being dishonorably contaminated. We must not allow our most precious resource to be so easily polluted.

Some will argue that statistics show that groundwater contamination is decreasing, and the suggested fields are controlling their output of wastes and, to a degree, most are. Kennecott Copper mine has had a 97 percent reduction of wastewater flow since 1998 from waste rock to bed-rock contact and acidity levels have decreased since the same time.³⁷ This mine's efforts are commendable for keeping the environment safe. They have declined the volume of contaminated water, re-infiltrated, and diluted

²⁹Connet, 16.

³⁰ Ibid.

³¹ Ibid.

³²Chakraborti, et al., 292-95.

³³Connet, 148-49.

³⁴ Ibid., 127.

³⁵ Ibid., 202.

³⁶Locke, John. "Second Treatise of Government." Indianapolis: Hackett. Electronic Book. (EBook #7370) <http://www.gutenberg.org/files/7370/7370-h/7370-h.htm>.

³⁷Borden, 214.

the chemical runoff.³⁸ On the other hand, the decline of wastewater runoff decreases flow which increases the Copper concentration by four times.³⁹ What of the North end dumps? They may have less runoff, but are just as serious. Fluoride is still applied to all of our drinking water, despite what studies have proven to be harmful. Fertilizers and nitrate chemicals are still applied every year, and groundwater is still a daily threat.

No matter the current efforts against water pollution, there is still more that can be done. Our water has been contaminated for thousands of years, and it must be fixed on possibly even a larger time scale. We can, and must contribute to this change. As far as agriculture, organic growing would be the ideal solution; but understanding the current economy and price of organic foods this is not very feasible. They can regulate how much pesticides and herbicides they use, and have regulations according to stream and groundwater proximity. Mining operations can install collection flow systems.⁴⁰ Kennecott copper can focus on the north end of the dumps where there is less of a threat right now, but is not regulated like the east side.⁴¹ Septic systems and hazardous sites can invariably improve groundwater collection. The major difference septic controllers can make to help protect against pollution is the way they test for toxic conditions. Most regulatory systems regulate septic contamination in nitrate levels in oxic qualifiers because the higher the nitrate the higher the chloride and both are toxic.⁴² Chloride, sodium, and microbes are found in anoxic conditions as well, and this is not even tested for.⁴³ Making this a higher priority would consequentially cut contamination. These inadequate changes can and will help, but the greatest support must come from the government. The national Primary Drinking water Contaminations need to take Fluoride, copper, and other such harmful contaminants as serious as they do arsenic and lead. Just because lives are hurt in smaller numbers, they are still being injured. Fluoride may be impossible to totally remove from our public water supply, but the least the government could do is use Fluoride, instead of a hexafluorosilicic byproduct substitute. An acceptable example of this change is the Division of Water Control. They are studying how to get nutrients out of Utah's water, which could potentially cost millions of dollars to Utah Sewer Bills "but not all at once."⁴⁴ The battle to

³⁸ Borden, 214-16.

³⁹ *Ibid.*, 230.

⁴⁰ *Ibid.*, 223.

⁴¹ *Ibid.*, 230-31.

⁴² McQuillan, 5.

⁴³ *Ibid.*, 4.

⁴⁴ Trentleman.

rid our water of pollutants will not happen in a day, or a year, and defiantly not all at once” The approach must steady, and as long as it is gradually progressing, faster than pollution rates, then success is achieved. Cleanup must start, and the foremost way is one step at a time. The same rule can be applied to government policies; bill by bill will the water regulations be tightened, with the goal of saving fellow constituents?

Water Rights and Preservation

By Maison Evensen

Maison Evensen is currently attending Copper Hills High School.

Of the expansive Earth's total water capacity, only 2.5 percent is drinkable, usable fresh water.¹ With limited resources and expensive alternatives, fear of trouble and a need for equal water distribution is at the forefront of the minds of Utah, the United States, and the world. According to the United Nations, thirty-one countries are facing a depletion of water and increased water stress.² The next world war is intended to be fought not over oil, but over water resources.³ Because of growing water threats and limitations, the want to redefine water rights, especially pertaining to the Colorado River, have become important and resulted in an active desire for water preservation.

The water crisis occurring throughout the globe has made a number of people aware of water needs and limitations. George Hargreaves and Daniele Zaccaria, article writers, stated that global changes in climate show modifications in intensity and distribution of snow and rainfall.⁴ Also, many hydrologists say that the increasing temperatures have sped up the rate at which water evaporates and falls to the ground.⁵ These startling proofs of global warming show the need to conserve water for future generations by adapting to the shortages and searching for better ways of conserving water. In the next thirty years, Earth's population is estimated to grow by two billion, increasing the amount of people dependent on the Earth's constrained water supply.⁶ In 2008, the United Nations declared that more people were living in urban areas as compared to rural.⁷ Very often, water usage skyrockets as cities become more industrialized and increasingly make water more accessible. This is seen in the book by Alex Homme, a writer, who claimed that America's water use has risen from

¹ Manzoor, K.P. "The Global Water Crisis: Issues And Solutions." *IUP Journal of Infrastructure*, 9, no.2 (2011): 34-43. Business Source Premier, 35.

²Ibid., 1.

³ Ibid., 35.

⁴Hargreaves, George H., and Daniele Zaccaria. "Better Management Of Renewable Resources Can Avert a World Crisis." *Journal of Irrigation & Drainage Engineering*, 133, no. 3 (2007): 201-205. Academic Search Premier, 201.

⁵Homme, Alex. *The Ripple Effect: The Fate of Freshwater in the Twenty-First Century*. New York: Scribner, 126.

⁶Hargreaves, 201.

⁷Homme, 125.

150.7 billion gallons a day in 1950 to 410 billion gallons a day in 2005.⁸ This rapid increase of usage in such a short span of time shows the uncaring attitudes and/or a lack of education about the proliferating deficit of water around the globe. Institutions must be created to increase awareness of water shortage and the need to preserve the world's water supply. In particular, the United States has had disagreements with Mexico concerning water allocation and distribution. Beginning with annual and weekly water deliveries the United States Department of State then urged the states to avoid giving Mexico a share of water from the Colorado River.⁹ These drastic measures showcase the increasing unrestricted use of water and the desire to control and obtain what water remains at any cost.

Not all use of water, however, is without return. Many techniques have been created to increase productivity while reducing water usage such as: Recycled water that can be used for gardening.¹⁰ [H]ydropower that is used in many countries as a sustainable energy source, and worldwide agricultural irrigation techniques.¹¹ Although highly beneficial, water is still increasingly being used as resources decline [for example, 70 percent of the world's water is being used for agricultural purposes].¹² As the world moves closer and closer to a supposed World War III, the deficit and unequal distribution of water resources has pitted nation against nation and broadened the support for regulated water rights across the globe.

These water rights and water troubles can be seen developing in Utah. Laws, like the National Environmental Policy Act, are already in place by the United States government to impose limitations on river water management.¹³ As more and more water is used up by the citizens, the remaining water must be preserved for future use. A major part of the water used here in Utah is that of groundwater. Once a major carrier of water, the groundwater is facing a crisis; the reserves are becoming depleted. There is projected to be up to a thirty meter groundwater decline in Utah alone.¹⁴ [A]nd from Sevier Lake, Utah to Death Valley, California declines will

⁸ Homme, 125.

⁹Birdsong, Bret C. "Mapping the Human Right to Water On the Colorado River." *Willamette LawReview*, 48, no.1 (2011): 117-146, 126.

¹⁰Manzoor, 35.

¹¹ Hargreaves, 125.

¹² Manzoor, 3.

¹³ Birdsong, 123.

¹⁴ Deacon, James E., Austing E. Williams, Cindy Deacon Williams, Jack E. "Fueling Population Growth In Las Vegas: How Large-Scale Groundwater Withdrawal Could Burn Regional Biodiversity." *Bioscience*, 578 (2007):688-698, 690.

range from 0.3 to 488 meters throughout the 78 basins.¹⁵ With this alarming rate of decline, many preservation and distribution choices must be made to equally and effectively allocate water among the states as well as limit water use with an eye towards the future. Already in place, there are, “over twenty-six compacts that provide essential legal infrastructure for the growth of the West.”¹⁶ These compacts, which are the main regulators in the western United States, distribute virtually all of the water supplied by the major rivers.¹⁷ Not only does this help to regulate the distribution among the western states, but also creates a stable water infrastructure for the growth of the nation as a whole. When these fail, people aren’t able to access the water available to them, and they are only fair if the water distribution they implement includes equal dispersion. Many are advocating these compacts but revision must be made to ensure equal allocation.

One of the major concerns in the western United States is that of the Colorado River. The water allocation of this river alone is hotly debated.¹⁸ The Colorado River Compact divides the river into Upper and Lower basins.¹⁹ In order to use the river, infrastructures such as dams, reservoirs, canals, and pipelines are needed.²⁰ This increases disputes over land claims as well as needed funding to build these structures. In addition, for good or bad, the provision common states that states who give others the right to tap water from their region assigned can still enforce state laws and environmental standards.²¹ With almost total control of their designated area, states are able to self-regulate distribution and often times change policies to fit their state.

