APPALACHIAN TRANSITION INITIATIVE/APPALACHIAN PROSPERITY PROJECT
A CLEAN GLASS OF WATER FOR EVERY APPALACHIAN CHILD

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This paper proposes a project which would combine environmental remediation and civil engagement based on a promise to provide "a clean glass of water for every Appalachian child." This would require a long- term project to recover and maintain water resources throughout the region. It would involve organizing by watersheds and require cooperation between counties and states within the watersheds and involvement of many state and federal agencies, public schools and universities, businesses, industries, farms, many scientists and interest groups such as ecologists, hydrologists, conservationists and environmental citizen groups. It would involve participatory research, educational programs, cultural surveys, programs which would include ecological training, local history, work teams to clean up rivers, lakes, inspection teams and study groups, developing watershed laboratories and research facilities. Artists, musicians, oral historians, photographers would be involved in cultural research, organizing and community development. Political action would be required to develop regulations to control pollution and recover, conserve and protect the water resources of the region. The project would help coordinate the work of many agencies and community groups throughout the region working to stop environmental degradation and devastation from mining practices, timbering, tourist development, polluting industries and agricultural practices. It would combine cultural, social, natural, ecological aspects of the problem and involve a mix of business, industry and job opportunities with education, recreation and community building.

This project will be organized by headwaters rather than the usual political districts or economic development districts in order to focus on the natural ecological order and environmental problems. Water resources are organized into watersheds based on topography which makes watersheds

important natural resource management units. Other forms of organization by political, social, economic factors ignore the natural units based on topography. Decisions based on these other factors can diminish water resources, stream health, and water quality by development that exploits and devastates rather than protects the quality of water and healthy streams and enables community sustainable development.

BACKGROUND

Water is the most essential and important resource providing life and survival on the planet earth. It is essential that water resources be protected and restored. The health and wellbeing of mountain communities depend on clean water. Any plans for sustainable development for the Appalachian region require adequate, reliable and clean water resources. The loss of water resources and shortage of clean water in Central Appalachia not only affect Appalachia but adjoining states served by the watersheds in the Appalachian Mountains.

Appalachia contains the headwaters of many important rivers and streams that supply water to much of the eastern seaboard. The headwater streams deliver clean water to larger rivers, the Rappahannock, the Potomac and the Susquehanna and Monongahela and thus to millions of people in the East. Other headwater streams flow south to the Gulf of Mexico and west into the Mississippi from the New River, Kanawha, Ohio, and Cumberland, Tennessee.

> Appalachia is also the location of the greatest deciduous forests, which were the scene of massive deforestation due to clear cutting of the virgin timber early in the century. In her recent book, Shirley Stewart Burns (2007) describes some of the problems created by the industrialization of the region, timbering and the extraction of coal:

"At the onset of the nineteenth century much of Appalachia had yet to be explored, and the forests were thick and dense. From 1880 through 1920 an industrial transition occurred which was accompanied by widespread environmental destruction. Two thirds of West Virginia was covered by virgin forest; by 1920 it was gone, lost to timbering. Particularly harmful was the industrial railroad logging that cleared thousands of acres of forests. This timber boom lasted less than four decades, but the soil erosion, fires and flooding that accompanied it persisted for several decades. The changes that came with this economic shift did more damage to the mountains in thirty years than any that had occurred did the past" (p. 118).

Loss of forest resulted in loss of water storage capacity and resulted in great changes in the water sources and massive floods throughout the region. Streams that were once large became small and the land lost the capacity to hold water. Burns reminds us (p.143) that nearly 90 years ago the federal government intervened to reforest West Virginia's mountains following deforestation and the soil erosion that threatened important waterway transport systems. The government had an overt, vested interest in protecting West Virginia's waterways. Burns urges another massive reclamation project to restore the region from the devastation of coal mining: "Today southern West Virginia coalfields need a similar reprieve" (p.208).

