

Indigenous Youth as Critical Agents of Biocultural Survivance -

Education and Employment in Response to
the Challenges of Global Heating and Climate Disruption

by

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ABSTRACT

These are unprecedented times. Like never before, humans, having separated themselves from the web of life through the skillful use of their opposable thumbs, have invented the means of extinction and have systematized it for the benefit of the few at the expense of all else. Yet humans are also designing fixes and alternatives that will soon overcome the straight line trajectory to ugliness and loss that the current order would lead the rest of humanity through. The works in this dissertation are connected by two themes: (1) those humans who happen to be closely connected to the lands, waters and wildlife, through millennia of adaptation and inventive association, have a great deal to share with the rest, who, through history have become distanced from the lands and waters and wildlife they came from; and (2) as the inheritors of all the insults that the current disrespectful and wasteful system is heaping upon all true sensibilities, young people, who are Indigenous, and who are the critical generation for biocultural survival, have an immense role to play - for their cultures, and for all of the rest. The survivance of autochthonous culture through intergenerational conduct of cultural practice and spirituality is profoundly affected by fundamental physical factors of resilience related to food, water, and energy security, and the intergenerational participation of youth. So this work is not so much an indictment of the system as it is an attempt to reveal at least two ways that the work of these young Indigenous people can be expedited: through the transformation of their education so that more of their time as youths is spent focusing on the wonderful attributes of their cultural associations with the lands, waters, and wildlife; and through the creation of a self-sustaining youth owned and operated enterprise that provides needed services to communities so they can adapt to and mitigate the

increasingly variable, unpredictable, and dangerous effects and impacts of global heating and climate disruption.

DEDICATION

*For Lahly, Giselle and Flynn...
with all my love.
And for my friend the Mockingbird,
whose message still rings loud and clear.*

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PREFACE

By the time I turned fifteen, I had lived on five continents. From thirty thousand feet over the Pacific Ocean, it is possible to discern, however slightly, the curvature of the Earth. As a young teenager, I spent many hours staring at the endless expanse of blue and this was the canvas on which I went through the reels of my life. This is when I first really became conscious of our planet as a “closed physical system”, the atmosphere the thin interface between the all inward, and the all outward, between convex and concave, and the surface of the water planet, with its interspersed land masses, the biofilm between a molten interior and infinite space beyond. The curvature was discernible most during the transitions between daytime and night time, and gaining a day going east, or losing a day going west across the international date line highlighted the relativity of time and distance. Below, from time to time, a hole in the ocean would appear, and it was descending or ascending from these that in the right light, whales or other sea creatures, even manta rays or sea turtles could be seen in the crystal waters, and the coral reef transitions to land, where atolls and lagoons gave way, or grew into sand, palm trees, and lush, green volcanic mountains. The cycling of elements was evident in the tidal zones, and it was usually here that the transition between ocean and land revealed the signs of human engineering - ships and boats, docks, buildings, roads and runways. Outside the pressurized cabin of the plane was always the most comfortable temperature and breezes I ever experienced, another transition between the summer or winter of the higher latitudes and continents. And ascending from or descending into the airports was always the time of anticipation or wistfulness for the faces and smiles of the friendliest, most relaxed, easygoing, child and life loving people I had ever met.

During this time I wasn't thinking so much about what I wasn't able to see, but I saw enough to know that all was not equal in the human world. The deeper significance of the disparities between cultures, levels of wealth, genders and skin colors was not something I could make out with my limited understanding of the world. I was observing, noting, cataloguing, impressions and experiences, textures and aromas, noises natural and manmade, tastes, diversity. But I had experienced enough to know that all was not as it seemed, and there was something very wrong with the interface between heartfelt and the disingenuous, smiles and sadness. It was going back and forth over the Pacific that I became increasingly aware of my own interface, and how it contrasted with so much I loved to look at, listen to and feel, of how my whiteness and clothing could project an impression that had nothing to do with what my heart was feeling, and I began to hate being instantly classified by so many beautiful people as an ugly tourist. And this is when I really began to resent the ugly, brutal, clumsy and insensitive, slapping and stomping indiscriminate hands and feet of euro-americanization. The pieces were there on the canvas, but I hadn't begun to arrange and frame them in a coherent way. But I knew enough to intuit that paradise was getting lost.

In July, 2004, while on infant rearing sabbatical in Santo Domingo, Dominican Republic, an idea occurred to me that was born out of my then seventeen years' experience learning how to teach science to high school aged Native American students at the Santa Fe Indian School, and my eight years, specifically, teaching community based environmental science. Now, ten years later, I have amassed a significant explication of this idea, and it is my dream to bring it to reality. Though the intuition that

caused me to see that young people can play a much more significant role in solving some of the great world problems may have been mine, it comes from a lifetime of interconnections and interactions with people, teachers, cultures, societies and environments. At the risk of imparting a flavor of autobiography to this work, I will do my best to credit those inspirations that play a significant role in the overall conception of what follows, especially when sources can be specifically identified, but also when they are attributable only to exposure to the work and contributions of others that is faded and overlapping in the past.

A significant attribution must be made to R. Buckminster Fuller, whose work I was first exposed to by accident while researching a paper for a course, Selected Readings in Latin American History, taught by Professor Richard Slata, during my senior year of undergraduate study at the University of Colorado, in 1980. The paper produced, “Humanity in Transition: Blastula Formation and Differentiation,” grew out of my university experience of simultaneously considering the microscopic, time and space condensing perspectives of courses in my major, Molecular, Cellular, and Developmental Biology, which also included two years of laboratory research in the genetics of the T4 virus, and the macroscopic time and space exploding perspectives of electives in History, Philosophy and Literature. It was the back and forth exercising of these perspective extremes that perhaps helped prepare me to appreciate the work of Fuller, once I encountered it. Fuller’s work helped me understand so much about what I was thinking and feeling that I felt justified in being hopeful for the human species and the human condition, optimistic about the future, in spite of the mounting evidence that humanity’s

natural development had been hijacked and led down an unsustainable, dead end course, in what Fuller called “The GRUNCH of Giants.”

There is no dictionary word for an army of invisible giants, one thousand miles tall, with their arms interlinked, girding the planet Earth. Since there exists just such an invisible, abstract, legal-contrivance army of giants, we have invented the word GRUNCH as the group designation—“a grunch of giants.” GR-UN-C-H, which stands for annual GROSS UNIVERSE CASH HEIST, pays annual dividends of over one trillion U.S. dollars.” ... “GRUNCH didn't invent Universe. It didn't invent anything. It monopolizes know-where and know-how but is devoid of know-why. It is preoccupied with absolute selfishness and its guaranteed gratifications. It is as blind as its Swiss banks are mute. (R. Fuller, 1983, pp. 12-13).

This work is dedicated to all of the non-human world upon whose survival the integrity of the human species depends. It is dedicated to all those who developed respectful relationships with living species, lands, and waters in the past. And it is dedicated to all of the youth, who inherit the most severe challenges in history, and their energy and resilience so they may find a way through and ensure a beautiful future for their descendants.

CHAPTER 1

BRINGING EDUCATION HOME - WATERSHEDS AND LANDSCAPES AS ORGANIZING FRAMEWORKS FOR INDIGENOUS YOUTH INVOLVEMENT IN COMMUNITY AND CULTURAL SUSTAINABILITY

Indigenous peoples around the world struggle to maintain their cultural integrity, their geographical identity, their access to natural resources and non-human aspects of their world views. The life giving transmission of their language, traditions and customs through their youth to future generations is complicated and hindered by the pressures of the domineering forces of settler and corporate encroachment, facilitated by state military and legal power. The intensifying conflicts between different views of the future, between those who would seek solutions that benefit all at the expense of none, and those who would risk all for the benefit of the few at the expense of the rest, are the emerging liminal spaces of engagement and action where indigenous peoples are developing the tools to stake their own claims to a healthy, sustainable future. They are guided by the integrity of their unique knowledge systems and the wisdom of their adult elders, so their children and those yet unborn can carry forward their unique cultural signatures on a planet where diversity is the key to health. Indigenous youth are the essential agents of cultural preservation and transmission. Given opportunity and support, the young people have the power to change the dynamic from being recipients of externally imposed policies and prejudices, to internally grown, fortified, and collaboratively established positions of representation and agency in support of their unique life ways and world views.

This chapter explores the multiple benefits of engaging youth in experiential expressions of survivance (Vizenor, 2008), through the sustainable protection, preservation, and promotion of their lands and waters, through the nurturing and practicing of respectful relationships with co-inhabitants of the natural environment that are integral to culture. These benefits manifest in the individual, family, and community¹, and strengthen identity centrality, shared values, collaborative participation with other peoples, and positive images of the future. (Cajete, 2006). Accelerating and compounding stressors, such as climate change, pollution, and the massive devastation of extractive industries, evoke responses that are unprecedented. Collective action to protect environments from further destruction is evolving in indigenous governance and representation. This chapter proposes that a critical and vital aspect of cultural survivance is the active engagement of Indigenous youth in the work that needs to be done to establish place based solutions to environmental and social problems outside of, and in spite of, external state impositions or interference. It explores the ramifications of youth initiated action, drawing from personal experiences working with the Community Based Education program at the Santa Fe Indian School, in cultural and landscape preservation and promotion, and examines the impacts and advantages, economic and governance, of different aspects of sovereignty, such as food, water, and energy security, and the intangible benefits of cultural revival involving community youth, aspects embraced by what Dozier Enos (forthcoming) refers to as “Deep Sovereignty.”

Young Indigenous people have all of the abilities and tools necessary to be contributing, productive members of their communities. Their youth and opportunity to participate in home-based realities have been hijacked by a compulsory education system

that is insensitive to, and does not value, their rich cultural heritage - a form of cognition colonization. R. Buckminster Fuller wrote that “All genius is synergetic. All children are born geniuses, but most are swiftly degeniusized by the power structure’s educational system. In the guise of education, the system deliberately breaks up inherently holistic considerations into “elementary” topics.” (Fuller, 1992, p. 37). They are taught and encouraged to think that their efforts in the arts are not as valued as their efforts in the sciences and mathematics. (Robinson, 2011). They are indoctrinated to compete with each other for abstract grades on a scale that becomes a measure, however false, of their intelligence; grades that are only a measure of their usefulness to a materialistic society and economic system that is far removed from the rich spiritual and cultural legacy handed down by their forebears. This dysfunctional reality is facilitated by tribal government legal obligations and generational, social habituation to enrolling Indigenous youth in Euro-American style education institutions. Many Indigenous youth I encounter seem confused about the purpose of education and exhibit a lack of interest in the educational work they are asked to do. The purpose of this chapter is to explore watershed and landscape assessment and management as a pedagogical and epistemological framework that bridges important western educational objectives with Indigenous cognitive systems in a way that seeks to honor, support and strengthen Indigenous values, while empowering Indigenous youth to play active roles in aspiration-based forward planning and preparation for long-term cultural and environmental survival in a rapidly changing world. A positive way forward does not need to be a dichotomous choice between Indigenous and Western, which can reflect a false binary, but can be a synthesis of the best of both.

This chapter puts forth an approach to education that engages Indigenous youth in the forward thinking, ameliorative and restorative practices necessary to protect and preserve their ancestral lands for future generations in an era of ever changing environmental conditions. A curriculum that is action oriented, interdisciplinary, and based in the recognition and respect of culture and ancient life-ways, that values and honors the relationships that people have developed with the landscapes they have come to be a part of, and which is proactive, diplomatic, and democratic in its execution has the potential to make learning meaningful and community-centered. While this approach is applicable to any young person, regardless of race, gender, ethnicity, or social class, I will focus on the Pueblo tribal youth of the U.S. southwest, as that is the tribal, cultural, and geographical context in which my own experience working with youth at the Santa Fe Indian School for twenty seven years is situated.

As long as education remains compulsory in the law of the state, yanking youth from their homes and relatives to enter a world of strangers and strange concepts, new approaches to education must be developed within the context of the system that has become institutionalized. Importantly, the approach to developing a comprehensive educational framework described here does not deviate from, but instead enhances the currently promoted Common Core and Next Generation Science Education Standards that are emerging and being implemented at the national and state levels in the USA. The goal is to demonstrate that a culture-centered curriculum that engages youth in aspirational problem solving strategies for real, relevant, and contemporary problems naturally encompasses mainstream education objectives across core disciplines and exemplifies the ideals of emerging comprehensive education approaches that seek to

educate youth to take active roles in solving social and environmental problems. A question of purpose emerges. Is the purpose of education of Indigenous youth to help them be better members of their Native communities, or be productive members of a socio-economical system that does not value their cultural heritage?