For decades Salt Lake City, Utah as well as the rest of the state have depended on the Colorado River as a reliable source of water and the Great Salt Lake Desert is given rights to 125,700 cubic meters of the river.²² This dependence on the river has heated the debate and increased the motive for Utah to fight for its water source; this isn’t always an easy fight though. In the early years of water installments, the biggest users were at the bottom of the river.²³ As the nation has progressed, the states on the

¹⁵ Deacon, 692.

¹⁶ Oliver, James M. “Utah’s Water Future in Court.” *Salt Lake Tribune*, September 1, 2012.

¹⁷ Ibid.

¹⁸ Oliver, 1.

¹⁹ Birdsong, 119.

²⁰ Ibid., 121.

²¹ Oliver, 1.

²² Ibid.

Deacon, 691.

²³ Birdsong, 120.

northern side of the river have grown. Cities such as Las Vegas, Nevada, which is among the fastest growing metropolitan areas in the nation have an increased dependence on the water.²⁴ Utah's downstream position on the river has made it harder to receive allocations when the northern states all take a share.²⁵ But Utah is not the only one that has fought for a share of water or expressed discontent over current water distribution. Other states, like Wyoming, have demonstrated opposition to the allocation from the river.²⁶

Not only are interstate feuds interfering with states' abilities to regulate water distribution but natural causes are as well. Bret C. Birdsong in his writings stated, "the Colorado River can't provide enough water to satisfy all the demands under the local regime."²⁷ As the nation is ever expanding, more and more people are becoming ever dependent on the river and its flowing water source. As the demand and need for water increases in that area, the Colorado River flows "will continue to decline as droughts become more frequent."²⁸ Over-groundwater extraction, natural global warming, and sparse evaporation have further decreased the amount of water available in the river, increasing tension and the need to find a reliable source of water.

Many wildlife threats have come about from the overuse of the water from the Colorado River. It is estimated that there are five species of mammals, birds, fishes, and other wildlife that are threatened and a total of fifteen species that are endangered.²⁹ What rights do the animals have to the river and its resources? As the human population expands exponentially, many forget that there are other species sharing their reserves of nature's water. As a result of the wildlife threats presented, laws such as the Endangered Species Act have imposed limitations of water use along rivers in the United States.³⁰ One can only hope that through acts such as these, and other wildlife saving agencies, that the support to save other species will result in further water regulation and adequate use of water.

As the population and water usage increases, there are many troubles that come about, effectively restricting some use of water and making it ever important for find a way to preserve the water available today. Water contamination is a big issue within the United States as well as

²⁴ Deacon, 688.

²⁵ Oliver, 1.

²⁶ Ibid.

²⁷ Birdsong, 117.

²⁸ Ibid.

²⁹ Deacon, 689.

³⁰ Birdsong, 123.

throughout the world. On April 20, 2010 The BP oil rig had a blowout in the Gulf of Mexico, dumping 2.5 million gallons of oil per day into the gulf.³¹ This extreme case represents the mistakes that can result in years of contamination and recovery. In Utah, groundwater pollution has contaminated sources of drinking water for the public. In addition to unusable water, millions upon millions of dollars are used in the restoration of the water to what it once was. Through this, companies around the globe have instituted regulations to make sure this never happens again.

In the case of water contamination in a groundwater site in America, it can only be fixed through expensive excavation and refilling.³² This can be very discouraging, especially to a nation currently experiencing a recession. Most often, these sites will be loosely cleaned and capped but toxins are still often able to leak into the source, contaminating the water once again.³³ As a result, the United States has created laws to regulate water usage and urging the disuse of pollutants such as soap in the drain-water system. Also, new methods are being created to reduce the cost of money needed to clean water supplies. Through progression, one can only hope for further improvements and reuse of water.

Another major concern in the United States is the overuse of water and the corporations that have access to more water than they should. In western America, there is a law that allows farmers to access water from rivers for free as long as it is used “beneficially.”³⁴ This corruption and easy access for water had decreased the natural resources available and has allowed much more water to be used than necessary. Groundwater is often withdrawn so much that it exceeds the annual renewal rate.³⁵ This withdrawal results in an invasion of salt water into the aquifers, and destroys them.³⁶ More strict regulations are needed to regulate the use of groundwater as a resource for water and the unrestricted agricultural use of water.

Alex Homme wrote in his book, “As the demand for goods and services go up, so does the competition for water supplies.”³⁷ [H]e could not have been more right. The expanding cities have overpowered many farmers in the American west who have had to sell their land and water rights to these cities.³⁸ Corporate corruption is prevalent in their access

³¹Homme, 31.

³²Ibid., 29.

³³Ibid.

³⁴ Ibid., 239.

³⁵Hargreaves, 203.

³⁶Manzoor, 36.

³⁷Homme, 239.

³⁸Ibid., 126.

to tube-wells and water sources in the West.³⁹ With power over the water resources accessible in the United States centered in the power of the cities and the corporations, regulations by the government have been and need to be made to ensure equal rights for all; enough to flush waste, keep water in the sinks, and have sanitary environments.

The water preservation and definition of rights is a major priority in Utah, as well as the rest of the world. Natural influences such as global warming and dispersed precipitation have made it harder to collect water supplies from those sources. As the population increases, water use increases and the demand for water is fought about. In the dispute over the Colorado River, Utah is fighting hard against the northern states that are expanding beyond belief. Water rights are bitterly fought over and the future of water allocation is unknown. Water preservation is becoming increasingly important as pollutants are contaminating once-clean water reserves. Lack of wildlife awareness has decreased the number of wildlife along major rivers. Overuse of water by corporations and agricultural enterprises has decreased the availability of water. Stringent compacts must be imposed to protect the water supply and define state rights while retaining an equal distribution policy. People must become aware of the dwindling water supply and prepare for the possibility of a depletion of water and a fight to save all that is left.

³⁹Manzoor, 2.

Wind Energy for Mountainous Regions

By Justin Ngo

Justin Ngo was attending Copper Hills High when he wrote this essay.

Wind energy is very sustainable and a clean source of renewable energy. Mountain communities that desire to be on the energy grid must employ wind power because wind turbines are easier to install than other sources of renewable energy and wind speed is increased due to higher altitude, which increases power output.¹ Utilizing a new invention called the wind-lens, introduced at the European Wind Energy Association in the fall of 2011; increases wind turbine power output by 400 percent.² The wind-lens also addresses the drawbacks of conventional wind turbines, which are noise, visual impact on natural scenery, and hazard to birds.

The power that can be produced in mountain communities is much greater because of their high altitude.³ To illustrate wind power as a viable solution, a town in mountainous China, Dali, has wind turbines at an altitude of 3,000 meters. The wind farm at Dali produces the same amount of energy as burning 20,000 tons of coal reducing 50,000 tons of carbon dioxide every year.⁴ Yearly emissions eliminated by generating energy from a 1 MW (megawatt) wind turbine instead of 1 MW of conventional sources: over 1,500 tons of carbon dioxide, 6.5 tons of sulfur dioxide, 3.2 tons of nitrogen oxides, and 60 pounds of mercury in one year.⁵ Another community that uses wind power as a source of energy is Oregon. One project in Oregon, directed by Columbia Energy, is building forty wind turbines in Steens Mountain to produce energy for 30,000 homes.⁶ Wind turbines are a vital source for rural farms as they produce energy and require very minimal space. Wind turbines are also safe enough that livestock can feed at the foot of the wind turbines. Building of wind turbines in Dali, Oregon, and rural farms demonstrates that wind energy is a viable solution to mountain communities energy needs.

¹*National Geographic*. "Harness the Power of Wind."

²Ohya, Yuji, et al. Development of Shrouded Wind Turbines with Wind-Lens Technology. Brussels: European Wind Energy Association.

³*National Geographic*.

⁴Cartillier, Jerome. "China Harnesses Mountain Wind Power." (November 22, 2009).

⁵Pennsylvania Wind Working Group. *Factsheets and Statistics*.

⁶Cockle, Richard. "Oregon's Steens Mountain Could Soon Have Wind Farms." Oregonian (February 7, 2010).