The next big industrialization of the area by coal mining produced pollution and damage to water sources in the coalfields. With the increase of strip mining in the 1950s people in Central Appalachia have been dealing with loss of water sources: first springs and wells went dry, or became polluted and families hauled water in plastic jugs for drinking (e.g. the Hurricane area in Wise County Virginia). The more recent Mountain Top Removal mining destroys headwater streams, which presents major problem for the restoration of water resources in Central Appalachia. Coal companies have been allowed to use the valleys as dumping ground for the

overburden. From 1985 through 2001 four states most impacted -- Kentucky, West Virginia, Virginia, and Tennessee -- saw a total of 83,797 acres of land covered by 6,697 valley fills. In Central Appalachia, 438,472 acres of watershed were impacted by valley fills (EPA, 2005).

By covering hundreds of miles of streams, including intermittent and perennial streams, these valley fills have altered and destroyed stream ecosystems. Any life that cannot acclimate to life deep in a rubble pile is eliminated. In April 2003, 85 aquatic scientists from more than 40 states submitted a letter to EPA regarding changes to the Clean Water Act that would result in loss of small streams and allow valley fills to cover intermittent streams. The scientists went onto state: "Leaving no outlet for the replenishment of the water supply leads to further loss and degradation of the safer systems to the detriment of the physical, chemical and biotic integrity of ecosystems downstream….and degrade rather than maintain and improve the quality of US waters ….ephemeral, intermittent and small headwater streams should remain under the jurisdiction of the Clean Water Act" (Burns, 2007, p.126).

It is estimated that Mountain Top Removal has buried nearly 2,000 miles of streams. The number of Appalachian streams lost due to MTR does not include the ephemeral streams that flow sporadically throughout the year. Even where inaccessible to fish, these small streams provide high levels of water quality and quantity, sediment control, nutrients and wood debris for downstream reaches of the watersheds (Burns, 2007, p.128-9). Valley fills are waste disposal projects so enormous that, rather than the stream assimilating the waste, the waste assimilates the stream. Because there is no stream, there is no water quality and the loss of intermittent streams causes the rivers of Appalachia to die. Mountain Top Removal mining in the coal regions of West Virginia, Virginia and Kentucky and Tennessee not only destroys water sources for local communities but threatens the water sources of neighboring states.

Another major source of damage from coal mining is caused by slurry impoundments. Slurry is the thick gooey substance produced when coal is washed and processed. It is stored in impoundments that may hold over 8 billion gallons of slurry containing the impurities and wastewater left over from the washing. Impoundments have broken. One such failure in Buffalo Creek killed 127 people, destroyed communities and left 4,000 people homeless. West Virginia has more than 100 similar impoundments (Burns, 2007, p.135). A recent spill of 300 million gallons of slurry in Martin County, Kentucky affected 75 miles of streams and reached the Tug River and the Big Sandy (Burns, 2007, p.135). Impoundments at coal generating facilities also endanger water sources and communities (e.g. a recent Tennessee spill from a TVA coal generating facility). Coal slurry pumped into old underground mines has polluted the aquifers in Boone County, West Virginia.

As Burns writes (p. 143), "energy from coal has kept America running… while America prospered with each ton of coal consumed, little attention has been paid to the region and its people –it is time to pay them back." In order to affect change citizens must push for reform and politicians must support policies to diversify the economy of the coal fields. Mountain Top Removal has caused irreparable harm to the environment, the culture, and the people of West Virginia. Coalfield communities will dry up completely. Grasslands and moonscapes and ghost towns replace hardwood forests, wilderness, mountain streams ---West Virginia coalfield communities, the people and land will be as gone as the last ton of coal scraped out of the mountains themselves" (Burns, 2007, p.143).