Accelerating Pressures on Tribal Communities and Environment

Before examining watersheds and landscapes as overarching concepts that present many different education and action opportunities, it is worthwhile to consider the historical context and global drivers which have created the current conditions in tribal landscapes. In the expansion of western civilization land and natural resources are the premium, and Indigenous Peoples are the impediment. (Grinde & Johansen, 1995). Today, cultures are jurisdictionally confined to areas that relate more to divisions of land according to legal claims, backed up with surveys, and driven by monetary real estate values. Consequentially, the jurisdictional boundaries of tribes within the United States, and among other Indigenous Peoples with this level of land holdings, have become the lines on maps that identify the tribes, replicated and propagated on paper, digitally, on the internet, and in the courts. They offer a level of protection from illegal actions on the ground, but they disrupt the practice of spiritual and physical relationships with the waters and landscapes that are a people's universe of life, and hinder the regular maintenance of such relationships.

The physical landscapes of tribes, the lands and waters that they call home, the mountains and other features that they identify with through stories, songs, and prayers, which are the living spaces of the other animal and plant spirits that are intimately connected with health and survival, and which have been carefully observed and adapted

to as they change with seasons and cycles, are cultural spaces that are temporal, physical and spiritual. When these cultural spaces become segmented through jurisdictional definition, and fenced off or otherwise demarcated, it is as if tourniquets had been applied to parts of the body. The importance of temporal change in these landscapes is not forgotten; yet, for successive generations it becomes increasingly difficult to remain connected and aware. Youth grow up with the increasing prominence of fence lines and artificial or imposed boundaries in their understanding of their landscapes - the roads, fences, and artifacts of neighbors are more regularly experienced as geographical limitations, than the landscape features that are embedded in their cultural history are experienced through their cultural expressions of connection and reverence.

Consequently, survey lines and fence lines are insensitive to deeper cultural meanings and the rhythms of nature, the movements and migration of animals, and the ancient relationships that Indigenous peoples have evolved to holistically live within their landscapes. In order to maintain their life-ways, Indigenous peoples increasingly seek ways to access special sacred spaces without revealing their secrets, and they pursue legal acquisition of lands that lie within their ancestral domains. This is complicated by the dominance of the paradigm that land can be owned, which at its core engenders and perpetuates the concept that humans are dominant over nature. The monetary valuation of land often leads to increasingly exclusive classifications, and lands with waters, for example, become the highest priced. Federal and state lands in the southwest comprise sizable portions of the watershed headwaters that are the sources of waterways that flow into reservation lands, and so an entirely different type of relationship, with different

rules and regulations for access, are a part of the relational framework for any tribal youth trying to learn about their landscape heritage.

How does the historical involvement of youth in every aspect of cultural continuance translate into the obfuscating maelstrom of contemporary society? There have been several centuries of experience with the authoritative domination of colonization, resulting in young tribal people beset with what could perhaps be the greatest threats to their cultural survival ever experienced. The threats do not operate through the physical realm of land and nature as much as through the psychological effects of constant exposure to ways of life that are diametrically opposed to those of their ancestors. These threats challenge their values, the relationships they have with each other and the natural world, and their self-confidence and sense of identity with their culture, through education, materialistic consumerism, environmental changes, and increasing encroachment of other people into their ancestral landscapes. As their periods of disengagement with the lands lengthens, each successive year becomes more critical than the previous.

Out on the land, where survival depends upon learning age-old life-ways of observation, experimentation, skill development and practice, there are few straight lines. Other than the vectors of direction and the line of sight, nature operates in spirals and cycles, and the person learning to survive in the land learns, through experience, practice and the teaching of others, how to interpret the signs. Survival, visceral and spiritual, depends upon it. Present day Euro-American industrial education could not be further away from traditional, indigenous epistemologies. There is good reason for this. The education promoted by colonizing and dominating power structures promotes

disconnection and obfuscation in order to guarantee a steady flow of youth ready to enter the work force. Excellent effort in degrees of specialization are encouraged to support a system that separates young people from their synergistic cultural interests.

Comprehensive, naturally intuitive problem solving, the kind that the young mind is ideally suited for, isn't so much discouraged as it is not generally acknowledged nor rewarded. When a young person growing up in a tribal community witnesses, even plays a part in, summoning the cloud people on a cloudless day, and experiences the resulting raindrops on their face, there is a causal relationship that transcends the physicality of industrial education, and it is met with warmth of heart and gratitude, but also with the understanding that one is not alone, that through community and interaction with the elements there is an embracing connectivity, that intention of heart is powerful, and that the natural world responds to it. It is one borne of centuries of participation and interaction with the natural world, and the profound wisdom that all beings are connected, related by water, air, earth, and fire.

This kind of experiential learning is not acknowledged or valued in industrial education. It is not even given the credence of existence. This is undoubtedly confusing to the school age tribal child who has learned to respect the wisdom of elders who know the ways of summoning and entreating the forces of nature. In school they are taught that if it cannot be physically proven, it does not exist. The 'wisdom' of Greek logic and the scientific method invalidates their own ancient ways of learning and being. Is it any wonder that the tribal youth of today have difficulty navigating the unnatural labyrinth of specialized knowledge that is proffered as essential for survival in the modern world? And is it any wonder why so many young people rebel against an education system that

does not value their community life learning, and, indeed, why so many of them describe their school experience as ‘prison’? The Euro-American education system emphasizes competition; competition for teacher approval, competition for awards, competition for grades. Thus, students ‘learn’ that education is an individual exercise that holds individual accomplishment as separate and superior to the learning of the cohort or community, the opposite of the way learning occurs in their communities.

Mounting Environmental Challenges

All of the living, natural attributes that are key to the maintenance of tribal ways of survival are threatened by climate disruption and variability. In the North American Southwest, the disruption has begun. Rising temperatures, changing precipitation patterns, drought stressed vegetation and the consequent pressures on the survival of dependent species, widespread soil loss through inundating rains, declining tilth and failing agriculture, and wind borne dust that inhibits cloud formation are all becoming increasingly frequent problems. (deBuys, 2011). Spring tribal ceremonies to inaugurate a successful growing season, usually celebrating the spring runoff from the mountains, are met with dry streams. The gradual desiccation of northern New Mexico forests since 1998 has led to widespread piñon, juniper, and ponderosa die-off. Some of the largest forest fires in history char the landscape and threaten downstream villages with catastrophic flooding. In the past three decades, the average temperature in the North American Southwest has risen approximately two to three degrees Fahrenheit. Extended throughout seasons this difference can mean the difference between rain and snow in the winter, and the difference between soil retaining enough moisture to stay alive, and drying into a sterile dust. There is abundant evidence, from studies of plants that are

flowering earlier, and out of sync with the hatching of insects, to the earlier arrival of neotropical migrants and bears that don't hibernate as they once did, that the climate is undergoing a rapid warming, and with that are myriad cascading effects on every level of life in the landscapes. This dire scenario is likely to get worse before it gets better.

(Gutzman & Robbins, 2011). Atmospheric concentration of carbon dioxide now exceed four hundred parts per million. The last time it was that high was likely during the Pliocene epoch, between 3.2 million and 5 million years ago (Germanos, 2013).

Declining precipitation levels have manifested in legal battles for control of river water that may or may not be there. New Mexico and Texas disagree on the amount of water that New Mexico owes its downstream neighbor, and the courts have already been called into action (Postel, 2013). Groundwater is increasingly pumped for irrigation dependent agriculture. Reaches of the Rio Grande south of Elephant Butte reservoir are now dry, even to a depth of several feet below the sand in the middle. Under these conditions, every watershed, no matter how large or small, comes under increasing scrutiny, and those with the most senior water rights, the tribes of the southwest, are learning daily what is involved in keeping those rights. The tribes in the Middle Rio Grande Conservancy District have been meeting regularly with other stakeholders for over twenty years, holding their place at the table, and representing the interests of the tribes through a sort of consensual process. They are doing the hard work of protecting the water for the people, but the work to slow the water down and keep it in the watersheds on tribal lands has yet to begin in earnest.

Long, saturating rains that elders recall from their youth, are replaced by inundations that erode the life-giving soil away. Winter snowfalls are less regular and

there is compelling scientific evidence that the sub-tropical dry zone, of which the North American Southwest is a part, is expanding poleward, meaning that the increased humidity caused by higher temperatures in the tropics is driven to higher latitudes before being deposited. “The drying of subtropical land areas that, according to the models is imminent or already under way, is unlike any climate event we have seen in the instrumental record. It is also distinct from the multi-decadal mega-droughts that afflicted the American Southwest during medieval times.” (Seager, 2007, p. 1183) Reliance on groundwater for irrigation and domestic use lowers water tables and manifests in dry rivers and streams, stoking disputes. Higher summertime temperatures also mean more evaporation from open storage areas, and more rapid evaporation from soils. Thirsty plants are more vulnerable to pests.

The accumulated stresses of these changing temperature and precipitation patterns are affecting relationships among species: flowering plants and their bird and insect pollinators; migrating wildlife and safe, nourishing habitat; breeding fish and cool, oxygenated waters; prairie grasses and forbs, and their rodent and reptile inhabitants; people in the village and their many animal and plant relatives. Compounded with the burden of synthetic chemicals, bought in the store and transferred to the lands and waters through the use and discarding of non-biodegradable plastics, pharmaceuticals, cleaning and personal hygiene products, stuffed animals, shower curtains, flame retardant pillows and furniture, building materials, agricultural pest and weed control products, there is an abundance of cascading effects on every level of life in the lands and waters, and they more often happen silently, without sounding alarms, only noticed after something, some relative, is missing.

Members of fire affected Pueblos can no longer find the resources they need for their annual ceremonies in their traditional areas and must travel to entirely different watersheds by vehicle to gather and hunt. Spiritual places that hold meaning in stories and songs no longer have the special qualities they are known for, and springs are drying up. All of the watershed inhabitants are affected, realizing it when what is needed is absent. Increasing pressure on food resources that have survived inundations and fire, whole ecosystems upset by accumulated impacts, and the devastating effects on the respectful hunting and gathering ways of the sacred watershed's inhabitants, brings us to a time when only collaborative, reverential restoration and consumption can gain back the partnership with the natural world that has made possible the millennia of survivance interdependence. This is a partnership that requires the active participation of the youth who are the inheritors of limiting and culture-threatening conditions, and also the progenitors of survivance attributes.

Watersheds and Landscapes As Curriculum

In "Pueblo Watersheds - Places, Cycles, and Life," Rina Swentzell, of Santa Clara Pueblo observes, "There is the understanding in the Pueblo world that a watershed is a whole cycle of water movement within our natural world that includes the skies, the clouds, the mountains, the hills, the surface waterways, and the groundwaters beneath the surface - as well as the humans, plants, and other creatures." (Loeffler, 2012) Water is often referred to as the life blood of communities. Watersheds are communities.

Watersheds are everywhere. They encompass everything that sustains us. They contain the biological systems that we all depend on. They are perfect for exploring interdisciplinary relationships, particularly through the sciences, but also math, social

sciences, and practical arts. Students in community and place-based environmental science learn about the relationships between ecosystems and their own communities. Concepts can be introduced at levels of complexity appropriate for any age group or skill level. In the arid southwest, water and soil are crucially important natural resources and will increasingly become the main issues related to community survival and sustainability.

As an educational concept, the watershed embraces many levels of inquiry and interpretation, many different disciplines across the intellectual spectrum, in a holistic framing that is dynamic and grounded in problem solving that is aspiration-based. The following section describes aspects of an Indigenous environmental science curriculum that has been developing at the Santa Fe Indian School, in the Community Based Education Program, since 1995. Young people actively engaged in developing a comprehensive understanding of the many dynamic natural and social processes that are contained in the watersheds that make up their ancestral homelands encounter the edges of culture and social organization in both spatial and temporal senses. In class, and on field trips to work in the lands of participating communities, they examine the bases and applicability of different epistemologies in the context of the long term anticipation and planning for watershed health, and discover that the knowledge systems that their ancestors developed are valid and useful. Putting this into practice with meaningful experiences in the living and cultural landscape helps young people to (re)connect and strengthen their relationships with the legacies of their ancestors. As Lyle Balenquah (2012) beautifully expresses, “It is this connection, between ourselves and the world we inhabit, that continually needs to be rebuilt, maintained and strengthened. This can only

be achieved by actually getting “out there” among the wild places so we do not forget how our ancestors remained connected.” Shifting the focus of intellectual development from the artificially represented world of hypothetical constructs and abstract concepts, that have little relation or perceived value to the young person’s world, to the lifescapes and landscapes that are represented in their community, culture, and traditions, establishes a more grounded base from which to explore the educational disciplines and develop talents and skills. As a geographic and historical space, understanding the watershed requires the examination of natural processes and the Indigenous inhabitants. Cultural knowledge systems become essential to the conception of long term sustainability planning.