With the invention of the wind-lens, conventional wind turbine power output can increase 400 percent.⁷ Wind-lens is a shroud and brim that covers the wind turbines blades. The brim of the wind-lens causes a low pressure region behind the blades of the turbine, which in turn causes high pressure wind to be channeled through the shroud. The high pressure wind causes a power increase because power is proportional to wind speed cubed.⁸ This invention maximizes a wind turbines power output, which means that less wind turbines are required to produce the same amount of power. Less wind turbines keeps the natural landscape from being interfered with at a minimum. The wind-lens also reduces the need for tall towers and long blades. Lower towers and shorter blades reduce the visual impact of wind turbines in mountain communities.⁹ Wind energy alone can produce the United States annual energy need with the aid of the wind-lens. Currently the United States consumes around 26.6 billion megawatts hours a year. With the United States having 850,000 square miles of high potential energy yields from the wind. Using 20 percent of the 850,000 square miles, approximately one-fourth the size of Alaska, for six 1.5 megawatt wind turbines for every kilometer land squared will produced 8.7 billion megawatts hours. 8.7 billion megawatts hours are enough to satisfy one-third of the United States annual energy consumption.¹⁰ With the use of the wind-lens technology, which could increase wind turbine power output by 400 percent wind energy alone could satisfy United States annual energy consumption.¹¹

Opponents of wind energy in mountainous regions claim that wind turbines are very noisy and will cause disturbance to people and wild life living near wind farms. Wind farms are required to be built 300 meters away from nearby houses.¹² This reduces the sound heard from wind turbines. At 300 meters away, wind turbine only produces 35-45 decibels. Wind turbine noise level is a lot less than a car 100 meters away traveling at 40 mph. The night time background noise of a rural setting is the same as wind turbine noise level. This means that wind turbine noise can be drowned out by a nearby stream or breeze in trees or hedgerows which

⁷Ohya, Yuji, et al.

⁸Ohya, Yuji, and Takashi Karasudani. "A Shrouded Wind Turbine Generating High Output Power with Wind-lens Technology." *Energies* (2010): 634-649, 635.

⁹Ibid., 648.

¹⁰Limer, Eric. "Japanese Innovation Could Make Wind Power Cheaper than Nuclear." (August 31, 2011).

¹¹ Ohya, and Karasudani.

¹²"Noise from Wind Turbines." British Wind Energy Association. (June 15, 2000).

is likely in mountainous regions.¹³ The wind-lens also reduces the noise level of wind turbines even further. Wind turbine noise is generated from the blade tip of the wind turbine. This is because the blade tip is moving quickly causing disturbance in the air, which creates noise. The shroud of the wind-lens suppresses the disturbance caused by the blade tips, significantly reducing the noise the blade tip produces.¹⁴

Another reason opponents argue against the use of wind energy is the visual impact wind turbines have on surrounding landscape. Opponents claim that to utilize wind turbines effectively, wind turbine towers are required to be very tall.¹⁵ This influences the natural landscape by bringing in man-made objects into the scene. The visual impact of wind turbine is reduced in mountainous communities because of their high altitude, which means increased wind speed.¹⁶ Increased wind speed reduces tower height, minimizing visual impact. With the wind-lens technology, tower height can be lowered even further. The wind-lens increases the wind speed that acts on the blade of the turbine increasing power output significantly. The wind-lens does not need to be exposed to high altitude wind to obtain the equivalent power as conventional wind turbine, which allows wind turbine tower height to be lower drastically. Not only can the tower height be lowered, the length of the blades can be shortened and still produce the same amount of power as conventional turbines.¹⁷ The wind-lens can also make wind turbine more aesthetically pleasing than a conventional wind turbine.

Environmentalists claim that wind turbines kill birds and bats, but the amount that wind turbines harm is far less than other factors. “Wind farms currently kill far fewer birds than the estimated 100 million that fly into glass buildings, or up to 500 million killed yearly by cats. Power lines kill an estimated 10 million, and nearly 11 million are hit by automobiles, according to studies.¹⁸ Compared to other factors, buildings kill 60,000 percent more birds and cats kill 300,000 percent more birds than wind turbines. Government regulation also reduces the amount of birds killed by wind turbines. Government has restricted wind turbines from being built in the flight path of migratory birds.¹⁹ Wind-lens also address the safety concerns of bird. The wind-lens surrounds the blades of the wind turbine;

¹³ “Noise from Wind Turbines.”

¹⁴ Ohya, and Karasudani.

¹⁵ Pennsylvania.

¹⁶ *National Geographic*.

¹⁷ Ohya, and Karasudani.

¹⁸ Fears, Darryl. “Wind Farms under Fire for Killing Birds.” *Washington Post* (August 28, 2011).

¹⁹ Pennsylvania.

this makes the wind turbine more visible allowing birds to see the wind turbine to avoid it rather than running into the blades of the turbine. The wind-lens also gives added protection because the wind-lens surrounds the blades of the turbine. The encased blades ensure that objects are not thrown off from the wind turbine as it is spinning, increasing safety.²⁰

Wind turbines are a very viable source of energy for all mountain communities. Wind turbines do not take much land area and are safe. The effects of wind turbines are very minimal and effects are further reduced by government regulations and the new invention, wind- lens. The wind-lens can increase power output by 400 percent, reduce noise level generated from wind turbines, lower the height of turbine tower to reduce visual impact on natural scenery, and reduces the death of birds. So wind energy is an excellent way to get mountain communities onto the energy grid. Also by using the wind-lens technology, the number of turbines need to power a mountain community are reduced. The reduced number of wind turbines lessens the impact that wind turbines have on the natural landscape and also gives mountain communities the energy that they require to function in modern world. Less environmental impact with the same energy output will not only please environmentalist but also mountain communities that need the energy.

Wind energy is a sustainable source of energy and the environmental impacts are very minimal. With the addition of the wind-lens, environmental impacts are significantly diminished and wind energy alone can power the United States annual energy needs. Utilizing high wind areas, which includes mountainous regions, wind turbine power output is increased drastically. Concluding that wind energy is the choice that mountainous communities should use.

²⁰Ohya, Yuji, et al. 648.

Sustainable Energy Sources and Benefits of Thorium in Modern Society

By Jacob Adler

Jacob Alder was a sophomore at Olymplus High when he wrote this essay. He will graduate in 2014.

I was seven years old when my family moved from a small house near central Salt Lake City to a suburb in Millcreek. The new house was considerably larger, prettier, and more open than our previous home. It was situated on approximately an acre of land; ideal for rambunctious boys (my friends and me), determined gardeners (my mother), amateur princesses (my sisters), and unruly miniature dachshunds. It seemed ideal; however my parents were fairly alarmed at the dramatic spike in the cost of heating, air conditioning, water and electricity bills. The larger house required much more energy than the previous home, and had, in retrospect, a much bigger toll on the environment. With two air conditioners, three furnaces, and two water heaters (more than doubling the previous house), the jump in energy consumption should have been no surprise.

For many decades Americans have been distancing themselves from compact city life and placing more emphasis on suburban life. This change has significantly complicated our relationship with the environment. Such a change has had an impact on farming, arable land, pollution, oil consumption, wild land, soil consistency, atmospheric pressure, and the average temperature of the globe, to say the least. However, the majority of this change is irrevocable; for example, it would be illogical, indeed impossible, to now destroy suburbs in order to reinstate wild life.¹ Yet, there are possible solutions which will greatly decrease the negative human effect on the world. Nothing we are currently using on a broad scale, like coal or oil, is that solution; those fuels may not last. Solutions to supporting an increasing global population lie in sustainable energy. Sustainable energy sources must be the focus of a people who want to survive. One of the most exciting solutions is Thorium.

In this paper, I will explore current perceptions about energy, safety, and sustainability. I will present facts about alternate energy sources, Thorium, and draw comparisons between Thorium and Uranium. Currently, nuclear reactors use Uranium, however the system is entirely inefficient—only about 0.5-0.7 percent of the product is used as energy, the rest

¹Owen, David (2004, October 18) Our Local Correspondents, “Green Manhattan,” The New Yorker, (p.111).

is disposed.² Thorium, like Uranium, is a naturally radioactive element. But unlike Uranium, Thorium is considerably more abundant in the earth and can be used more efficiently and effectively.³ It is safer; if a Molten Salt Thorium Reactor lost power like the Fukushima-Daiichi or Daini reactors did, then the liquid Thorium would simply drain into a holding tank and solidify, rather than “explode” because of a lack of coolant. Thorium has the potential to be a better and, on the whole, a cleaner energy source because it has so few byproducts.⁴ Is it possible to instigate Thorium as the energy of the future? The answer is that it is not only possible, but necessary to develop Thorium as an energy source if we are serious about feeding the world’s appetite for power.

Perceptions About Current Energy Technology

The general populace understands wind and solar power, and can picture a dam when hydroelectricity is produced. Perhaps vague ideas exist about geothermal, bio, and ocean energy. Coal, oil, petroleum, and natural gas are well known and relatively well understood fossil fuels. Support for different energies varies greatly, however. A poll in 2011, conducted by the Nuclear Energy Institute, shows that 62 percent of respondents supported nuclear energy. The public’s view of nuclear energy facilities and production safety has “transformed over the past decades.” Seventy-three percent of polled Americans believe that, “Nuclear power plants operating in the United States are safe and secure,” compared to only 35 percent in the 1990s.⁵ It is fantastic to have this increased support in nuclear energy production; however, it is still a bumpy road. “Public support [of nuclear energy] was at [the] lowest” after tragic incidents like Chernobyl; support tends to undulate in accordance to global issues.⁶ The public sees nuclear energy as safer than it was twenty years ago, but tends to believe more strongly in older forms like coal and oil. The challenge though, is that there is not an adequate supply of fossil fuels.⁷ A poll of the European Union in 2007 showed a definite split in the opinions about coal; nearly two thirds of the populations of Eastern and Central Europe were strongly in favor of coal production, whereas the majority of Western Europe (France, Belgium, Spain, etc.) was opposed. In Britain only nine

²Sorenson, Kirk. YouTube videos. website www.energyfromthorium.com:

³ Patzek, Ted. “Thermodynamics of the Corn-Ethanol Biofuel Cycle.” *Plant Sciences*, 3, no.11 (July 22, 2006).