Other water problems have occurred when coal companies closed and left town. The water systems owned and operated by coal companies became derelict and communities had to organize to develop new water systems (e.g. Coretta in McDowell County, West Virginia). Other more recent water problems in other parts of Appalachia have emerged as companies have developed bottle water producing facilities that deplete the water sources from the mountain homes in the neighborhood. New water

problems have developed when corporations have bought the water systems in some communities and raised the prices so high that low income families are no longer able to pay their water bills (Levine, 2009).

Other polluting industries (paper mills, chemicals, tanneries) in the region have poisoned the streams and water sources for both animals and humans living on the streams (e.g. Pigeon River and Yellow Creek in Tennessee; Holston Rive in Virginia and Tennessee.; Kanawha in West Virginia). Carcinogens have been found in tap water and unsafe chemicals in drinking water from wells (Duhigg, 2009). Recent droughts from global warming have put pressure on lakes and streams providing water for families and food production as well as recreational facilities and commercial enterprises. Droughts have resulted in severe shortages and competition and conflict between states over water rights (e.g. Tennessee, Georgia and Florida)

The water sources throughout Appalachia have been badly abused, used as garbage dumps, sewage systems, and waste disposal sites and recklessly exploited for recreation, energy production, industrial development, transportation routes and bottle water sales. They have been damaged by landscaping for home development, urban development and road building. They have been over used to water golf courses, lawns, irrigation farming and recreational water parks. Modern lifestyles and urban living have alienated people from nature, from the sources of their water. When they turn on the faucet and water comes out, few know or check out the source. One step in the recovery and protection of our water sources will be education and reeducation of everyone not only as to the source of their water but also the importance of water to their health and well being, and ways to protect and restore this resource. School curricular development, adult education programs and public policy development are needed to bring about this reeducation, awareness and civic engagement to restore water resources.

OPPORTUNITIES

National and international concern for climate change has provided an opening for programs designed to deal with environmental crises. The current Administration has expressed concern about environmental problems and is open to programs that will restore and protect the water resources. The Environmental Protection Agency recently began issuing grants for environmental education projects "that enhance the public's awareness, knowledge, and skills to help people make informed decisions that affect environmental quality." The National Science Foundation, National Academy of Science and other agencies have resources and interest in conserving ecosystems.

There are a growing number of community groups concerned with environmental problems. Many of them concentrate on river systems: river watchers, river clean- up groups, etc. National environmental groups have joined with Appalachian community groups to fight mountain top removal and to work with organizations to preserve rivers and streams from pollution and devastation. Among them are: Nature Conservancy, Environmental Defense Fund, Sierra Club and Summer Justice Student groups.

Some colleges and universities have developed environmental studies programs and joined with community groups and regional and national environmental groups in researching water quality of streams and rivers, studying salamanders, fresh water mussels, and other indicators of stream health. They train and work with community groups to monitor water quality (e.g. Virginia Tech and Clinch River group, Carson Newman and Holston River in Tn.)

With an administration more welcoming to resource conservation and the emphasis on climate change this is a good time to seize the opportunity. Many colleges and research agencies have studies and facilities available and ready for implementation of projects. One opportunity is to help coordinate the work of agencies, organizations and individuals to deal with the problem. Many research projects from

universities and government agencies have been limited in scope to single streams or habitats or to an immediate crisis. Many recommendations resulting from the research have been ignored. Broader research is needed to cover the region and much of it could be combined with community education including participatory research in each watershed. With community involvement, policy change not only is possible and is necessary to implement change in water use and conservation. This would require integrated public education and participation by watershed areas. This could be facilitated through cultural programs that include local history of the watershed, oral histories and documentation of changes in the communities. The goal to make the region's economy more diverse, robust and sustainable depends on protecting and conserving the water resources and democratic participation in that process.

THE PROPOSED PROJECT

I proposed a project called "To Provide Every Child a Clean Glass of Water". It would involve organizing research, education and action by watersheds. A Watershed Center would be established or designated from existing facilities for each watershed in the region. This would include facilities for communities to test water quality of home wells, springs, streams, rivers -- all water sources. Participation could begin with everyone testing their water and understanding its source.