Beginning with the whole, that a watershed is an open system synergy of many different temporal, spatial and material processes, mediated by life forms that process and cycle materials in their biological drive to adapt and thrive in the watershed habitats, open to and dependent upon the deliverance of moisture by weather, one can then begin to consider questions of dynamics and health, variability, vulnerability, and the emergent properties of complex systems. Grasping a part of the whole, focusing on action towards it, and then developing in-depth explorations that engage and educate, is a powerful and effective strategy for educating and creating awareness. At some point people want to know how their activities fit in with the larger picture. That is why I have attempted to provide a framework from which to explore the many different watershed related phenomena, and the myriad connections we all have with the natural resources and processes that support the continued existence of communities at every level.

Borrowing from environmental science, it is useful to frame watershed investigations in terms of the different categories of processes and actions that occur within them over time. Synergistic intrinsic attributes are the biological, hydrological, and geological attributes that can be used to inventory, characterize, and understand the myriad inhabitants and their interactions with the elements, and which reach some state of dynamic equilibrium with the greater influences of climate and season. Energetic instrumental uses are the specific human actions that have developed over time within the watersheds. These are the ways in which humans have used the natural resources that the watersheds contain, and these uses are often the sources of stress which can upset the natural balance and threaten the health of the watershed. Examples of energetic instrumental uses are habitation, agriculture, livestock, forestry, industrial, transportation, and recreational.

The intrinsic attributes of a watershed thrive through a synergistic cycling of nutrients and essential chemicals, dependent on the presence of water. While some watersheds may be in decline, due to natural climate variations leading to decreases in biodiversity, many watersheds are threatened by the inability of the intrinsic attributes to recover from the impacts of human instrumental uses. Healthy natural systems are able to withstand periods of stress, even if they are the result of more than one pressure, such as drought and overgrazing. But as the number of pressures increases, maintenance of health becomes more tenuous, and as the accumulated pressures pass a threshold of resilience, the system begins to decline. (Rapport, Costanza, & McMichael, 1998). Unless the pressures are relieved, and even reversed, the system will decline in health. Sadly, this state of ecosystem collapse is becoming more frequent throughout the world, and in the

American Southwest the combined pressures of multiple unmitigated human impacts and the ever dryer seasons are mounting quickly, threatening large areas with ecological collapse.

Within the range of separate subjects required by the education system are found many topics that can be explored within the context of watersheds. Inquiry based explorations of micro-scale chemistry, macro-scale hydrology, biological baseline studies, inventories of intrinsic attributes and instrumental uses, practice of methodologies for monitoring and mitigation, are some of the types of STEM education (Science, Technology, Engineering, and Mathematics) that can be conducted across generations in a watershed context. The technological tools that facilitate ordering, processing, management and communication of data, and formative and summative products, are easily learned by today's youth. When the products are useful to the communities and make contributions that professional personnel within the communities neither have the time, money or personnel to accomplish, yet have a need for, the youth get the satisfaction of knowing that they have produced something beneficial and valuable.

Community Action Curriculum

Young people, without higher education experience, can provide many of the services communities need, sensitively and economically. Youth can make significant contributions to long-term community water, energy and food security through the quantification, calculation, modeling and facilitation of efficient uses, and the explication of potential societal and economic benefits. Following are some problem content areas that relate watershed health to community survival and sustainability, and utilize different

perspectives to discover sustainability options with a focus on these primary, inter-related areas of need that are critical to long-term community and cultural survival - water security, food security, energy security, and health.

Comprehensive Community Climate Change Profile, Prospectus, and Praxis (C4P3): assessment of community environmental vulnerabilities, impacts and carbon/resource footprint; planning and implementation of sustainable solutions and economical technologies for shelter, energy, water, and solid waste reduction and efficiency improvement; intergenerational education and community awareness-building services; alternative energy resource and technology evaluation and application; economic comparisons and projections of different solutions.

Water: use, consumption practices, culture, and alternative scenarios; watershed science, assessment, planning and management; comprehensive inventory of synergistic intrinsic attributes (biological, hydrological, geological) and energetic instrumental uses (habitation, agricultural, livestock, forestry, industrial, transportation, recreation); prioritization of problems and implementation of economically viable measures that unite watershed stakeholders in restoring healthy watershed balance, achieving sustainable watershed health, and increasing biodiversity; water rights, law, law making, and policy; providing assistance and support to community practitioners of watershed science.

Sustainable Agriculture: 'traditional' agricultural practices research and documentation; foodshed soil science and economics; soil conservation, conditioning and building techniques, and technology research and experimentation; inventory of arable lands; evaluation and modeling of potential, current and projected local agricultural production, practices and problems; promotion of efficient, low-impact, erosion

controlling, and soil-building techniques; efficient greenhouse technologies; heritage seed banking; physical, technical and clerical assistance for farmers who need help achieving, or improving, economic viability.

Community Health: community composite modeling of health risks and issues; health problem and solution research; identification of low-cost, efficient, intergenerational, and culturally sensitive health-building measures; health education and awareness services; implications for individual and community health of a healthy environment; providing assistance to health providers.

The introduction of the recently published Next Generation Science Standards (NGSS) emphasizes depth over breadth, practicality of application, the understanding of core ideas and the de-emphasis of learning details. Seven cross-cutting concepts are identified to “provide students with connections and intellectual tools that are related across the differing areas of disciplinary content and can enrich their application of practices and their understanding of core ideas.” (Schweingruber, 2012, p. 218). They are: patterns; cause and effect; scale, proportion and quantity; systems and system models; energy and matter flows, cycles and conservation; structure and function; stability and change (Achieve, 2013). Recently available model units, or “Tasks” (Achieve, 2013) from the publishers of NGSS, for middle school and high school, however, reveal that the focus is on developing data analysis skills, rather than understanding complex networks of multi-dimensional relationships in the natural environment (Achieve, 2013). Biological, spiritual and cultural aspects of relationships are not mentioned. This may be more relevant to students living in cities who have an orientation to development and survival in a competitive economic system, but it is less

relevant in the living landscapes of Indigenous peoples, and there is even less relevance to Native science (Cajete, 2006). All of these new standards are embraced within the comprehensive study and characterization of watersheds. In this sense, watershed studies go above and beyond these standards in helping youth understand the environment their communities are part of.

Through my work with Indigenous students I have learned that the most important ingredient in stimulating interest in learning is experience. The unprecedented nature of the challenges, coming as they are with the heat, wind and heavy rains, necessitate responses that are not prescribed in industrial models of education. As Dewey explains, “Only when it becomes cast in a mold and runs in a routine way does it lose its educative power.” (Dewey, 2004, p. 6). As one Pueblo female student put it:

This program was helpful to me in a lot of ways. I now understand more about my community and its environmental status. I hope that in the future I can still be of service to my community. I would like to pursue my career in Environmental studies because this program has got my interest in all that I have learned.

There are many reasons to study watersheds and landscapes, and there are many activities that can result in growing curiosity, related to self, the familiar and the unknown, all with the purpose of protecting, preserving, and improving the water sources and landscapes. Biodiversity assessment can engage children of all ages in understanding the plants and wildlife that inhabit their watersheds, and much of this work involves gathering important baseline information to assess the merits and potential of different preservation strategies and methodologies. Land use and management classification surveys and mapping engage youth in understanding who their neighbors are, what other jurisdictions they must deal with to protect and preserve natural landscapes, and what laws and ordinances

may, or may not, apply, or may be needed. This includes finding out who the stakeholders are, what activities might be harming or helping watershed health, and what were the historical and cultural relationships with the watersheds in the past, and how have those changed. Youth can use a variety of information available to identify and track down point and non-point sources of pollution, past and present, to understand better what chemical burdens the lands and communities bear, thus involving youth in long term examinations of watershed health.

Mapping and the development of Geographical Information Systems (GIS) can help young people inventory many aspects of their homelands, and constitute powerful approaches to aspiration-based problem solving. As a northern Pueblo male expressed:

I learned to use arcview to map my reservation. It gave me a better understanding of where our reservation boundaries end, the streams, and other reservations or cities nearby. The second thing I've learned is working together in a different community. There are many issues that we all have in common. We cannot fight with each other, but work together as one nationality to help our own environments to be safe. Mother Nature is a gift that we cannot destroy because of immaturity. We can only help it to grow beautiful. This is really a great program that any body can benefit from.

GIS mapping of watersheds, basins and sub-basins gives the youth a powerful way of developing comprehensive views of their natural resources, of stream channels and springs, diversions, dams, erosion, and fire damage. A Pueblo student in our Community Based Education Environmental Science class used these tools to understand the impacts of the Las Conchas fire and the potential flooding that can happen during inundations. Geology, soils, arable lands, vegetation types, introduced and invasive species can be visualized and quantified in order to weigh possibilities for mitigation, rehabilitation,

restoration and reforestation efforts. Comprehensive watershed assessment and management planning requires data collection and processing, and our experiences in community based education convince us that today's tribal youth are capable of making important contributions in many areas. (Ericson, 2012). GIS technology is being used across Indian country to accomplish many of these, and other, tasks. Lisa Lone Fight has realized the benefits of involving Mandan, Hidatsa and Arikara students in mapping geologically, culturally, environmentally, and politically important areas and locations on the reservation, and says that "Native people are tied to geography; we are a People of place. The very nature of being "Indigenous" demands a location to be Indigenous to... We constantly seek perspectives and knowledge of the world that explain it and the beings within it." (Lone Fight, 2012, p. 101).

Indigenous Youth into the Future

As inheritors of an increasingly uncertain world, many of today's youth question how the content of the educational paradigm is, or is not, matching the context of their lives. Ever lured and challenged by technological innovations, and encouraged by the near universal acceptance of the interactive social media platforms, such as Facebook, Instagram, and Twitter, today's young people may benefit from realizing at an early age that they can play a constructive and positive role in the survival of their parents' and grandparents' culture. Comprehensive approaches with related content areas, which are only a beginning, connected by a pedagogy that applies knowledge and experiential, community-based skills to examine the trans-generational relevance of modern environmental and cultural challenges, can illuminate the potential of purpose and influence that will connect the youth with the past, and the future. Perspective, applied as

a craft and practiced to achieve understanding, is a wonderful teacher. Imagine an issue of importance consciously approached from different perspectives: *historically*, in order to understand the conditions that have given rise to it; *locally*, to better grasp its current scope and conditions; *globally*, to appreciate the impacts of external forces; and *futuristically*, applying the other perspectives to discover options for sustainability.

A sustainable community is one that can healthfully interact with the rest of the world, absorb and adjust to changes in environmental and social conditions, and maintain a productive and engaging learning environment for its children. It must have an educational environment that operates to involve and respect its members, regardless of age, gender, and experience. Community Watershed and Landscapes Sustainability Studies can encompass all the required, and new, mental disciplines in interdisciplinary and synergistic ways. Community Watershed and Landscapes Sustainability Studies involve students and teachers alike in contextual and practical scenarios where developing skills can be practiced and applied.

As inheritors of their lands and communities, young people can learn a great deal from studying important issues related to sovereignty and self-determination. With tools developed in an action research environment, produced to provide the community with useful ways of assessing historic and current influences and conditions, anticipating changes, and preparing for new sets of conditions, young community members can play an active role in community improvement and survival.

The Santa Fe Indian School, a school that has committed to redefining itself according to cultural values and is undertaking a thorough Strategic Planning Process to remake the school, possesses enough of the necessary supports and resources to create

learning experiences that are relevant, engaging and important. These experiences would be, by necessity, interdisciplinary, emphasizing development and application of many different skills and knowledge sets. Because the school serves a population that is geographically diverse, and at the same time culturally similar, the potential exists for a growing body of student work to have a unique, substantial and lasting impact on the communities it serves.