⁴Sorenson.

⁵Nuclear Energy Institute. New Plants. <http://www.nei.org/resourcesand-stats/documentlibrary/newplants/factsheet/policiessupportnewplantdevelopment/?page=3>.

⁶ Ibid.

⁷ Sorenson.

percent were opposed to production.⁸ Although coal and nuclear energy are very different in their effects on the environment, they receive similar favoring, but reliance on and general support of fossil fuels is higher.

Support for renewable energy sources depends greatly on cost. A poll by the World Public Opinion at the recent World Future Energy Summit in Abu Dhabi showed that there was strong support for tax incentives to develop alternative energy sources, “Specifically [to address] dependence on foreign energy.” On domestic soil, “91 percent of [leaders] believed investing in renewable energy is important for the US to...compete with other countries in the global economy.”⁹ Yet, citizens of the U.K., Italy, France, Germany and the US “disagree with paying more taxes to cut greenhouse gas emissions.”¹⁰ The International Energy Agency showed that generating electricity from current renewable energy technologies is “twice to eight times as expensive as coal-based electricity.”¹¹

It seems to be a stalemate of sorts; it would be ideal to choose the cleaner, more cost-effective energy source, though currently that does not exist. Cleaner energy exists in renewable forms, but those are more expensive in production. The fossil fuel non-renewable energy sources are cheaper to produce and easier to sell; there is a larger market for them; e.g. most cars are not outfitted for biodiesel or ethanol fuels, whereas nearly all cars use fossil fuels of some sort.¹² At this critical time where the consumption of energy is at record highs, we can choose to continue using fossil fuels and relatively inefficient renewable energies or pursue other sources. Nuclear energy, despite recent damning events, still stands as a source capable of generating huge amounts of power. The future of nuclear energy is not in Uranium. The future of nuclear energy is in Thorium; this nuclear energy seems to truly be energy for the future. There was a stone age, a bronze age, and iron age. There was a dark age, an age of discovery, an age of enlightenment, an industrial age, and a machine age. In the twentieth century, there was an oil, atomic, space, and information age. The next “age” of human existence is already developing under frame-

⁸World Coal Association. *Public Attitudes to Coal, Clean Coal Technologies and Energy Costs, Ecoal*, 76 (November 2011). <http://www.worldcoal.org/resources/ecoal/ecoal-current-issue/public-attitudes-to-coal-cts-and-energy-costs/>.

⁹Brick, Steve (2010), Proceedings from Chicago Council on Global Affairs, ‘10: Harnessing Power of Biomass Residuals (2010).

¹⁰Harvey, Fiona. “Recession Results in Steep Fall in Emissions.” *Financial Times*, September 21, 2009.

<http://www.ft.com/intl/cms/s/0/a0f0331c-a611-11de-8c92-00144feabdc0.html#axzz1pFVGKsgg>.

¹¹ Ibid.

¹²Patzek.

work of sustainability.¹³ In order to supply energy to future generations, nuclear must be considered.

Benefits of Thorium

When work on the atomic bomb began in the 1940s, scientists realized that there were many nuclear elements from which to choose. Of the long list of very radioactive elements, like Iridium, Xenon, Plutonium, Thorium, Protactinium, and even Radon, the element Uranium was chosen to be the fuel source. Uranium is a rare earth metal, similar in abundance to Gold, Platinum, Silver, and Tin.¹⁴ However, Uranium production has high-volatility waste which can be used in weapons. Perhaps this is one of the reasons why scientists in the Manhattan Project—the 1942 convention of American scientists focused on beating the Germans to develop the atomic bomb—chose Uranium over the safer Thorium. The scientists wanted to use an element which could be used in weaponry.

The world's Uranium can be found in few locations like Canada and Namibia.¹⁵ Uranium is also found in seawater; it is 1000 times more abundant in the ocean than it is on land. However, current methods of harvesting Uranium are very expensive: more than \$100/lb., and as previously mentioned only 0.5 percent of the energy is used.¹⁶ Still, Uranium is the only element which current nuclear reactors can handle. Nuclear energy would be better if it could yield more power more safely than Uranium does. That safer, better element is Thorium.

Let's talk about the basics of Thorium before we analyze its' amazing benefits. Thorium, named after the Norse God Thor, was discovered in 1828. Thorium-232, the most naturally occurring isotope of Thorium, has a half-life¹⁷ of approximately 14.05 billion years. Such a long half-life signifies low radioactivity levels; when Thorium particles are used up and disposed of, the threat to the environment (and to life) will be considerably less than Uranium-238 (the naturally occurring form of Uranium) because a half-life of Uranium-238 is 4.47 billion years.¹⁸ Thorium, as previously stated, is more abundant than Uranium, approximately four times more

¹³“Green Energy-Which Countries Have the Most Potential?” *Business Insights*, (2009):57-59.

¹⁴ Sorenson.

¹⁵Ibid.

¹⁶Tamada, Masao. “Current Status of Technology for Collection of Uranium.” Seawater, Environment and Industrial Materials Research, Division Quantum Beam Science Directorate; Japan Atomic Energy Agency, (2009).

¹⁷Note: A half-life, as far as atomic elements go, is a measure of how long it takes half of the element to decay. The shorter the half-life, the more radioactive the element is.

¹⁸ Sorenson.

so.¹⁹ The Argonne National Laboratory said:

Thorium is widely distributed in small amounts in the earth's crust. The chief commercial source is monazite sands, where the highest levels of Th-232 are present, in the United States (in North Carolina, South Carolina, Idaho, Colorado, Montana, and Florida) as well as in Brazil, India, Australia, and South Africa. Thorium is naturally present in soil, rocks, surface water, groundwater, plants, and animals, at low concentrations on the order of ten parts per million.²⁰

Theoretically, Thorium is present in practically everything. Even humans generally have approximately 0.002 percent Thorium in their bloodstreams. Thorium in the body is usually dispersed by 700 days or so.²¹ Thorium is more abundant than Uranium, which is available approximately 2 parts per million.²² Even if Uranium were more readily accessible, Thorium is more easily obtainable. As Thorium can be found in almost any rock in the world, it is certainly easier to access than absorbing it in small, expensive doses from the ocean.

Production of Thorium

Production of nuclear energy, through Uranium, is done in what is called a Light Water Reactor. The "LWR" used in Japan—or, it was the technology they used up until the catastrophe of 2011. Because Uranium is such an intensely radioactive element it creates high pressure and heat; those turn the water into an incredibly dense steam which then turns the turbine to generate power. However, this immense pressure is what caused the explosions at Fukushima Daiichi and Daini. The water supply which cooled the Uranium supply was cut off and the unimaginable heat exploded. This is why nuclear energy gets a bad reputation; Uranium is so volatile. Nevertheless, no two nuclear elements are the same. Thorium is quite the opposite of Uranium. Rather than extremely volatile, it is a more "mellow" element and if power to the system is cut off, the frozen salt plug (which held the Thorium) melts, and the liquid Thorium simply drains to a holding tank where it can be used later on.²³ It does all of this without human intervention. Despite its increased safety, Thorium nuclear energy creates more energy than U-233 does. In fact, "Thorium is so

¹⁹ Sorenson.

²⁰ Argonne National Laboratory EVS. Natural Decay Series, "Thorium," Human Health Fact Sheet, August 2005.

²¹ Ibid.

²² Ibid.

²³ Sorenson.

energy dense that a lifetime supply of it can be held in the palm of your hand.”²⁴ The Molten Salt Reactor or Liquid-Fluoride Thorium Reactor “LFTR” uses Thorium approximately two hundred times more efficiently than Uranium nuclear plants do.²⁵ The nature of the LFTR uses Thorium in a liquid state (whereas a LWR uses Uranium in solid form) and yields mere fractions of waste compared to the LWR. The LFTR utilizes nearly all the waste of Thorium, and makes it cleaner than Uranium by factors of hundreds and cleaner than Fossil Fuels by factors of millions.²⁶

Conclusion

As the global population grows greater every day, so does the demand for energy. People are always going to need energy. For there to be future generations, the energy we seek must be clean and sustainable. Otherwise, we will create great deficits and eventually exhaust natural resources. That does not even include the tremendous waste and hazards of using non-sustainable sources: the pollution alone can kill thousands of people, and the damaging effects can ruin crops and contaminate water, killing even more people. Renewable energies, like wind and solar, although beneficial and important, cannot supply the world the power it needs. Nuclear energy has the capability to solve energy demands, and in Thorium there is real hope. Thorium is abundant, sustainable, and a cleaner energy source than Uranium. There is more power in Thorium than fossil fuels and renewable energies. To energize our world, indeed, to save it, we must consider the “Thorium Age.”