Each Watershed Center would also be an education center, research center and training center for restoration and other work groups. If facilities already exist in the area for these purposes the project could be combined with their programs. The Centers must be open to the public and include education and participation as central to their work. A survey and mapping project would be developed to assess the water quality of each watershed. The major rivers and streams in each watershed would be the subject of a history program. In addition to technical data, oral histories would be developed based on,

archival research of land deeds and other records to discover who has lived on the river and what changes have occurred in the watershed. This would also include a pictorial history with photographs and mapping of the current state of the river. Much of the research should be participatory, involving community members. Community study groups should be organized to assist with the research, mapping, surveying and monitoring. Combined, this will provide contextual environmental history.

The Centers would organize classes to train river monitors and develop ongoing monitoring programs. If there is a community college or university in the area, it could include this in a class on the local environment. If there are water keepers or river keepers in the area they can do training and monitoring and should be involved. The public schools should be involved in the project and curricula developed for both elementary and high schools to study, map, monitor and assess the water quality of the area and study the flora and fauna, the mussels, salamanders, fish and other wildlife of the river area. Field trips could be arranged to find the headwaters source and trace the history of changes.

There are several university environmental programs and community environmental groups that have developed excellent curricula for such work. Work teams in communities and schools could be organized to clean up river, lakes, and streams. If such groups as River Watchers and clean up groups already exist, they should be recruited early to help organize such activities and learning experiences. Youth Conservation or environmental groups could be organized in all watersheds.

Nearby universities or colleges should be encouraged to offer classes both for their own students and for teachers in public schools. Their scientists in water and soil sciences, toxicology, hydrology, and associated ecological and environmental studies should be recruited to participate. As the project progresses, pollution problems are identified and action is proposed, other scientists and technicians will be needed such as those from agricultural and conservation agencies who can teach ecologically

healthy methods of farming, water purification , soil management, composting, recycling, sustainable methods of living on the land and protecting the water.

Water systems should be assessed for quality. Technical and management help should be provided to improve or replace unsafe or unhealthy systems. The sewage systems of each community or water district should be assessed and technical assistance given to correct any problems. All straight pipe sewage from residences into streams should be eliminated and help provided to develop alternative and ecologically safe systems. Old or improperly working septic systems should be replaced and alternative systems provided where feasible. Consultants, technicians and workers should be recruited to give assistance to home and business owners who need to replace unhealthy or polluting systems. Animal waste entering the water from farm pastures or food-producing poultry or hog farms should be eliminated. Technical and regulatory assistance will be needed to create just and workable solutions.

Tourism, second home and recreational development in the region coupled with unsustainable forest management practices have resulted in loss of vegetation and pose big threats to the freshwater and drinking water for scores of people downstream. Land and forest management programs need to be improved or developed.

To clean up all pollution and to stop pollution from mining, coal-fired power plants or chemical industries, policy and regulatory changes will be required, both local and national. Citizen groups can partner with university and research centers for help documenting the damage and fighting for clean water and clean air, including regulation of acid rain and other airborne pollutants that result in water pollution. Organizing the various groups into a coordinated regional movement to lobby for regulation restoration and reclamation may require help of community organizers, lawyers and local representatives to both state and federal government. There are groups in the region already doing

some of the proposed education in various places; this project can serve to bring them together, coordinate their work and provide information and help to empower citizens. This project would serve as an umbrella group to exchange ideas, experiences and people and promote policies for restoration, conservation and ecologically sustainable community development.