Many of the young people that I have worked with have become involved in leadership positions in their tribal communities. It stands to reason that a good portion of the youth in school today will someday find themselves called to serve their communities. They are the future bearers of responsibility for the state of their cultural life-ways and the health of the ancestral landscapes that future generations will inherit. In the work that we have done engaging youth in community based work we have seen again and again how they are listened to when they are presenting to community members on important issues, and how their recommendations are taken seriously. In this sense they are agents of unification, bringing generations together to teach and learn, and determine what needs doing. They are catalysts, agents for action.

Conclusion

The compounding influences of material consumerism and industrial education, combined with youth and adolescence spent away from home and community, have produced a generation of Indigenous youth who know that they want to help their communities, but the educational system and the social pressures that they experience pull them away from home and increase the distance between them and their cultural and landscape knowledge heritage. Shifting the center of their educational context from the

artificial cognitive environment that revolves around curriculum that is not relevant to their cultural ways, and is increasingly distilled to testable knowledge, to the real and present conditions of their homelands is a powerful redirection of focus. Engaging them in experiential contributions to problem solving that is aspiration-based and forward looking to adapting to the increasing pressures of climate change and variability, and mitigating the impacts, will empower them to play active roles in community revitalization and preservation, protecting biodiversity, and helping to restore the intimate connections with the sacredness of all the living beings, the waters, and the landscapes in which their life-ways are based.

There are multiple benefits for communities from having their youth so engaged. The community benefits as a whole through positive intergenerational interactions, strengthening of the unique cultural knowledge system, and co-creation of new knowledge. Through active involvement of young people in cultural survivance, adult elders benefit, psychically and spiritually, from knowing that their culture will have a stronger possibility of being faithfully carried forward to future generations. The community's children benefit from having positive cultural role models, teachers and leaders in their near-peers. Young people themselves benefit from having a stronger sense of purpose and accomplishment, and from the sense of satisfaction that comes from learning and preserving ancestral cultural practices and knowledge. The community benefits from gaining a stronger sense of identity which can exert itself forcefully in the face of external challenges. Lands and waters, and their non-human inhabitants benefit from revitalized, fortified, and nurtured relationships with their human protectors. The world benefits from the maintenance of cultural diversity, which strengthens the

survivance potential of all its inhabitants. Future generations benefit from the demonstration that strength and resilience is unity, and unity is diversity.

I would like to propose that a pedagogy that is centered in community and engages youth in action to protect, preserve and promote the health of the lands, waters, and wildlife in response to the real impacts and challenges presented by climate disruption and variability is pedagogy that not only has implications for social vitality within the culture and community, but also dynamically engages the youth in cultural survivance, in the healthy transmission of culture to future generations. This becomes a multi-faceted pedagogy which: while physically practiced in the environment is environmentally conscious and humanitarian; as it involves the linguistic and culturally based transmission of Indigenous knowledge relating to the practice of the culture and the relationships with biological diversity, is cultural and inter-generational; and as it addresses and promotes water, food, and energy security is democratic, participatory, transformational and emancipatory. (Dewey, 2004; Freire & Freire, 2004; Schugurensky & Silver, 2013). Perhaps, then, when approached in these ways, this becomes a biocultural pedagogy that addresses overall community health and vitality, anchoring hope in actual inter-generational practice. (Freire & Freire, 2004).

There will be a need to tend to and nurture all of the relationships that must be established in order to actualize effective community based education. Ideally members of all the community would come to see the increased engagement and happiness in their youth. The learning would become mutual, and exponential, and because the learning is place-based, and no matter of classroom or computer experience can substitute for visiting on the ground, there will need to be access granted, and guides in attendance.

Many times it is no simple matter to open a gate. Someone needs to unlock the lock. Once the place becomes established for the study or project at hand, people come to know what their roles are in facilitating something that benefits the community and the landscape, in ways that are perhaps intangible, but which are synergistically integrated. Relationships and learning achieve a new level of mutual support. Problems arise and there are now members of all generations who can perceive their particulars. But because they are seen in the context of an active effort to identify and address multiple problems, within the aspiration of healthy sustainability, continuance, survivance, there is better chance that solutions will be dialed in to other problem solving efforts as part of the larger whole effort, and new problems created in the solving will be minimized. Emergent conditions can be assessed and engaged more efficiently and effectively.

It is essential to have the understanding, blessing and support of leadership on all sides. Once authority has been granted to a community institution to plan and facilitate youth projects, relationships immediately begin to develop between the facilitators. Logistics and support begins to routinize, and as long as community-placed education continues to receive leadership support, authority, and funding, relationships will continue to strengthen and mature. New ones will off-branch, with even the elderly and the youngest in the community becoming aware of the new community vibrancy. Leadership support for youth action can ignite an explosion of growing interest in matters of mutual concern. In a way that is perhaps unmeasurable scientifically, at some point there will be a collective registering by the life consciousness of the other living beings in the watershed that their humans are returning, the ones that they have developed relationships with since time immemorial.

CHAPTER 2

INDIGENOUS YOUTH COOPERATIVE -

AN INDIGENOUS YOUTH EDUCATION-EMPLOYMENT INITIATIVE: MULTIPLE BENEFITS OF INDIGENOUS YOUTH INVOLVEMENT IN CULTURAL SUSTAINABILITY, RESILIENCE, AND SURVIVANCE

Introduction

These are crucial times for Indigenous peoples as they face continued encroachment and settlement in the environmental spaces in which they are biologically and culturally embedded. Climate change and variability, along with socio-economic pressures, threaten the relationships that constitute the biocultural diversity and richness that colors the beautiful tapestry of nature. (Maffi, 2005; Wilson, 2008). As humanity's development accelerates, Indigenous youth are the essential agents in helping their cultures adapt and mitigate the effects of climate change, ensuring that the myriad biocultural relationships - physical, spiritual, linguistic - their people maintain with the lands and waters they inhabit remain healthy for future generations. Adapting and enhancing traditional knowledge systems with modern tools, technologies and techniques to develop food, water, and energy security will help assure the continued transmission of cultural heritage from current elders to future generations. Accelerating and converging socio-economic and environmental trends mark the nexus of the next decades as hyper-critical for the transformation of roles across generations. Indigenous youth are critical to the successful development of Indigenous cultural survivance. This article relates one novel approach to empowering Indigenous youth to catalyze and manifest changes that will help actualize successful intergenerational transmission of their unique cultures.

Indigenous Youth as Agents of Survivance

The character of survivance creates a sense of native presence over absence, nihility, and victimry... Native survivance is an active sense of presence over absence, deracination, and oblivion; survivance is the continuance of stories, not a mere reaction, however pertinent. Survivance is greater than the right of a survivable name... Survivance is the heritable right of succession or reversion of an estate and, in the course of international declarations of human rights, is a narrative estate of native survivance. (Vizenor, 2008, p. 1)

Survivance brings to life the process of survival as a “renewal and continuity into the future rather than memorializing the past.” (Kroeber, 2008, p. 25). Here, survivance is a dynamic process that continually engages the non-human world through interaction, adaptation, and support, meeting challenges and threats with the cultural attributes, values, and strengths that are uniquely evolved and adapted by Indigenous peoples to their specific environments. Survivance, in this case, is dynamic, responsive, and adaptive, and requires the engagement of the community’s generations, faculties, and qualities. Survivance is not temporally anchored, but is as fluid and relentless as time itself, and, thus, cannot be described accurately in static terms.

I offer that when an Indigenous community’s young people are engaged in the community’s survivance, benefits manifest in the individual, family, and community; all of the people who are related and indigenous, through many centuries of attachment and survival, through survivance, to a specific geographical location. Youth engagement strengthens identity centrality, shared values, intergenerational interactions, and collaborative participation with other peoples. When a community’s youth are actively involved in cultural survivance, knowledge systems that have developed dynamically

over many centuries are reinforced and fortified, ascending to relevant dominance over any externally derived or imposed belief systems.

The accelerating and compounding stressors, such as climate change, pollution, and the massive devastation of extractive industries, evoke responses that are unprecedented from today's remaining Indigenous Peoples. Collective action to protect culture and native environments from further degradation and destruction is evolving in Indigenous governance and representation. But unity in action, such as demonstrated through community response, is also evolving as a dynamic necessity to comprehensively address many accumulating challenges. This article proposes that a critical and vital aspect of Indigenous cultural survivance is the active engagement of Indigenous youth in the work that needs to be done to establish place-based solutions to environmental and social problems outside of, and in spite of, external state impositions or interference. This proposal explores the ramifications of youth-initiated action in cultural and landscape preservation and promotion, and examines the impacts and advantages - social, governance, and economic - of different aspects of sovereignty, such as food, water, and energy security, and the intangible benefits of cultural fortification involving community youth.

Accumulated stressors and traumas (such as mainstream Euro-American education, heritage language suppression, pollution, and degradation of lands and waters) affect all levels of individual, family, and community health. Disintegration of relationships is the modus operandi of modern industrial society, particularly the splitting apart of relationships with elements of the natural world. These are the relationships that are supportive of cultural unity and cohesion, and which acknowledge the need for

healthy diversity, but which the homogenizing social forces driven by competition and private gain need to discourage and destroy in order to maintain and perpetuate flows of monetary wealth. (Stromquist & Monkman, 2000; Quan, 2012). With the growth of competitive, not egalitarian, globalizing trends of materialistic consumption, environmental destruction, privatization and individualism, threats to Indigenous localism are compounding. But at the same moment in history we see the development of unprecedented levels of unified collaborative action among organizations and individuals dedicated to protecting and maintaining Indigenous social and environmental integrity, working to influence a change of direction from disintegrative destruction to integrative vitality. A liminal space of possibility has opened up, drawing action from many agents, dynamically expressed in the collaborative actions of NGO's, government agencies, and individual actors, to challenge the pressures of a repressive economic and social system that forces conformity with selfish goals. The possibility for Indigenous youth to inhabit and form this space is tangible, promising, and essential. (Sumida Huaman, 2014)

For 27 years I have been an instructor of Indigenous, high-school aged youth, focusing on local community-based curriculum development. As an educator, my experience has been that the majority of Indigenous young people today wish to participate more wholly in the strengthening, preservation, and continuance of their cultures. Perhaps if they are given the love, support and opportunities to actively do so, they could dedicate their energies to restoring, revitalizing and strengthening their Indigenous relationships with the natural, non-human world. This process contrasts with relationships that are externally imposed through mainstream economic marketing and manipulation, involve synthetic materials, disrespect, and degradation of the natural

environment. Threats to cultural integrity, in magnitudes perhaps never before experienced, are multiplying rapidly as social, political, and economic forces combine to encircle the planet in a shroud of conformity. The diversity of cultural, place-based wisdom that supports and promotes the healthy maintenance of respectful relationships with natural environments is critical to a healthy future for all humanity, and must involve the very youth who will inherit the conditions that challenge the continuance of culture, the continuance of Native language, and the perpetuation of customs and respectful relationships that are integral to culture.

The Global Problem of Youth Disengagement and Unemployment

Worldwide, youth unemployment is an increasingly influential driver for geographical expressions of extractive commerce, involving state governments, policing, state imposed education systems, and strict market controls. Social engineering to control purchase and consumption patterns reaches through the generations, fueled by technology and media innovation in the service of capitalism. This market-based force has the power to reach into the consciousness of exposed individuals, and the overall message is designed to disconnect purchase power from cultural responsibility, respect for relationships with the non-human world, and the reciprocity that is fundamental to community health. (Maffi, 2007).

Conscious decisions that acknowledge the manifestations of external and unintended consequences of actions that are considerate of whole systems are actively discouraged with confusing messages about their insignificance or unimportance. Young people have a stake in the future, and it is my experience that they are increasingly aware of the inconsistencies between their desires to contribute communally, and their socially

manipulated loyalty to the disconnecting and polarizing effects of the nonspiritual consumer system.

The global implementation of sustainable solutions to the problems associated with population growth, increased resource consumption or depletion, and the accelerating and compounding effects of climate change is frustrated by many factors, including the global problem of disaffected youth and youth unemployment. All over the Earth, young people are challenged to discover how to survive in a rapidly changing world. If they are fortunate enough to have access to education, the educations they receive are most often based on European American industrial education models that were designed and structured according to traditions rooted in workforce creation and economic competitiveness, inherited from the 20th century. (Robinson, 2011). At the same time, young people witness wide-scale destruction of the environment and increasingly evident regional and local impacts of global climate change. They are keen to note that these calamities are closely linked to the unsustainable growth doctrine and system of economic competitiveness in which they must ultimately compete.