²⁴ Sorenson.

²⁵ Barton, Charles. “What are the problems with LFTR Technology?” Nuclear Green Revolution. (August 29, 2011). <http://nucleargreen.blogspot.com/2011/08/what-are-problems-with-lftr-technology.html>

²⁶ Sorenson.

Micro-Hydro Power

By Amber Kelpacz

Amber Kelpacz attended Copper Hills High School when she wrote this essay.

Millions of years ago, this planet was beautiful to behold. If one stood on the foremost point of a mountain, one would observe that the earth was rich with life and unadulterated air blowing around the blooming, green plants. Fast forward to the present, and all that would be seen is the abhorrent smog that fills the horizon. The air is sometimes so polluted that people are warned to keep their children inside, lest they inhale the toxic fumes. This perversion of the once unclouded atmosphere is the result of years of human beings using non-renewable energy sources to power almost every aspect of their lives. This unhealthy way of life can be changed, but in order to do so the world must unite in its effort to cleanse its power sources and reinvent its way of life. Many alternatives to the non-renewable fossil fuels used today have already been implemented, including solar power, wind power, hydro power, and geothermal power. When first introduced none of these energy sources were utilized on a large enough scale to constitute a monumental difference. This is due to the fact that employing devices to harness renewable energy was costly, environmentally harmful, and often considered too much of a hassle to be bothered with. However, as technology has advanced, application of renewable energy sources has increased.

The term 'renewable' means that the energy will not run out- it can be reused as many times as needed. This makes water, wind, and sun good sources of renewable energy because they are not in danger of running out, unlike the fossil fuels so commonly used today. An excellent place to find an ubiquitous supply of these renewable energy sources is in the mountains. However, mountain dwellers do not reap the benefits of living in these bountiful environments. This is because mountain neighborhoods lie outside of the main power grids, which are most often designed to supply energy to lowland communities. Those who live in the mountains are often left out of the power supply even though they live in the middle of an area full of potential energy. Mountain inhabitants are forced to use forms of energy that scar the environment, and are in need of an alternate energy source that will be able to reach them in their communities. Solar power is not always affordable and wind turbines have drawbacks as well, such as availability of space, higher costs, and harmful environmental effects. Hydro power requires reservoirs or lakes and even if there is a reservoir nearby it would not be able to reach the mountain populace because they

are not connected to the power grid. However, there is a form of hydro power that would be able to reach isolated mountain communities called micro-hydro power. Micro-hydro power is an excellent source of clean, reliable energy that is a perfect fit for secluded, mountain areas. Because this green energy source is efficient, affordable, and has almost no effect on the environment, it should be implemented in mountainous regions to provide power to scattered and isolated mountain communities.

Micro-hydro power is different from regular hydro power because it operates on a smaller scale. Hydro power is harnessed by instituting reservoirs and building dams. As the water from the reservoir flows through the dam it creates electricity.¹ The power generated from this process is used to provide power to homes and communities, whether they are connected to the power grid or not. Micro-hydro power uses the same concept as hydro power does but on a smaller scope; micro-hydro systems are usually considered any system that generates up to 100 kilowatts of power, while regular hydro power systems can generate up to over 10,000 megawatts of power.² While hydro power uses large dams and reservoirs, micro-hydro power is harnessed by temporarily diverting the flow from smaller rivers or streams and sending it over a waterwheel or turbine. As the water forces the wheel to turn, electricity is created and the water then flows back to the original stream or river.

There are four different types of water turbines used to harness micro-hydro energy: impulse style, small impulse style, reaction style, and a submersible propeller. Impulse style and small impulse styles work like a toy pinwheel; as water falls on the turbine it pushes the blades around in a circle and generates electricity. Small impulse water turbines are ideal for sites with a minimal amount of water flow on a steep hill and impulse turbines are best for sites where the water source has a high head (the vertical distance between where the water enters the turbine system and where it reaches the turbine runner) of twenty feet or more.³ Reaction style turbines require a larger amount of water flow than impulse turbines but can operate with as little as two feet of head. This makes them ideal for flat or low land sites with a large water flow. Reaction style turbines route the water through a pipeline into some type of encased housing. As

¹ “Micro Hydro Power.” Fire Mountain Solar. Fire Mountain Solar LLC Powerful Renewable energy Solutions, 2012.

² Ibid.

“Hydroelectricity.” Wikipedia. Wikimedia Foundation, 15 Mar. 2012. Web. 16 Mar. 2012. <http://en.wikipedia.org/wiki/Hydroelectricity>.

³ “Micro Hydroelectric Power.” Alternative & Renewable Energy. ABS Alaskan, 09 Jan. 2008. <http://www.absak.com/library/micro-hydro-power-systems>.

the water exits the house and drops through the blades, it turns the turbine. Submersible propellers are the most simple and least efficient of the four different designs. When this turbine is submerged in water, the force of water rushing past the turbine turns the blades to generate electricity. Submersible propellers work best for locations with fast moving, deep water. It was originally designed for marine use, but could easily be implemented in a deep enough river or stream. These different turbines come in a range of output voltages, and can be matched with the overall voltage of your electrical system. For mid-sized systems, 12 volts is the common voltage; large systems can output 24-48 volts of electricity.⁴

Micro-hydro energy is able to supply power to small areas instead of large cities, like large-scale hydro power is designed to do. “Micro-hydro power is especially effective at supplying the energy needs of isolated, scattered upland communities.”⁵ This is because one of the best suppliers of water is the runoff created from snow-melt in the mountains. Spring months are the best time for harvesting micro-hydro energy because this is when the highest amount of water flow from runoff occurs. The summer months will have the smallest amount of water flow, which is one disadvantage to micro-hydro power.⁶ But as long as adequate planning is done before establishing the micro-hydro power systems, one will be able to count on a year-round supply of energy. For mountain dwellers, the energy harvested from micro-hydro power can be integrated into their own homes in a cost-efficient manner because the energy is coming from a nearby location.⁷ Even if the scattered homes in the mountains are not connected to the power grid, they would still be able to receive a supply of micro-hydro energy.

Micro-hydro power systems can be set up for any price from \$1,000-\$20,000 depending on the size.⁸ This price is relatively small when compared to other renewable energy sources, and the excess energy harnessed can often be sold back to the local utilities.⁹ Other cost benefits for installing micro-hydro power include: “...income tax credits, property tax exemptions, state sales tax exemption, loan programs, and special grant

⁴ “Micro Hydroelectric Power.”

⁵ “Sustainable Building Best Practices for the Rocky Mountain West.” Sustainablebuilding. University of Colorado Real Estate Center. <http://leeds.colorado.edu/asset/publication/sustainablebuilding.pdf>.

⁶ “Alternative Energy.” Micro Hydro Power a. “Pros and Cons. Alternative Energy. Oct, 26, 2006. <http://www.alternative-energy-news.info/micro-hydro-power-pros-and-cons/>.

⁷ “Micro Hydroelectric Power.”

⁸ “Alternative Energy.”

⁹ “Micro Hydro Power.”

programs.”¹⁰ One of the problems seen in the past with large-scale hydro power in the mountains is that the construction and upkeep of the reservoirs and dams has destroyed and scarred the landscape. It has deprived people of agricultural land space as well as increased flooding and landslide risk. Many mountain inhabitants have been forced to relocate because of the effects of regular hydro power systems.¹¹ Unlike regular hydro power, micro-hydro power would not run into these types of problems because it is environmentally friendly. Of all the forms of renewable energy, micro-hydro power has one of the smallest impacts on the environment. It does not significantly change the flow of water in the river and the water can still be used for other purposes after going through the micro-hydro system. In fact, some argue that micro-hydro power actually has a positive impact on the environment because it increases farming efficiency and reduces the need to use other sources for fuel.¹²

Hydro power supplies 19 percent of the world’s total electricity supply, or about one billion people.¹³ Only 5 percent of the world’s micro-hydro power potential has been taken advantage of.¹⁴ This is due to the fact that micro-hydro power is often unheard of or unknown about. There are disadvantages to micro-hydro energy, such as the fact that certain site characteristics are required for micro-hydro power to be harnessed, and once it has been established there is no room for expansion. Another downfall to micro-hydro energy is that as stream size fluctuates during different seasons, so does the output of power. Specifically, summer months will have less water flow and therefore less power being harnessed.¹⁵ If one was wishing to power an entire city with one micro-hydro turbine, it would not be smart or cost-efficient. However, when proper caution and care are taken in planning a micro-hydro site, the energy harnessed can be beneficial and cost-efficient for areas with small amounts of people, like mountain communities. This further supports the cause that micro-hydro energy is a good solution for mountainous regions because the communities established there are smaller and therefore cover a more limited amount of space than lowland towns and neighborhoods do.

¹⁰ “Micro Hydro Power.”

¹¹ Ibid.

¹² Ibid.

¹³ “Energy.” Mountain Partnership Working Together for Mountain People and Environments. Mountain Partnership, 2008. <http://www.mountainpartnership.org/issues/energy>.

¹⁴ “Hydroelectric power.” The Hutchinson Unabridged Encyclopedia with Atlas and Weather guide. Abington: Helicon, 2010. Credo Reference.

¹⁵ “Alternative Energy.”

Micro-hydro power plants are not as big as large-scale power plants and are not meant to provide power to entire large cities. However, micro-hydro power is an effective and beneficial way to power smaller communities not connected to the main power grid- specifically, mountain communities. Mountainous regions are replete with renewable energy sources just waiting to be harnessed. Micro-hydro power is a meritorious solution for powering small, isolated mountain communities that have otherwise had to rely on harmful fossil fuels to power their homes because they were not reached by the main power grid.

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Women's Education in Mountainous Regions

By Shelby Jorgensen

Shelby Jorgensen is currently attending Brigham Young University and will graduate December 2014 with a bachelor's of science in Sociology. She is interested in studying human inequality, specifically dealing with education. After graduation, Jorgensen wants to pursue a degree in either law or educational policy, with the desire to increase women's educational attainment around the world.

Nearly a billion people will enter the 21st century unable to read a book or sign their names. Two thirds of them are women.¹ Education, or lack of, is a rising problem in the 21st century, especially for women in mountainous regions of the world. Many women cannot get an education due to their cultural circumstances, increasing poverty, unsafe environments, and the rural terrain.

In many cultures, an education is not seen as beneficial for women because their primary role is to be a mother. “[They] believe that there is little point in paying for a girl’s education, as they are destined only for a life as a mother, and not a career where they could make money.”² In the Islamic religion at age four, girls start to assume household tasks and take care of their siblings. By age ten, most could replace their own mothers.³ While they are learning the trade of a homemaker, their brothers go off to school. At age fourteen, most girls are married and starting their own homes.⁴ An education has now passed them by, and with forty-nine percent of adults in third-world countries illiterate, many will never know what they are missing.⁵

As an education is not seen as beneficial, it is not wanted either. Greg Mortenson, an American trying to build schools in rural Afghanistan and Pakistan, ran into this mind-set frequently. When he asked city and tribal leaders if he could build schools in their areas, they thought he was a “bad spirit” trying to invade their land. They would issue *fatwas*, an Islamic “restraining order”, against him and tell him never to come back. Women in their culture were not seen as needing an education and had not received one for hundreds of years, so why would they need a school? Culture is such a ruling guide in mountainous regions that new ideas are

¹“Universal Primary Education.” *Millennium Development Goals Report*, (January 03, 2007): 010-11.

²Faisal, Safa. “Muslim Girls Struggle for Education.” *BBC News* (September 24, 2003).

³Brazier, Chris. “State of the World Report.” *New Internationalist*.

⁴Colclough, Christopher. “Girls Miss Out On Going To School.” *BBC News* (November 06, 2003).

⁵“Facts about Illiteracy.” *SIL International*, (September, 07, 2001).

often never excepted.⁶

In some cultures women learn traditional skills, instead of a regular education. Due to the different environments, many receive an education that fits their culture and lifestyle. For example, in the rural back country of central Africa women are taught how to make natural medicines and herd animals. A large part of their studies is spent learning indigenous dances and folktales. They are not taught by certified teachers, but by tribal leaders or the elderly. Most will never learn Calculus or take a computer class. Although they do not receive an education like ours, they are learning the ways of their culture. They may not be our “book” smart, but they have the “street” smarts to survive.⁷

Poverty in their nation, town, and family is a common reason why girls do not get an education in mountainous regions. These area’s governments do not have the funds to provide a wholesome education. “Since the mid-eighties, factors like falling prices on the world market, marketing difficulties, high debts, but also growing military expenditures...have forced many countries to drastically reduce state expenditure in the...educational system. On an average, ‘Third World’ countries spent less than US \$1 in the beginning of the nineties per pupil and per year on learning material (in industrialized countries: U.S.\$100-200).”⁸

The parents of girls cannot even come close to paying for the deficit left by the national government. In Africa, 20 percent of men and 25 percent of women are unemployed.⁹ Money is spent on survival instead of education. If there is money, it is often spent on educating sons instead of daughters. David Bloom claims, “Girls are seen as relatively transitory assets — not worthy of long- term investment — as they leave their parents’ household upon marriage...which means that boys’ schooling is inevitably seen as a better investment.” These countries do not always follow the rule “ladies first”. An example of poverty’s effect on education is found in *The Diary of Ma Yan: the Struggles and Hopes of a Chinese Schoolgirl*. In this book, Ma Yan’s mother tells her that she cannot continue going to school. Her father is out of work and they cannot pay the tuition for her and her brothers. They can barely afford to put food on the table. Yan stops going to school, but her brothers continue. They need to be able to

⁶Mortenson, Greg, and David Oliver. *Three Cups of Tea: One Man’s Mission to Promote Peace -- One School at a Time*. New York: Penguin, 2007.

⁷Marah, John K. “The Virtues and Challenges in Traditional.” *Journal of Pan African Studies*, 1, no. 4 (2006): 015-20.

⁸Nestvogal, Renate. “School Education in ‘Third World’ Countries.” University of Essen.

⁹“World and Regional Unemployment Rates.” World Bank.

support their future families, but she does not. Ma Yan later returned to school, but only because her mother obtained a third job. By this time, she was behind in her studies and was in a lower class than other girls her age. Without sufficient funds, education for all women will never become a reality.¹⁰

Due to lack of safety because of wars, verbal comments, and physical abuse many girls in mountainous regions are deterred from getting an education. Wars have a major effect because “civil wars are likely to destroy a state’s system of education through the loss of infrastructure and personnel.”¹¹ The already few schoolhouses are destroyed. Teachers go off to war, leaving students to gain their own knowledge. The money that used to be spent on education is channeled into paying for the war.¹² With already barely any money set aside for education, there is nothing left. Chris Brazier claims that “less than one percent of what the world spent every year on weapons was needed to put every child into school by the year 2000 and yet it didn’t happen”.

Greg Mortenson, author and star of the book *Three Cups of Tea*, is one of many people trying to provide an education to girls in war-torn countries. Instead of spending much needed money on school houses and supplies, he ends up providing food and shelter to refugees of war. He stated, “If we truly want a legacy of peace for our children, we need to understand (wars) will ultimately be won with books, not with bombs”, about the conflicts in Pakistan and Afghanistan.¹³ When people are consumed by their lack of physical necessities, education is not pursued. Not only do wars tear apart the present, they massacre the future.

Because it is not customary for women to receive an education, many are verbally abused through mocking and teasing. Boys in their classes will throw rocks at them on their way to school. Some will tell them to get back to their homes where they belong. Teachers often ridicule girls, telling them they are trying to become equal with men. Because of verbal abuse, many parents choose not to send their daughters to school.¹⁴ Physical abuse is also a major deterrent on education. Just recently, in November of 2009, it was discovered that 12, 260 girls were physically abused by teachers in the country of Kenya. Due to the fear of being

¹⁰Yan, Ma. *The Diary of Ma Yan: The Struggles and Hopes of a Chinese School-girl*. New York: HarperCollins Publishers, 2004.

¹¹Thyne, Clayton. “The Effect of Civil War on Education, 1980—97.” *Journal of Peace Research*, 44, no.3 (2007).

¹²Ibid.

¹³Mortenson.

¹⁴Bloom, David. “Essay: Girls’ Education in Developing Countries: Mind the Gap.” PBS. September 04, 2004.

punished for speaking up about the abuse, many girls and their families did not report it and if the abuse was reported, many teachers were never prosecuted. Even with the extensive attention these abusive situations are receiving today, there are not the court systems in place to do justice to the problem.¹⁵ Lack of safety is a major concern for women in third world countries and many will never have the opportunity to get an education because of it.

If mountainous regions are culturally accepting of education, have sufficient funds, and are not abusive, they still have one major roadblock standing in the way of women receiving an education—the location the women live in. Mountainous regions are dominated by rural and often treacherous landscapes. Many cities cannot be entered without climbing steep, brutal mountain passes by car, animal, or foot. The weather is often versatile and you can only travel there during the space of a few months. When schools are built, they can often be obliterated by snow, rain, wind, or sandstorms. It is hard to find needed supplies, which if shipped in can take months. The effort of bringing supplies up to these rural areas is almost impossible, not to mention tedious, back-breaking work.

For example, in trying to build his first school in north-eastern Pakistan in the city of Korphe, American Greg Mortenson was faced first-hand with both the brutal terrain and weather. He first had to buy supplies in Skardu, a town one hundred miles away from Korphe. He then slowly carted the building materials by truck eighty-eight miles, but the trucks were stopped by mud slides brought on by the soon-approaching winter months. Mortenson was stopped just short of his destination. But the people of Korphe wanted a school bad enough that all able-bodied men were sent down to carry the supplies. With the beams upon their backs, they carried these and all the other building material up eighteen miles of steep slopes to their village. The winter weather took control before the school could be completed and was not finished until the following spring.¹⁶ If schools are to be built in mountainous terrains, better methods will be needed to supply and build schools so that they will be able to withstand the harsh climates.