Indigenous youth, found throughout the globe, struggle at the interface between unhealthy and unsustainable, and aspirational and comprehensive. The most observable fundamental factors in the physical strength and resilience of Indigenous Peoples are food, water, and energy security, and the continuity of culture and Native languages through their young people (Sumida Huaman, 2014) – that is, the survivance of culture through intergenerational conduct of cultural practices and spirituality. Perhaps the more self-sufficient Indigenous peoples are, the more inclusive of youth cultural practice will be. If a society grows its own healthy, traditional foods, and actively engages in the

management of the watersheds that its culture depends on so that species and landscape relationships are nurtured and supported, and if it generates its own energy, that society will be less dependent on the outside world, and better able to live in harmony with the nature it is a part of, in ways that ensure health and sustainability for future generations. In this scenario, youth are the living conduit for the transmission of Indigenous knowledge and technologies from elder to future generations, and, Indigenous knowledge systems can thrive when youth participate in their survivance.

Essential Elements of Community Survivance

Many communities are growing in population, dimension, and complexity. With this growth comes increasing demand for natural resources, and infrastructure development. In order for this growth to be sustainable and minimize or reverse degradation of the local environment, innovative design, comprehensive aspiration based planning and problem solving, and broad implementation of efficiency technologies and practices are essential. Stresses and strains on community systems and aging infrastructure necessitate solutions that are often addressed through short-term efforts and are dictated by budgetary constraints or opportunities. Comprehensive planning and long-term solutions are needed to avoid increasingly costly reactive responses as exacerbating conditions accumulate. Some intended solutions create more problems. As the unintended consequences of narrowly focused solutions become compounded, negatively affecting facets of community and culture that are profoundly linked with the natural world, environmental quality monitoring and assistance can prevent actions that are compromised and wasteful. Actively promoting the healthy regeneration of lands, flora and fauna diversity, fertility of soils, and active management of watersheds for

sustainable use by multiple stakeholders gives the community leverage and influence to protect sacred spaces that might be outside legal jurisdictional boundaries.

Countering claims or assumptions of non-Indigenous populations that Indigenous Peoples are not successful in managing themselves or their natural resources is a critical step in achieving increased power for self-sufficiency and self-determination. Thorough inventories of natural resources in ancestral lands give Indigenous communities the knowledge they need to claim management authority, challenge external encroachment, align their efforts with other state and non-governmental natural resource conservation entities, and pursue legal recourse for prevention of further degradation by corporate interests that actively pursue natural resource extraction on lands within Indigenous ancestral domains. Positive working relationships developed between Indigenous and non-Indigenous people working for the same conservation goals can be a powerful deterrent to rampant resource exploitation by private interests, creating the liminal space and context for action that can influence governments to legislate more fairly, weakening incentives that make it possible for corporate interests to take advantage of perceived vulnerabilities in Indigenous community cultural cohesion and integrity. Furthermore, if youth in Indigenous communities have opportunities to live in their communities, take part in their culture, and earn a decent living while protecting, preserving, and promoting the health of their lands and waters, and all their non-human inhabitants, then the overall strength and resilience of the entire community will be positively impacted. This has implications for governance and self-determination, for it fortifies the integrity of the distinctiveness of the community and gives it greater credibility and power when dealing

with states, other stakeholders that share the landscape, and with other Indigenous peoples it might align with in common cause.

Long-term food, water and energy security are attainable through a variety of efforts at the local level, involving community members of all ages, culturally important knowledge and practice, and dynamic interactions with the environment. If they are given the trust, responsibility, and opportunity, I contend that young people in the community are capable of providing many of the services their communities need to become more self-sufficient and secure. It also makes sense to involve youth in the achievement of self-sufficiency and security as they can catalyze inter-generational cooperation and communications, and they will comprise future leadership. Achieving sustainable community self-sufficiency, and effectively mitigating and adapting to the impacts of climate variability and disruption will require interdisciplinary investigations and applications in multiple areas of concern, including the following.

Water

Clean and sufficient water supply relates a key problem of cultural survivance among all Indigenous peoples, particularly in arid regions, or in areas where water supplies have been compromised by pollution, wasteful use, and climate changes. But even in areas of abundance, where water is exploited for energy generation, Indigenous communities suffer loss of land and habitat to large-scale reservoir and hydroelectric projects. Regardless of local conditions, the sacred significance of water in Indigenous cosmographies unites people of all cultures in a struggle to ensure a healthy future for generations to come.

All over the world, in every region, increasingly, concerted efforts are underway to develop and institutionalize watershed assessment and management policies and actions that maintain healthy and abundant access to clean water supplies for all the watershed stakeholders, Indigenous or settler. Youth can play a proactive and influential role in conducting the baseline studies that are so necessary for inventorying threats to water supply and the biodiversity it supports, for all stakeholders. Young people have power in being able to achieve consensus among watershed stakeholders in reducing threats and impacts on water supplies for healthy ecosystem function, agriculture and other essential uses.

Well established, as well as newer, emerging technologies that can clean polluted water inexpensively, improve the efficiency of water use, and recycle used water for further use, offer advantages and opportunities for those communities that can put them into practice. Communities that have an 'efficient water footprint' have clout in multi-party negotiations about proposed water projects that may have detrimental environmental effects on sensitive habitats and ecosystems. Indigenous People have a stake in providing a voice for ecosystems and species with which they are intimately connected, but which cannot represent themselves in exploitative corporate / government water grabs. Organization and efficiency strengthens that voice, and the youth can deliver it with greater influence than older generations, for they are both inheritors of current conditions, and progenitors of future circumstances affecting life and culture.

Earth

Agrarian, herding, and hunter-gatherer traditions alike rely on healthy soils to provide the nourishment that Indigenous peoples require, but which also forms much of

the basis of their interactive customs, traditions, music and songs, prayers and dances. The range of adaptations to local conditions is vast, from desert to rain forest, coastal to mountain top, but the commonality that unites all Indigenous Peoples is the fertility of the soil to support the plants and animals that their relationships with the non-human world are based upon. As settler and industrial encroachments, erosion and widespread pollution deplete and contaminate existing soils, protecting and nurturing the soils that remain, and reclaiming and rebuilding those that are degraded, is imperative if Indigenous cultures are to survive long into the future. Fortunately nature responds quickly to helpful actions and, once given support and a chance to heal, can regenerate and become more fertile. This affects all the biota associated with those soils, and healthy soils increase the biodiversity, which is the basis for Indigenous sustenance, cooking, medicine, healing, and stories.

Traditional soil maintenance practices that have been negatively impacted by policies separating youth from community for ‘education’ and acculturation have suffered. Traditions of Indigenous youth participating with elder generations in agrarian and landscape maintenance cultural practices that teach reverence and care for the land through specific language use and techniques adapted over centuries, are valuable knowledge sets that hold the key to relationships that can revitalize and maintain soil productivity. Identifying opportunities and taking action to heal soil, through erosion control, fungus stimulation, and composting, for example, offers a variety of ways that Indigenous youth can engage in the most fundamental aspects of cultural maintenance, related to food production, language and tradition preservation and perpetuation, and promoting genetic diversity and seed adaptation and viability in changing climatic

conditions. Adapting new, energetically passive, and non-toxic technologies to increasing soil fertility and productivity benefits communities by making them more self-sufficient and less dependent on external sources of aid. A community whose youth are actively involved in nurturing and maintaining soils and agricultural tradition has a more powerful claim to natural resource and property rights in preference to externally derived and imposed land use laws.

Fire

Another area of opportunity for identity strengthening is in the development of efficient, renewable, and independent generation of energy. Electricity and other energy sources can best be used to local advantage if they do not carry the dual burden of having to be imported and being generated at the expense of the natural environment. A community that can generate its own useful clean energy sources and use them in ways that are not wasteful is a community that can more easily realize energy and economic independence. Emerging technologies - efficiency maximization followed by application of renewable energy technologies such as solar, wind, hydro, biofuels, for example - make it abundantly applicable to almost any landscape and environment to produce clean energy for people who inhabit those spaces. Young people have a tremendous opportunity to play a key role in achieving this energy independence, as they have the interest and aptitude for rapidly taking advantage of new technologies that can assist their elders in achieving greater energy independence. This is another area of convergent mutual interest with organizations and policies that encourage and support development of environmentally sensitive clean energy sources. Reduction of energy use through efficiency optimization, decentralization of energy production through increased use of

emergent technologies to harness abundant renewable sources, and further optimization through recursive design processes, (Lovins, 2013), makes sense environmentally and economically, and it positions communities to more successfully oppose state and corporate efforts to exploit ancestral lands for energy resource extraction and production.

Air

Indigenous communities look to their youth to learn the language and culture, and pass it on to future generations. When youth are removed from community through enforced educational policies that separate them from their families, clans and societies, all cultural integrity suffers through broken relationships and lack of continuity. Just as breath is essential to life, so is communication, and youth have a specific and vital role in strengthening and maintaining lines of communication, as the recipients of cultural language and knowledge, and as keepers, protectors, and relayers of Indigenous knowledge to future generations. Language is critical to cultural survival. (McCarty, 2006). Modern communications technologies can be used to educate and inform community members, providing information on initiatives and practices related to reclaiming sovereignty over lands and waters, agriculture, maintenance and promotion of biodiversity, and energy use and production, creating culturally relevant consensus of purpose. Youth can facilitate this in a community communications, native language atmosphere. Young people are technologically curious and savvy, unlike older generations that struggle to learn how to use the Internet and wireless communications capabilities. These emerging technologies have the power to unite, as is demonstrated daily in countless ways around the planet. In Indigenous communities, particularly those that are already embedded in societies where these technologies are widespread, or in

geographies that are vast and where community members are spread out over the lands and waters, modern communications technologies offer opportunities for transmission of vital cultural information, dissemination of agricultural and energy guidance, and as a means to inform and unite community members in culturally vital efforts. They also offer ways to communicate cultural humor and optimism, important characteristics of indigenous communities and culture.

Indigenous Youth Cooperative²: Envisioning an Indigenous Youth Education Employment Initiative

An egalitarian model for business conduct, where young people, in this case Indigenous youth, have the authority to allocate spending to take action on decided priorities in realms that enhance collective self-determination, would have a strengthening effect on communal continuity and resilience. Perhaps it is too much to envision a mutation of the education system to become more culture-centric in the near term, but Indigenous Youth Cooperative, a project being developed to engage and gainfully employ Indigenous youth in the preservation, protection, and promotion of their culture, language, lands and waters for future generations, offers an opportunity to productively engage those youth who are culturally motivated and haven't left the community because of their success in an externally derived education system. A local organization, staffed by gainfully employed community youth, providing needed environmental and other services, whilst receiving training and skills enhancement, would do much to move their community in a trajectory that enhances and supports cultural survivance.

Indigenous Youth Cooperative is developing as a youth owned and operated business enterprise, which will provide needed environmental and community sustainability services to Indigenous populations in response to corporate, state, and settler encroachment. It anticipates and responds to further impacts, stresses and threats to community, culture, and environment by the increasingly unpredictable and severe manifestations of global heating-induced climate changes and their manifestations in disruptions of cyclical lands and waters life patterns. It will employ post-high school, pre-college youth - those who are uncertain about career paths, who are culturally based in community, and who are interested in making positive contributions to their community.

The organizational model for Indigenous Youth Cooperative is the Workers Self-Directed Enterprise (WSDE³). Benefits to community include: creating a viable mechanism to address the very severe problem of youth unemployment; model an emerging business model that is self-directed by employees; promote intergenerational family and community-strengthening communications and relations between community members; build environmentally progressive consensus between Indigenous populations and other stakeholders who inhabit critical watersheds and habitats; help generate a practical valuing of Indigenous world views and life-ways; and help preserve the species diversity and natural attributes of the landscapes in which these Indigenous populations continue to live. Key components for the comprehensive success of Indigenous Youth Cooperative are water security (Water), food security (Earth), energy security (Fire), and community-supportive and dynamic communications (Air).

The Indigenous Youth Cooperative project engages youth in the Indigenous community who have not had positive experiences on which to base their interests in

state imposed education systems, the youth who do not have a clear idea of a future path, and the youth who wish to stay close to home to continue to learn and practice their culture. It is a plan for the employment of youth to provide important community sustaining services that can help the community meet the demands of preservation and growth in healthy and supportive ways. Youth participants will receive training in a variety of disciplines that will increase their skill base and self-esteem, allow them to discover and develop their interests and talents, and give them the experience of being valued and productive community members. Their experiences will increase their prospects for further education and career development, while they prosper through gainful employment to deliver needed services to help shape and build a lasting and positive future for the community they are a part of. This article explores the potential dynamics of the function of Indigenous Youth Cooperative in the sphere of Indigenous governance and state relations, and the benefits for helping to improve and strengthen the sustainability of Indigenous self-determination and cultural survivance.