Nelson Mandela proclaimed: “Education is the most powerful weapon we can use to change the world.” We cannot change the world until all women are educated. There are many roadblocks in the way: cultural differences, lack of funds and safety, and harsh environments. These obstacles can be overcome and by educating all women, many

¹⁵ Siring, Samuel. “Shocking Details of Sex Abuse in Kenyan Schools.” *Daily Nation* (November 01, 2009).

¹⁶Mortenson.

women's lives in the present and future will be blessed.

Women of the Mountains: Past and Present: What Can We Learn From These Brave Souls?

By Katie Pontsler

Kathryn "Katie" Pontsler was born in San Diego, California however she has spent almost her entire life in Salt Lake City, Utah. She is currently pursuing a Bio-Veterinary Science degree at Utah State University and plans to specialize in marine mammal care. Pontsler has always had a passion for helping those who have been downtrodden including women's rights and animal treatment issues. Writing her essay about the Women of the Mountains, and reading the inspirational writings of others, has further increased her interest in helping these populations.

A woman of the mountains is a hardy breed of person who has learned to survive and even thrive in harsh of conditions, yet is also loving and resourceful in these adversities. Living in mountains areas can be hazardous for anyone, but especially for women. This is often exacerbated many fold if their husband or family has left or died, forcing them to live on their own. Although there are differences between modern women of the mountains and more historical figures, the trials endured and solutions to these challenges are surprisingly similar. Examining how women of the mountainous area in the eastern part of the United States were able to live, both the past and present, despite the differences of the times, may give us insight in to how we too can be resilient in difficult circumstances.

Historically, an unmarried or solitary woman was not only considered a burden to her family, but also as a disgrace because they were considered weak and unable to take care of themselves. The book *Cold Mountain*, by Charles Frazier, is a historical novel based on the true stories of people in the mountains of North Carolina. The main character, Ida May is left by the man she loved to go fight in the United States Civil War for the South. Her father had died and she was forced to take care of the land by herself. She failed miserably and lost all of her crops because she was neither skilled nor knowledgeable about farming. The land and house were on the verge of being a total loss due to debt. She faced abject poverty because inflation ran rampant and her father's bank investments soon became worthless. Being a woman of the mountains, she fought back and learned to survive.

Gaining friends and a support group was often key to survival. During the harsh first winter, she had friends who occasionally gave her food because she had none. Eventually she befriended a young lady named Ruby who helped her take care of the farm. These two strong women banded together and they were able to get through the winter, although it meant selling many of their possessions, including Ida May's Beloved

piano. Throughout their journey together, they had to learn had to make traps to keep people and animals out of their food supplies, how to kill and cook animals, how to handle a gun, how to farm, plow, build fences, mend roofs, and many other everyday struggles of that time which would normally be done by men. Other women in the area could not handle this kind of abandonment and, in struggling to survive, turned to prostitution. The challenges were hardly over even with the acquisition of these new skills. Often soldiers or other people would invade their homes looking for food or even more evil intent.¹ For women of the mountains, life is not just about learning to survive, but also dealing with children, sickness, and finances while taking on all of the other responsibilities of life.

Today women in many countries face similar problems that mountain women in the 19th century faced in the United States, whether or not they live in the mountains. Our eyes only need to look south of the border to Mexico and much of Latin America where many of the men have left their families to seek fortune in the US or other areas to support their homes. The women are left to care for the home and family, often with little to no support from their husbands. Sometimes women and even children turn to prostitution for a source of money, drugs, and food. Surprisingly, many of these young adults are proud of themselves for being able to support themselves without begging or wandering from house to house looking for someone to help them.² Occasionally, women will take employment at bars or nightclubs, but find themselves sexually exploited by men. When asked how women got into prostitution, many women in urban Uganda replied that they enter the profession “through marital separation and the need to support children via rural-urban migration to obtain wage work in Kampala.”³ The money these women got from prostitution and other jobs helped to pay to feed their families, pay for school fees, and their rent. However, for every woman who chose this path, there are dozens to found alternate ways to make a living through their own resourcefulness and fortitude, earning themselves the same designation of ‘women of the mountains’, whether or not they actually lived a mountainous area. Many women learn to band together for their common good, forming their own unique communities and support systems. Many times this leads to multigenerational households comprised of adult women and

¹Frazier, Charles. *Cold Mountain*. Atlantic Monthly Press, 1997.

²Zalwango, F., L. Eriksson, J. Seeley, S. Nakamanya, J. Vandepitte, and H. Grosskurth. “Demystifying Sex Work and Sex Workers.” *Archives of Internal Medicine*, (2010).

³ Ibid.

children. They learn to survive and take care of themselves in difficult circumstances. Living on the edge does have other consequences such as dealing with sickness and maintaining health.

Women of the mountains are usually not affluent, but learn to make a living on the edge of poverty. One consequence to poverty is access to adequate health care. No matter where you live in the United States, there are antibiotics and physicians to help, however all of this comes at a price and many people cannot afford the cost of medicine. Earlier in this century, women of the mountains learned to care for the sick. In many areas of the world, access to affordable and reliable health care is not available.⁴ They too must learn to care for the sick on their own. In Africa, the stigma of HIV has lead husbands to leave their wives and families believing that the disease is a curse brought by the woman. He fears the disease, even though it was often him who gave her the virus, and refuses to acknowledge his own culpability. Often women of the communities band together to scratch out an existence through mutual support and cooperation rather than dependency. They may have an illness, but they love their children and want a better life however, HIV is incurable and death is always the end result. As a consequence, women of the mountains must learn to deal with death as a way of life.

In *The Mountains of our Mind*, by Bob Mckerbow, the author relates how people who live in the mountains of Afghanistan, where there is a war going on, are struggling and dealing with their dead family. The war is costing them so much more than just money, but their livelihoods and even lives. Many people can barely go from place to place without fear of death. One poem in the book describes how a family is dealing with the death of their little boy. The mother is cleaning out a grave with her tears and water while the father is selling items to help pay for their one month year old daughter. It goes on to talk about other people who knew him and how their lives used to be without bullets and guns all around them.

Another poem was written about the women of the area that describes the people trying to do their best on their own and through all the war going on. They try to sell gum and books or try to sew, clean, wash, and even nurse baby to get money to survive. It goes on to describe that to pay for their father's debt some children are placed into prostitution.⁵ However, even then they are often left with nothing. Soon enough women may find a baby on her left hip and a teenage boy in her right hand while running from the machine guns trying to get away from war and death.

⁴Hawthorne, P. "Hope For the Living Dead." *Time Magazine* (February 11, 2002).

⁵Mckerbow, Bob. *Mountains of our Minds*. India Research Press, 2003.

Such was seen during the civil war in our own country where many women were left to tend the home and farm while the men were out with the army. Today, women of the mountains must learn to deal with adversity, even war, while surviving and protecting their families.

Some people might say that women of the mountains don't have it any harder than anyone else. Wherever there is poverty, there will be hardship and problems. However, the women in these areas have special problems because they often lack the support system of family that exists for city dwellers. They also lived in more extreme climates, in more isolated conditions, and with fewer resources than could be found in the cities. The options are fewer, therefore they learned to make do, mend, or go without. This is what distinguishes women of the mountains from others.

A woman of the mountains is an example of the strength of women everywhere. The resilience of these proud individuals in the face of poverty, illness, war, and other adverse circumstances can give us hope in the face of tragedy. In the place of despair, they show hope and in the place of defeat, they find a way to survive. Many women around the world live in difficult conditions, similar to the mountain women of the United States. Although things may be better in the United States for women who live in Mountainous regions than in the past, there are still challenges to overcome, and things have not changed for many women around the world. Perhaps it is our responsibility to go help women of the world to learn to live in dignity and hope, whether or not they have a man at their side. Opportunity, education, and resources are all that is needed to help these brave women succeed. We can take the triumph of human spirit shown by these women and apply it to our own circumstances and maybe, just maybe, we can make the world a little better for those who come after us. We can all be a woman of the mountains in our own special way.

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The Benefits Mountainous Communities Can Achieve Through Women and Education

By Ivan Delgadillo

Ivan Delgadillo attended Utah County Academy of Science when he wrote this essay in 2011.

It is no secret that today's society faces many new problems due to changes in the world's political tendencies, economy, and social structure. These problems manifest themselves in many aspects of our society and in turn affect us as individuals. Recently, the economic downturn and the "centralization" of the world's political dialogue have caused people's attention to shift to the issues that affect their nation as a whole. While national issues deserve people's scrutiny and thought, it is my belief that our culture's belief in individualism has its roots in the fact that real political change and problem-solving begins at the individual level.

That concept is the reason that people in our country should be more informed about and involved in the issues that shape their particular communities specifically; issues that have a more pronounced, urgent and direct effect on their lives should be looked at with a sense of awareness and responsibility. This feeling of commitment to an important cause must be used to create a global network of leaders who care for their community and wish to advance its interests.

This is the reason that the International Mountain Partnership has been created. People of the mountains realize the issue of sustainable development deserves their direct attention due to the consequences their communities could possibly face if the issue is ignored. This issue has prompted grassroots action that has spawned a global network of leaders and concerned people from all walks of life that have made much progress and have raised awareness to the importance of active participation in the crucial issue that is sustainable mountain development. This movement is now part of the agenda of the United Nations and is beginning to gain real attention in communities worldwide. The new attention that it is receiving has created new debates and ideas that deserve our consideration and involvement. Among the various discussions that relate to sustainable development, there is one issue that is considered by many to be the defining subject in the campaign for increasing awareness about sustainable development and creating significant change. That issue is women and their role in contributing to their mountainous communities around the world.

Due to many of our institutions and important dialogues' status as creations of the overwhelmingly male mind, it is important that moun-

tainous communities become inclusive and cross the threshold that many other issues and those associated with them have failed to cross. Women must be recognized and lauded for their contributions to mountainous regions of the world. The best way to improve women's opportunities and raise awareness to their potential in our communities is education. Women and their education determine what the workforce looks like, the level of community morale and productivity their community has and most importantly increases community involvement in regions that need reform. The creation and maintenance of a global community of mountainous societies could be greatly helped by a greater amount of women being involved in the process. An inclusive process must be created for women to have equal opportunity and outlook in their mountainous communities. In order for this to happen, global education for girls must be improved. There are two main issues that must be resolved to further women's educations in mountainous regions of the world. These obstacles are funding and accessibility in relation with social equality in school from an early age. If these issues are addressed appropriately, women's standing in the world will be greatly increased and mountainous communities will reap the benefits of a more educated demographic in their efforts to engage the issue of sustainable development.

In most mountainous regions of the world, funding for education is low. This disturbing fact is made more significant when one considers another disturbing fact: one in three women or girls in the developing world live on less than two dollars a day and "more than 60 percent of the 110 million children out of school are girls."¹

In order for this to be changed, local governments must be made aware of the situation. Students at Utah Valley University have been showing leadership on that front. Recently, due to the efforts of Utah Valley University and its students, Salt Lake City made an official commitment to join the mountain partnership. Under the umbrella of this alliance, women's issues in our community are being given vast consideration and recognition on an international level. Today's new economy and flat global workplace is opening opportunities for a large and diverse group of people. But women in mountainous regions worldwide are still at a disadvantage to take these opportunities for a variety of reasons. All must be done to affect change in our communities on this issue. When literacy is thus used to corroborate entrenched social practices and positions, reading and writing lessons can shepherd girls into an adult world that they may have little ability to challenge or change... demonstrating their acceptance of

¹ Girls and Education Initiative.worlded.org. World Education.
<http://www.worlded.org/WEIInternet/gwe/index.cfm>.

the sanctioned norms for reading and writing can be a crucial means by which girls establish their understanding of the social order and earn the right to participate in it.²

Girls and women often feel underrepresented in their communities and thus are forced to adapt to the institutions set forth by those in power. If we are looking to make an improvement in women's educational lives, the mindset of limited opportunity that has been implanted in too many women's minds must be changed, and that change can be greatly advanced through increased funding for schools low on supplies so that educators, administrators, and parents can help their children excel. This may begin in funding for primary education and a fund to help the transition a girl faces socially in secondary school and beyond. If more resources are given to educators and educational administrations, there is more ability to teach, more personal relationships and a sense of personal attention that is lacking. Children, girls in particular, need this chance. Funding is an important way to start.

Issues like this can be resolved on a worldwide scale through the use of international non-governmental organizations or humanitarian projects and missions. Such projects exist and happen in many places, but, unfortunately, due to a lack of information about this important issue and the disturbing statistics it entails, many people are not aware of the grave issue many women face worldwide. As mentioned before, the imperative fact that women are more likely than men to never enter an educational system or to successfully progress through that system in many cases due to insufficient funds must be discussed in more societies. The international mountain partnership and events like the International Women of the Mountains Conference can help increase awareness and can lobby with organizations (non-governmental or governmental) to help women all over the world have the chance to achieve an education.

Increasing funding and awareness is imperative, as the Task Force on Gender Equality has stated, "investments are needed to help girls complete secondary schooling and support their transition from education to work in order to ensure safety in their future."³

²Greer, Jane. *Girls and Literacy in America: Historical Perspectives to the Present*. Santa Barbara, California: ABC CLIO, 2003.

³ Grown, Caren, and Gupta, Geeta R., and Kes, Ashlihan. *Taking Action: Achieving Gender Equality And Empowering Women*. London: Earthscan, 2005. conducted. Every study has come to accept a set of principles to increase opportunity for women worldwide.

This is the case in the vast majority of mountainous communities where funding and community placement along with male - oriented economic opportunity limit a woman's ability to achieve an education. If funding is increased for education in mountainous communities worldwide with an emphasis on increasing female literacy, the potential these communities have will be released and the regions will be more prosperous economically, safer politically, and more stable socially. That is something that will affect us all in a positive way.

When dealing with the issue of sustainable development for mountainous communities, it is common knowledge that because of the simple issue of terrain and geography, many institutions lag behind other communities in development and convenience. That is especially apparent in the accessibility mountainous peoples have to educational programs. This translates into a lower standard of living in that particular society. It is a social tragedy that translates into less economic opportunity, less technological advancement, and in most cases a less satisfactory standard of living.

Addressing this would require increased funding, as discussed before. But, assuming funding is sufficient, and physical barriers can be overcome, there is another issue that poses more of a threat to woman's ability to access to education than any other obstacle. The funding may be there, the facilities and basic institutions may be available. But if a culture is reluctant to a woman establishing herself as able to take a role in her particular community that has not been deemed appropriate by that region's history, the problem will remain and the opportunities in the community will largely be ignored. This assumption is based on studies many organizations and individuals have conducted.

Every mission statement that I have been able to find that relates to promoting a woman's right to an education includes availability and accessibility as two of the primary goals of their respective organization. Education is included in all major international human rights treaties. All countries in the world have signed unto one, if not more, of these documents, thus accepting to bear duties in realizing education as a right. In practical terms, this means recognizing that education is not merely a policy goal but consists of entitlements, obligations and freedoms.⁴

When recognized as a human right, education's importance is highlighted and people can work with different cultures to create the environment necessary for educational nourishment. In developing countries,

⁴Right to Education Project. Amnesty International. <http://www.righttoeducation.org/node/113>

where women's education faces the severest situation, certain cultures, for one reason or another have the woman placed in a set of social norms that limit her growth economically, socially, and educationally. If these cultures are to be made aware of the mistake being made in not integrating women into the workforce as equals, much prosperity and stability in unstable mountainous regions of the world that *could be*, will be nonexistent. Women's education affects the global network that must be created to garner recognition in institutions that can help our cause and increase awareness in our communities. Culture and religion, in countries that are affected by fundamentalist values or traditions must be engaged. The approach that must be taken is a cordial one based on engagement and mutual respect with cooperation. The widespread mindset that women belong in a specific place, or have specific duties must be challenged. Primary and secondary educators must work toward making education accessible to girls, and that the education is not partial and does not endorse the mindset that has made social inequality the norm in so many cases.

We need more women who are willing to speak with leaders, organize and take up the cause that influences their sometimes suppressed interests. We need more people like Martha Chavez; a worker who came to Utah after studying to become a teacher in Mexico. Martha spent several successful years teaching young children in Mexico how to read and write and decided to leave her country to come to the United States to create a better future for her family and become an asset to her community. She arrived in Utah with little material possessions, but her will and desire to help her new homeland carried her to success. Martha has become an essential part of our mountainous community. She teaches every day at a school for other immigrants, who, like her came to our community with hope, and nothing else. She works with immigrants who need to learn English. She teaches with patience all those who come to her, but in particular, finds it important to help women with a background that would limit them due to their gender. Martha teaches them how to deal with this community; she teaches life skills; she teaches communication; she teaches how to overcome, not tolerate circumstances that limit women. But what becomes the most important part of her being an educator is her personification of the "needed educated woman" that has been discussed throughout this paper who fights for her rights and contributes to her mountainous community in a spirit of humility and service to increase accessibility and opportunities for education to her fellow women and anyone else who needs her service. The pay is not what it could be, but the lasting effect Martha knows she will have on her community is worth the work. Mountainous regions need to meet the requirements set forth by their own community in educating

women. Women play a key part in our society. If The International Women of the Mountains Conference achieves anything, it must be the projection of this idea to as many as we can: women play a key part in the development of global society. Mountainous regions all over the world must acknowledge that similar to most other problems that take hold of any society, gender inequality can be combated to a high degree with education. There is a problem with providing a high quality education for women that must be addressed. The two things that we can influence and help provide in furthering women's education are funding and accessibility. This help will be very effective in advancing the cause of increasing the standard of living for women of the mountains everywhere. Organizations and conferences like the one this essay is being submitted for are good indicators of progress. This global network must be reinforced. Those involved must remember the extraordinary women already making a difference in the world. There are women like Martha all over the world. Their stories must be heard, their service must be appreciated. We must remember them, and above all, we must follow in their lead.