Indigenous Youth Cooperative does not exist separately from, or in competition with, established community institutions. Rather, it exists complementarily and is socially embedded. There is no drain on local coffers, as it does not rely on precious community economic resources. Rather it enriches community by promoting and implementing solutions that save resources and keep them in the community. Its function within community and environment is to heal and fortify. The workers will develop productive relationships with others who are within community and without - personnel of government agencies, private landholders who are stakeholders within the ancestral domains - helping to build consensus for actions that are respectful of relationships with

the natural world, and responsible to future generations. Orientation must be thorough for success. This is very different from colonizer research in that it produces “good numbers” or *naryi kati*, as Maggie Walter explains, quantitative data that “privileges Indigenous voices, knowledges, and understandings.” (Walters and Andersen, 2013, p. 86)

Community-Supportive Research

In order to actualize projects supporting water, food, and energy security, and cultural resilience, Indigenous Youth Cooperative personnel will need to conduct research in and around the community, and in jurisdictional, as well as extra-jurisdictional ancestral lands. They will need to interact with community members as well as neighbors, and in cases where the jurisdictional landlords are federal, state, private, or corporate entities, they will need to interact with different levels of organization management. A framework that maps the types of data needs, their gathering considerations, and management options would be useful as the work of Indigenous Youth Cooperative proceeds so personnel have an understanding of the issues related to research and data gathering that is as comprehensive as possible. It will, like the nature of Indigenous Youth Cooperative as an evolving entity, by necessity be incomplete. But the intention of this effort is to lay a structural framework that can serve as a jumping off point, as well as help sensitize personnel, supporters, and critics alike, to the importance of being thorough in consideration of cultural and historical sensibilities regarding data gathering and management.

Very important in any data gathering and processing effort is complete and open communication with leadership and other entities within communities. This is an important priority for any project and its success. Prior to any effort to gather data, a

memorandum of understanding between the community's Leading Authorities and Indigenous Youth Cooperative must be agreed to. The basis for this understanding will be a thorough explication of the type of data that will need to be gathered, how it will be analyzed, and how it will be used to further community beneficial projects. Historical experience has created suspicions and mistrust among Indigenous Peoples as regards data gathering and analysis, and it is essential that, for Indigenous Youth Cooperative efforts to succeed, this initial process be part of every project protocol. It is also essential, for project success, that, in cases where data needs to be gathered from community individuals or households, all interviewees and program participants be consulted in ways that are completely respectful, edifying, and assuring that any project has the blessing and support of community leadership. Beyond this, efforts must be made to enlist the help and input of community members. Data that extend beyond community and into the landscapes and waters need the blessing of appropriate authorities, and in the inevitable cases when data must be gathered outside jurisdictional lands, the support of leadership will be important in eliciting participation and access from other controlling entities. It is also salient that other community institutions with established relationships with neighboring entities and jurisdictions be consulted and assured that the efforts of Indigenous Youth Cooperative will not be repetitive, but will formative to the overall knowledge of conditions within the community, lands, and waters. To this end Indigenous Youth Cooperative efforts must be perceived as enhancing and empowering, and never be distracting of the efforts other community entities.

It is essential for the success of Indigenous Youth Cooperative that personnel approach qualitative and quantitative research in ways that will not alienate community

members and personnel of other community entities. This can be difficult for a number of reasons. If there are people in the community that are suspicious due to past experiences with data gathering efforts by outsiders, they may be disinclined to participate or be truthful. Another problem that could conceivably hinder research is the sense of territoriality that sometimes comes with jobs or positions of authority within community institutions, particularly if those positions involve research that has been based in training in Western quantitative methodologies, or is the result of project deliverables in the service of externally derived funding grants, such as from the EPA, DOE, US Forest Service CFRP or FEMA. It will become important that Indigenous Youth Cooperative personnel be very grounded in the standpoint of their research methodologies, and be able to clearly communicate that they understand and consider community epistemology, ontology and axiology.

Personnel need to understand that centering research methodologies in the unique standpoints of their own communities is fundamentally different from anything they may have done before as part of Western education or employment. Through their thorough examination of research in Indigenous communities, the works of Smith (1999), Wilson, (2008), and Walter and Andersen (2013) will be very helpful for developing statistical and phenomenological models that are useful, positive, edifying, and integrated with holistic community, land, and culture survivance.

The areas of investigation where qualitative and quantitative information will be required to inform further process can be conceptualized in a manner that reflects the epistemological biocultural framework of community - lands, waters, and non-human relationships. It can also be organized according to projects that fall within the broader

systematizing constructs of the essential elements that are relational to Indigenous world views - water, earth, fire and air. As such, following are some likely tasks and examples, supporting comprehensive community threat assessment and solution implementation, most of which can be integrated with geospatial mapping and a developing Geographical Information System (GIS) relational database which is either supplemental, or complementary, to existing GIS within the community, and which is transparent and accessible by community members, and does not exist in isolation.

Following are concrete examples of programs and the types of data that they require. This is by no means an exhaustive treatment but is only intended to exemplify the kinds of data, and their gathering particulars, that will be required for Indigenous Youth Cooperative to accomplish its mission.

Specific Examples of Applied Research by Indigenous Youth Cooperative Personnel

Rapid Community Energy Efficiency Transformation – To expedite community carbon footprint reduction by increasing energy efficiency, as an initial step in a process that overlaps with renewable energy integration, hard energy consumption data for homes and other community structures must be obtained to calculate current energy related expenditures. This energy audit data, including light bulb and appliance inventories, and building envelope insulation data, can be used to a) project monetary savings through efficiency improvements, b) build a convincing case for funding of renewable energy (e.g. solar photovoltaic) technology implementation, c) obtain leadership support and convince community members to participate, d) and build the case that energy efficiency and renewable energy production is consistent with Indigenous axiology.

To carry this out, it is important for personnel to first develop awareness in the community about the purpose of the project, and obtain leadership support so that they may gain access to utility bills and be allowed to conduct energy audits.

Community Toxic Chemical Burden – This program would assess the extent to which community members, particularly the most vulnerable, the youngest, are exposed to harmful synthetic chemicals, and provide alternatives that are non-toxic and environmentally benign. Access to homes and other built environments, agricultural fields, etc., anywhere that such toxic chemicals might be used or stored, and identifying sites that need to be remediated, requires trust and openness among community members. Creating inventories in order to locate and quantify risk factors and exposures can threaten community members' habits and loyalty to products. It also creates the potential that community members who are not aware of the risks and dangers of certain man-made materials might be perceived as unformed or uneducated. Great care must be taken to avoid alienating community members by presenting information or questioning in ways that are sensitive and edifying. This may involve convening community meetings and development of information materials. Healthy alternatives need to be provided in positive and economically affordable ways, or, better yet, for free. Again, community awareness of the purpose of the project and the support of community leadership is essential to success.

Protecting, Preserving and Promoting Culturally Significant Endangered Species - Conducting baseline animal and plant studies, identifying umbrella species for protection, and working with other, non-Indigenous stakeholders in critical habitats, and implementing plans to mitigate damage in watersheds entails several kinds of risks.

Knowledge of culturally important species may be specific to clans and seasonal hunting or gathering, as culturally significant activities might clash with conservation goals, dividing community. Implementation of conservation plans may very well bring community members in conflict with non-Indigenous landholders or enterprises that see their economic interests threatened by environmental prescriptions. Good data analysis and management, informed by external studies, will be important in enlisting the partnership and support of governmental entities, such as the Forest Service, Fish and Wildlife, etc., and non-governmental organizations, when conservation efforts extend beyond jurisdictional boundaries.

Comprehensive Community Climate Change Profile, Prospectus and Praxis

(C4P3) – Community based research and actions carried out by Indigenous Youth

Cooperative personnel in support of achieving comprehensive community water, food, and energy security, and supporting communications and health, are summarized in Appendix A. these research-action projects will generate new knowledge for the community, and have on-the-ground environmental, as well as community benefits.

Youth Check-in: Literature and Indigenous Youth

In an effort to better understand the feasibility, receptivity, and precedence of Indigenous Youth Cooperative, an Indigenous youth owned and operated business to provide climate change mitigation and adaptation interventions in indigenous communities and domains, a critical literature review was undertaken. However, because youth are dynamic beings, literature alone is not sufficient towards understanding how the ideas of Indigenous Youth Cooperative might be received, rejected, negotiated, and/or

transformed, the practice of “checking-in” with Indigenous youth via informal conversations was also an important piece of the Indigenous Youth Cooperative concept formation. Tribal youth, in the southwestern U.S., 16 to 18 years of age, who make up the target demographic for Indigenous Youth Cooperative, were involved in a series of informal conversations regarding their own perceptions of the status of environmental issues within their local communities, their thoughts about the impacts of climate change, their desires to be employed within their communities, and the notion of Indigenous Youth Cooperative.

The literature review revealed that while there are numerous examples of cooperative youth enterprises, mainly in urban settings, some of which addressed sustainability and green business, none could be accessed that addressed three key criteria of investigation: Indigenous, Native, or Tribal youth; cooperative enterprise or worker cooperative; and climate change or sustainability. While there is much scholarly work reporting and analyzing the promotion and effectiveness of indigenous enterprise, especially in the Arctic, Australia, Canada, Latin America, and Africa, no examples were found that involved business models with youth ownership. United Nations and World Bank programs emphasize the problem of youth unemployment and the importance of fostering youth enterprise in the context of climate change adaptation and sustainability. (Worldwatch Institute, 2007). With respect to indigenous peoples, a few examples were found of programs that focused on indigenous youth promoting entrepreneurial ventures related to conventional industries, such as tourism, agricultural products, and arts and crafts. The literature was illuminating in many ways, including the result that no

examples of the model envisioned for Indigenous Youth Cooperative were found. (See Appendix B).

In order to gauge how students would envision working in Indigenous Youth Cooperative Enterprises, a series of four interviews were conducted, with four different groups, numbering from five to twelve students. The students were all fifteen to eighteen years of age, seventeen girls and fourteen boys. I explained the concept of a youth owned and operated enterprise to research and carry out projects in support of community water, food and energy security, mitigating and adapting to the impacts of changing climate and the social, cultural and technological challenges they pose to cultural resilience and survivance. The participants were asked to imagine being able to live and work in their communities in a business that they were co-owners of: a business that would employ them to care for their lands and waters, help their communities become more energy efficient, and involve them in growing healthy food. They were told that they could organize the business any way they wanted with relation to responsibilities and hours, but that they would likely have to learn different tasks so they could help each other, as well as become expert in some roles. They would be given opportunities to travel, receive training, and once or twice each year, travel and spend a week with the other personnel of other branches of Indigenous Youth Cooperative from other indigenous communities. They would also be in regular internet contact with the other branches, sharing information and operational ideas. So that they didn't view their work in competition with other community institutions, they were told that they would not be in competition with other tribal members, and that their budget would not come from the tribe (the business would not be subsidized by their tribe), but that it would be generated by the

work they did. They were told that there would be a \$2000 entry fee, refundable if/whenever they chose to leave, and while they were co-owner workers they would share any surplus revenue that their work generated. The interviews were informal, loosely guided, and were no longer than forty-five minutes.

When asked how they would organize themselves, all groups arrived at the same conclusion: task assignments would be based on identifying “individual strengths and interests” by a process of consensus decision, and that they would “share responsibilities,” “multi-tasking,” “teamwork,” and “sharing management,” including making decisions on how to budget their operational and project expenses. When asked if they would prefer to work an eight hour day, or set their own hours, there was unanimous agreement that they would prefer to be able to work when they chose, as long as the work got done. When asked how they would know if the work was getting done, students in all the groups offered that a system of mutual oversight with self-reporting of progress on projects would be best, and one student suggested that people get paid by the work they did, rather than the hours they worked. All of the participants liked the idea that they would be able to take off when they wanted to attend to family and community responsibilities. One said he liked the idea of being able to work on his own, “for himself and others.” Another imagined generating income from selling specialty plants from the greenhouse, and another from installing solar panels to electrify the community naturally. Several participants liked the idea of being able to do a “radio station” for the community, to “keep the people up to date on what is happening” around the community and in the work they were doing. One participant said he could see the ‘office’ becoming a place where people would like to “come and talk about stuff.”

The interviews were revealing. No one was opposed to the idea of being co-owner / workers in a business that would help their communities and lands. There was a general excitement at the prospect. Further informal interviews were conducted with two seniors who have exemplified interest and concern in their communities through their strong academic research and preparation. Both agreed to share their ideas about how personnel of Indigenous Youth Cooperative might conduct research and data gathering in tribal communities. Both students are serious about their educations, and are deeply involved in their culture and communities. Their responses to the prompt are summarized below.

Female (17) from southern Pueblo: *paraphrase*: It would be best if they (enterprise personnel) know and practice the culture in the community. It's important that they know the language and the protocols for greeting and respect when entering homes so people will want to talk. They need to establish the appropriate relationships before asking questions. It helps to identify yourself and the family you come from. "If they don't know the language, elders might not speak with them because they forgot who they are."

There are a lot of youth who want to remain in community but don't have employment opportunities. Many young people in the community feel caught between two worlds. "I struggle with this myself on a daily basis - wanting to stay at home and help, and having to leave in order to get further education to ultimately make money."

Male (18) from southern Pueblo: *paraphrase*: It would be important to invite community members to a presentation, some kind of panel, where they can come hear about and ask questions about the types of research that the personnel would like to carry out. This would help establish a positive, trusting relationship before doing the research.

It is important to pay attention to cultural protocols and use the language as a respectful gesture. Once a relationship of trust is built then people will want to help.

Discussion: Multiple Benefits

Indigenous youth experience benefits from being appreciated for their contributions to the survivance of their communities and cultures. Young Indigenous people often leave their communities because they lack opportunities for employment. Along with all the other stressors that fractionate Indigenous communities, the absence of viable employment options leads many of them to seek a future outside of their ancestral domains among foreign cultures with different knowledge systems. This further removes them from the daily intergenerational activities that are the currency of culture. Those that are drawn to remain with their families and communities need ways to productively engage while providing livelihoods that are sustaining to their families, elders and children. If the youth are supported to ensure healthy food, through sustainable agriculture and animal management, which is informed and tuned through the application of cultural knowledge and low-impact, emerging technologies, and not oversimplified by the application of “generalized remedies” (Bebbington, 1993, p. 276) stemming from green revolution trends, then they will choose to remain, keeping traditional knowledge alive while taking advantage of other beneficial technologies that advantage production.

If supported to ensure clean water availability they will be connected to essential life giving aspects of culture and knowledge derived over many generations. If allowed to contribute to community energy sustainability through the implementation of sustainable energy production technologies, which neither compromise the natural environment, nor impoverish the economic resources of the community, then they contribute to the overall

strength and resilience of the community in unprecedented times when peoples worldwide are increasingly called upon to do the same. If they have the resources to develop networks of communication to support cultural practices, as well as interventions that strengthen sovereignty and cultural self-determination, then they establish and legitimize their role in cultural survivance in a world which is changing and daily presents unprecedented challenges to survival.

Young people who help to maintain the health and well-being of their community members, their language, and their cultural traditions and customs, through active mitigation of threats to the very natural elements that are essential to cultural survivance, and by actively adapting to changing environmental and social conditions in ways that are consistent with cultural integrity, have a sense that they are valued by their community for their contributions and will feel justified and emboldened to assume roles of leadership in confronting external forces that threaten their unique way of life. They will understand that they are the critical generation for the survivance of their unique culture in unprecedented and dangerous times, and that there is power in self-determination that overcomes the victimization and exploitation of state imposed policies that rely on a population that is uninformed, fractionated, dispersed and incoherent. Generational continuity of language, cultural customs, and traditions is the strongest deterrent to absorption within the mainstream social and economic paradigms that are based on materialism and mass consumption.

When youth are actively engaged in learning from their elders, adapting their ancestral teachings about the essential elements of survival to new challenges in unprecedented times, and creating the framework of resilience which future generations

can build upon to carry on and represent their language and culture into the future, and when they are actively caring for and maintaining the integrity of their lands and waters, the combined qualities and characteristics of health and strength in the people and the natural world are physically and spiritually positioned to resist and challenge those forces that would wrest the natural resources from those who have maintained them for countless generations. Survivance of Indigenous peoples, and the cultures and languages they maintain, depends upon the active involvement and engagement of their youth. Indigenous Youth Cooperative seeks to create a sustainable mechanism by which Indigenous youth can concentrate their energies on the survivance of their unique cultures. It requires learning about and adapting the most beneficial aspects of modern social and technological trends with the wise care and sustainable use of natural resources which are the distinctive features of Indigenous existence.

Through active involvement of young people in cultural survivance, adult elders benefit, psychically and spiritually, from knowing that their culture will have a stronger possibility of being faithfully carried forward to future generations. The community's children benefit from having positive cultural role models, teachers and leaders in their near-peers. Young people themselves benefit from having a stronger sense of purpose and accomplishment, and from the sense of satisfaction that comes from learning and preserving ancestral cultural practices and knowledge. The community benefits from gaining a stronger sense of identity which can exert itself forcefully in the face of external challenges. Lands and waters, and their non-human inhabitants benefit from revitalized, fortified, and nurtured relationships with their human protectors. The world benefits from the maintenance of cultural diversity, which strengthens the survivance

potential of all its inhabitants. Future generations benefit from the demonstration that strength and resilience is unity, and unity is diversity.

Imagine

When a young person wakes up today, what are his or her options? Some will know that they would like to stay home, or close to it, so they may play a part in the life of the community. Some will get up after their alarm, followed by leaving home and traveling away to work. Some will not have a job and will lie in bed wondering.

What if, instead, she were to rise, fulfill her morning familial responsibilities, walk down the road to a newish building with a greenhouse, greet the children nearby, and enter the building to find a large, well-lit, high ceilinged space, desks about and shelves with books and equipment, two colleagues are working at computers, one of them is speaking with someone else far away through the ether, a third and fourth are working at a table arranging equipment.

Greetings are exchanged, then a conference to determine and confirm duties for the day, update on short term objectives, coordinated tasks, and progress reports. The financial report indicates they are safe to stay the course, so everyone's projects are on track and new ones are being thought of. They gather in the studio to witness the latest community bulletin broadcasted, then one by one they drift off to do their work. One goes to collect hazardous chemicals from homes, one to do some observations above the increasing biodiversity around the beaver dams, one over to housing to talk about fitting buildings with solar, one to meet with inter-agency officials concerning catastrophic fire modeling, suppression and mitigation strategies, and one to go ask his grandfather about bringing his friends to sit around the Sim Table and tell some stories about the changes

they have witnessed in their decades. Another is away at a conference on Indigenous Food Sovereignty, learning about coordinated efforts to keep tribal communities free of genetically modified organisms. Another is attending a training on the building and utilization of drones for conservation purposes. Yet another is still sleeping, having stayed up all night to observe wildlife at the boundary between the *bosque* restoration zone and the agricultural fields.

Task assignment is interest driven, mutually agreed and overlapping so all learn at least something about the implementation of projects and shared responsibilities. Hours are flexible to accommodate the requirements that community and religious duties entail. All decisions impacting the mission and operations are arrived at through a deliberative democratic process. Monetary decisions, including wage determinations, allocation of program resources and surpluses, are committed through a participatory budgeting process. Regular internet conferencing with Indigenous Youth Cooperative offices in other indigenous communities allows for sharing of best practices, consultations regarding methodologies, and rapid dissemination of innovations.

At least once a year, all Indigenous Youth Cooperative personnel from all offices meet for a week to build relationships, report findings, and address concerns. Ethical strategies and tactics are discussed with respect to challenging encroachment, resource poaching, and pollution on lands and waters within Indigenous Domains. Budgets are presented and deliberated. Expansion of Indigenous Youth Cooperative operations to include other candidate Indigenous Domains is considered and voted on. Personnel are addressed by representatives and experts from environmental NGO's, the United Nations, government and industry. Inter-office task forces are organized to further the Indigenous

Youth Cooperative Cultural Survivance Bank, and the Indigenous Youth Cooperative Music Challenge.

Upon return from the Indigenous Youth Cooperative conference, workers refine duties and tasks, new relationships are concretized, and programs are adjusted to reflect advances in problem identification and aspirational planning. The whole team meets with the Tribal leadership to report on project progress, and discuss further efforts to affect rapid community energy efficiency transformation, and transitioning to healthful practices.

Context

The gainful employment of youth in the service of community may not have been necessary when youth grew up side by side with adults, learning skills, language, and practicing culture. Today, external forces fracture culture, currents of continuity become fragile, language suffers, webs of relationships weaken, affecting all of the inhabitants of the air, lands and waters.

When youth are given the opportunity and support to wholeheartedly accept responsibility there is very little they cannot accomplish, but they cannot fulfill it without the help of elders. When young people grow up seeing their older brothers, sisters, aunties, uncles, cousins, friends productively engaged in healing, protecting, preserving, preparing their communities, lands and waters - activities connecting the youngest with the eldest that are good, true, right, and beautiful - they will want to help. When community makes its own energy, grows its own food, caring for lands, waters, relatives, it is healthier, more resilient, better able to weather the weather.

The context of Climate Change is different. It means change, and it directly affects survivance. It calls upon all to act, regardless of the degree of colonization, to act to preserve the lands and waters for future generations. Acting *proactively* to adapt to, and mitigate the effects of, climate change is an act, a position of power, claiming the authority to respectfully and responsibly respond to the reactions of Mother Nature to damaging, harmful human practices. By praxis sensitive to the holistic respectful considerations of *Indigenous Knowledge Systems* towards nonhumans in the environment, and informed by leading edge progress in the use of emerging technologies, young people can reverse the loss of caring that is the result of generational exposure to Euro-American social and economic currents and begin to heal the generational gap in the continuity of culture from elders to future generations, and strengthen the “explicit cultural support for a symmetrical relation between humans and other animals.” (Bang et. al, 2007, 13869).

This seizing of initiative and claiming of the locus of power and action has the potential to redefine relationships between indigenous peoples and the states of governance they are within.

Sometimes there is a feeling of powerlessness that comes with becoming informed of the degree to which conditions have worsened. This has been called “well-informed futility syndrome,” (Steingraber⁴, xvi) and the implication is that since things are so bad, there is nothing that can be done. Youth have expressed this sentiment, but when they have been shown how to take actions that can make a difference, or once they learn about actions others are taking that make a difference, they are inspired to take action themselves⁵. It is inherent in the praxis of Indigenous Youth Cooperative that

young people will challenge and refute this syndrome with their own *well-informed action consciousness*. When actions are good, true, right, beautiful, and culturally integrated, self-esteem of involved youth has a positive and infectious effect on community self-esteem.

Conclusion

Youth that live in community, work in community, heal community. There can be little doubt that a majority of the world's unemployed youth would love to work close to a peaceful home, because of familial relationships, and the place based learning context that learning and practicing language and culture requires. But for reasons of power and control, humanity has not popularized a way to accommodate great diversity, and instead the dominating sociopoliticoeconochorous has determined that we shall all buy into the homogeneous, boring, and dangerous.

The ways that youth can revitalize community, in concert with all other generations, involve collective expressions of warm hearted creativity. All that is needed is time, love, and support. But the money economy has determined that no other currency will be legal tender. True tender has no life threatening conditions attached. Instead there is the participatory organizational wildfire of acting young people cleaning, protecting, preserving, and generating the parts of survivance, with the time, love and support to continue. Water, Earth, Fire and Air combine with youthful foresight perspective and energetic action to grow solutions based in the envisioned prospect of a healthy future for all.

All natural systems thrive when diversity is rich. With youth, the importance of diversity is more evident. Individual gifts, talents, and qualities of genius, guided by

spirituality, are the currency of survivance. Yet currently dominant forces expend great energy to homogenize diversity with the illusion of plenty, the false perception that the ability to choose and buy products from a bewildering array provided by competing corporate industries constitutes a full life. I say this is really the Myth of Plenty, and in reality is plenty of empty. A community that values and encourages the plurality of youth raises youth who feel connected to the transmittance of culture. Songs and dances that reify and respect cycles of time and elements, express reverence for the support of other species, verify the multiplicity of a unified reality and the concerted effort of survivance.

Perhaps a dream of indigenous peoples is to return to the kind of lives they experienced prior to the brutal intrusions and disrupting effects of colonization by Euro-American 'civilization'. Perhaps the indigenous peoples, rooted to place, are eager to part with the accumulated harms and insults, experienced through the widespread oppressions of traditional life ways, and the forced impositions of foreign customs and codes, and instead desire a return to the values and customs of ancient generations, in which relationships with the natural environment and its co-inhabitants were sensical and sensitive, derived over centuries of observation and interaction. Youth engagement intersects multiple arenas of action. Spiritual leadership desires community health and for youth to be whole-heartedly engaged in community survivance. In between ceremonies, songs and dances, active engagement with surrounding nature through observation and attention strengthens the heart with which they are performed and sung.

CHAPTER 3

POLICY BRIEF - INDIGENOUS YOUTH COOPERATIVE – AN INDIGENOUS YOUTH EDUCATION-EMPLOYMENT INITIATIVE

Indigenous Youth Cooperative Executive Summary

The Problem(s)

There are many smart, talented, and capable Pueblo young people:

- who have been to high school, but who don't know what they would do if they went to college
- who would like to stay living and participating in their communities
- who have to leave their community if they want to work to earn money
- and who, if they could, would like to have a job in their community helping their community.

Climate change presents impacts and challenges, as well as opportunities.

- animals, plants, farming, and hunting suffer because of different moisture patterns and amounts
- more intense rains wash soil away, cause floods, and muddy streams
- dry forests burn more easily and intensely, springs are drying up

Opportunity

- Community young people can provide many of the services communities need to protect, preserve, and improve their lands and waters.

- By helping their communities protect water sources, animal and plant habitat, farmlands, and become more energy self-sufficient, young people can help their communities prepare for the effects of climate change, and help strengthen their tribe's self-determination and sovereignty.

Solution

An education / training business that employs community young people to provide needed environmental, energy, and other services

Benefits

- Community young people get training and experience that will help them develop their talents, skills and interests, while being gainfully employed, allowing them to live and work in their communities.
- Lands, waters, animals and plants benefit from being more actively cared for⁶.
- All community members benefit from a healthy environment and having their young people working and helping at home.
- Community youth who participate for two years will have a better idea of what they're interested in and be better qualified for further education if they want to pursue it.

Steps

- Consent and permission to create a youth owned and operated business in the community that will provide needed community environmental and energy services is requested from Leadership.

- Community is informed about the proposal.
- Location is determined and community youth participants are recruited.

Introduction

This policy proposal addresses threats to the existence of Pueblo culture. The loss from the communities of young people who must leave to get outside work and outside education, and the increasing pressures on the lands, waters and wildlife from changing climate and outside population growth, present two significant challenges to Pueblo communities and their ability to continue their traditional way of life into the future. These challenges affect language use and cultural practice, and relationships with the lands, waters, and wildlife. This policy proposal offers a solution that can have a positive impact on community youth, other community members, and relationships with neighbors, while at the same time helping to preserve, protect, and restore the lands, waters and wildlife within the reservations and in the connecting watersheds and culturally significant lands and waters.⁷

By providing training and gainful employment for some of the community's youth, the youth are able to develop their abilities while beginning new work, and supporting existing work, that helps their community: achieve water, food, and energy security; protect and restore lands, waters, and biodiversity; and initiate and support measures to address and adapt to the impacts of climate change and climate variation.

There are Pueblo high school graduates who are talented and capable, who want to remain in their communities to participate and help in community life, but who do not have local employment options. Many also do not have clear career goals. As a result, they either pursue college in order to improve their employment prospects, or they seek

employment outside the community, often moving away, draining the community of youthful energy and talent.

There are many tasks that need to be done to effectively reduce the impacts of climate changes in the reservations and important ancestral lands that other community members, offices, and departments may not have the time, personnel, or funding to accomplish. This is a proposal to pueblo community members and leadership to allow the creation of a unique business enterprise in the community that will educate, train and employ some of these talented young high school graduates to provide these needed services in support of, and in addition to, work being done by other community members.

Organization

The organizational structure of Indigenous Youth Cooperative allows the youth personnel to receive education and training in topics and technologies that support the unique and valuable cultural knowledge of their communities, while learning from and working in support of other community members. The youth personnel are co-owners of the enterprise, and participate in all aspects of planning and decision making that affects function and operations. They have the ability to organize and prioritize their work in cooperation with other community members, offices, and departments, and support the work that other community members are trying to accomplish, while at the same time have the ability to initiate and sustain other services that are needed but for which there is currently no personnel or funding.

In order to maximize effectiveness and exchange of talent and ideas the enterprise will begin in three Pueblo communities and, once methods, operations, and benefits become established, spread to other interested communities. A comprehensive, expanding

website with secure proprietary access, which allows for reference to overall organizational information, projects, calendars, contacts, methodologies, technologies, resources, vendors, and coordination of activities, exists to facilitate operations.

Funding

Initial funding support to get the enterprise started, and to support its development until it is self-sustaining with the revenue it generates, will be sought from a mixture of sources, including non-governmental organizations and foundations, private donors, government agencies, the United Nations, and the participating Pueblo tribes themselves.

The appeal of Indigenous Youth Cooperative on multiple levels will make this possible. It is:

- a youth-employment program, it is
- an educational/skill development initiative, it
- supports environmental conservation goals, including reduction of the community's environmental footprint, it
- strengthens culture through intergenerational transmission of knowledge, language transmission, and community health, it
- helps youth participants gain experience that can help them find out what career development they want to pursue makes them better qualified for further education, and it
- strengthens the community's self-determination by improving food, water, and energy security.

Indigenous Youth Cooperative will generate revenue through contracting services where appropriate, and through the creation of an [Indigenous Youth Cooperative Music Challenge], which challenges musicians anywhere in the world, of any age, gender, culture, or musical genre, to create and submit original music for download by donation. Musicians earn royalties, and Indigenous Youth Cooperative receives funding.

Scope of Services

The youth participants of the enterprise will provide services that can be organized into the following areas of focus, with specific examples:

Water (Water Security)

- assist watershed and wildlife assessment, planning, and management efforts
- assist identification and reduction of water pollution sources
- reducing water waste and improving water efficiency

Earth (Food Security)

- farmer and farmland support
- soil conservation and erosion control
- greenhouse technology development

Fire (Energy Security)

- energy use costs/benefits analysis
- implement energy conservation and efficiency technologies
- evaluate and apply appropriate alternative energy technologies

Air (Air Quality and Communications)

- identify and reduce air pollution sources

- facilitate community communications, knowledge transmission and language practice
- provide communications technology support services

Health

- assist health care providers to identify health risks and problems and supplement health education and awareness services
- develop community toxic chemical inventory and develop a database and clearinghouse for healthy chemical alternatives

With leadership and community support to begin the process of recruitment of youth and program development, Pueblos that wish to participate can identify a location where program services can be headquartered. Depending on raised initial funding, this may mean an existing facility, or a space where a facility can be built, including offices, workshop, storage, and greenhouse.

A business enterprise that employs Pueblo youth who want to stay in their communities and contribute to helping protect, preserve, and promote healthy lands, waters and wildlife, while strengthening community and cultural relationships, will help to ensure that the culture endures the challenges of climate change and that the culture and language are successfully passed on from elders to future generations. The young people will gain skills and experience that will help them decide on their future actions.

ENDNOTES

¹ In the context of this chapter, “community” refers to an indigenous population, which could be a “tribe”, “first nation” or other designation for people who are related through many centuries of attachment and survival to a specific geographical location. (8)

² Indigenous Youth Cooperative is the working name until a unique and appropriate replacement is found.

³ A growing trend in new business development that empowers employees with decision-making power: <http://www.democracyatwork.info> (40)

⁴ Sandra Steingraber, called by some the ‘new Rachel Carson’ has written of the effects of too much negative information, and has revived this term used originally by American Psychologist Gerhart Wiebe in 1973, to describe the feelings he observed among people who had been exposed to so much information about the death and destruction of the Viet Nam War.

⁵ Personal observations of teenage Native American students, and evidence from youth action organizations worldwide, such as the “Commonwealth Plan of Action for Youth Empowerment 2007-2015”.

⁶ Services provided are not in competition with, but add to services already being provided (by other community members, offices, and departments).

⁷ I am grateful to the W. K. Kellogg Foundation for their support of the Pueblo Doctoral Cohort, and for their continued work to enhance the health and vitality of young people.

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APPENDIX A

C4P3

Comprehensive Community Climate Change Profile, Prospectus and Praxis

Community -Supportive Priority	Indigenous Youth Cooperative Activities	Research / Data Implications	Impacts
Water Water Security	assess baseline home and community water use	Ql. Qnt. GIS	[KG] [CB]
	reduce water waste, improve efficiency		[EI] [KG] [CB]
	identify, assess, project, and ameliorate contamination	Ql. Qnt. GIS	[EI] [KG] [CB]
	plan and implement sustainable solutions and economical alternative scenarios	GIS	[KG]
	assess habitats, assay biodiversity	Ql. Qnt. GIS	[EI] [KG] [CB]
	assess, plan, manage watershed natural attributes and human impacts	Ql. Qnt.	[EI] [KG] [CB]
	prioritize problems; implement stakeholder-unifying, economically viable solution measures		[EI] [KG] [CB]
	monitor water rights, law, policy, and legislative action		[KG] [CB]
Earth Food Security	research and document agricultural practices, technologies, economics	Ql. Qnt.	[KG] [CB]
	evaluate and model current and potential agricultural production, practices and problems	Ql. Qnt.	[KG] [CB]
	inventory arable lands, irrigation	Ql. Qnt. GIS	[KG] [CB]
	assess, mitigate and control erosion	Ql. Qnt. GIS	[EI] [KG] [CB]
	conserve, condition and build soil; research and experiment with soil technology	Ql. Qnt.	[EI] [KG] [CB]
	research and implement energy and water-efficient, season-extending greenhouse technology	Ql. Qnt.	[EI] [KG] [CB]
	provide physical, technical and clerical assistance for farmers	GIS	[EI] [KG] [CB]
	catalogue, protect, preserve, track, distribute community and culturally significant seeds	Ql. Qnt. GIS	[KG] [CB]
Fire Energy Security	audit, with community participation, household, neighborhood, and community energy use	Ql. Qnt.	[KG] [CB]
	analyze, model, extrapolate and project energy costs / benefits	Ql. Qnt.	[KG] [CB]
	implement and adjust energy conservation and efficiency technologies	Ql. Qnt.	[EI] [KG] [CB]
	evaluate alternative energy resources and apply appropriate technologies	Ql. Qnt.	[EI] [KG] [CB]
	promote cultural, institutional, and personal conservation practices		[EI] [CB]

Comprehensive Community Climate Change Profile, Prospectus and Praxis

<i>Air</i> Communications	assess and improve air quality (e.g. wood burning stoves in homes / asthma epidemiology)	Ql. Qnt. GIS	[EI] [KG] [CB]
	carry out 'radio' / streaming community communications teaching and learning projects		[CB]
	promote intergenerational and community integrative culture transmission, interviews, IKS promotion, language		[KG] [CB]
	facilitate comprehensive household / neighborhood modeling for water and energy 'footprint' reduction	Ql. Qnt.	[KG] [CB]
	raise awareness of, promote participation with, disseminate results of Indigenous Youth Cooperative projects		[CB]
	produce educational and community supportive Public Service messages		[CB]
	cover current events, political events, venues and special appearances		[CB]
	provide website development and communications technology support services, and other data services	Ql. Qnt.	[KG] [CB]
<i>Health</i>	conduct community composite modeling of health risks and issues	Ql. Qnt. GIS	[KG] [CB]
	develop community toxic chemical inventory	Ql. Qnt. GIS	[EI] [KG] [CB]
	develop a database and clearinghouse for healthy chemical alternatives	Ql. Qnt. GIS	[EI] [KG] [CB]
	conduct health problem and solution research	Ql. Qnt. GIS	[KG]
	identify economical, efficient, intergenerational, and culturally sensitive health-building measures	Ql. Qnt.	[KG]
	supplement health education and awareness services		[KG] [CB]
	elucidate relationship between healthy environment and individual and community health		
	assist health providers		[CB]

Table 1: The table presents more examples of community-supportive activities for development by Indigenous Youth Cooperative personnel, their research and data implications, and their potential impacts: Ql. – Qualitative research; Qnt. – Quantitative research; GIS – Geographical Information System data management; [EI] – on the ground Environmental Impacts; [KG] – Knowledge Generation; [CB] – direct and indirect Community Benefits.

APPENDIX B
LITERATURE SEARCH

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