The challenges confronting the Appalachian communities and watersheds are immense. Restoring them will require years of sustained effort to provide clean water for every child. Even though three quarters of the earth is covered by water, the percentage of freshwater that is available for everyday human use is very small. Clean freshwater is even scarcer. To restore some watersheds will require major work projects. Models of conservation include past national projects of reforestation, the Civilian Conservation Corp's work to restore land and develop recreation facilities, WPA projects to build infrastructure, the conservation work of the Job Corp, and Agricultural Extension programs to change farming practices. Projects can provide work for the unemployed as they restore the watersheds, rebuild community water and sewage systems, change agricultural practices, rebuild communities destroyed by mining, deal with leftover pollution from mining, deal with ash and sludge from coal generating plants and help remediate damages from other industrial operations such as chemical plants, paper producing industries, tourism and transportation. The task seems overwhelming but the restoration of water resources in Central Appalachia could serve as a model for national and international recovery programs.

ECONOMIC DEVELOPMENT PRINCIPLES:

The project is basic to the overall mission of developing a sustainable economy for the Appalachian Region. It fits the following Economic Development Principles:

1. Genuine Prosperity of its people: To develop a healthy and educated populace, knowledgeable about the importance of water resources, the need to preserve and recover natural water resources, and the need to stop degradation and destruction of streams due to mining practices, timbering, tourism and industrial pollution, and the loss of water or access to bottle water companies and corporate water policies.
2. Meet the Needs of Today and Tomorrow: To recover, conserve, preserve and protect water resources is essential to healthy communities and sustainable development.
3. Sustain and Enrich Human, Natural and Cultural Capital:

To understand the water problems, the project will combine cultural, social, natural and ecological aspects. All are users of water resources and clean water is vital for all.

4. Mix of Business, Industry and Job Opportunities: To provide clean water would involve development of jobs and industries to keep and maintain good water systems, recycling, sewage systems, changing agricultural practices, cleaning up polluting industries, resources for recreational development, fishing and food production, waste disposal (hog farms, poultry plants, etc.) The educational program would involve researchers, engineers, surveyors, cultural workers, oral historians. The project requires communities to focus and act by watershed which would encourage farming, forestry, mining activities to be watershed centered and more sustainable.
5. Create Educational, Recreational, Cultural and Career Opportunities for Young People: To develop and protect watersheds and provide clean water systems would require technical education, careers in conservation, education and recreational work around restoration of water sources. Learning the history of watersheds could lead to restoration of mineral springs and development of recreational and health facilities. Cultural history and cultural preservation is community building.

6. Political and Economic Power Sharing: To develop systems of recovery and maintenance and to develop regional watershed regulations, counties and States within watersheds must cooperate. Commercial operations and agriculture must become responsive to watersheds; agencies and environmental groups must participate in developing policies and cooperative projects. Planning and development boards must work by watershed and involve environmental and community groups in programs.
7. Increase self sufficiency, health, well being, safety, dignity of people: Working to provide clean water, restoring health of water resources will improve health and well being of people. Restoring water resources and eliminating polluting and destructive mining practices would greatly improve the safety and well being of people. Programs could provide better systems of recycling, organic agriculture, local food production, small community size hydro systems, and systems for recycling house water and waste and better use of water for energy.
8. Sustainable use of Natural Resources: To guarantee clean water and restore water resources will require all producers and inhabitants to become sustainable in their operations. Thinking and acting by watersheds will require cooperative efforts of all users of the natural environment: agriculture, forestry, mining, recreation, wild life protection and stewardship instead of exploitation.
9. Economic Equity, Environmental Justice, Equal Opportunity: The right to clean water must be included in the rights of individuals and all living organism The goal is to provide clean water for all and do away with inequity.
10. Non Market Production: De-commercialize water, no corporate control or commercial control over water.

References

Burns, S. S. (2007). *Bringing Down the Mountains: The Impact of Mountaintop Removal Surface Coal Mining on Southern West Virginia Communities, 1970-2004*. Morgantown: West Virginia University Press.

Duhigg, C. (2009, September 12). Clean Water Laws Are Neglected, at a Cost in Suffering. *New York Times*.

Levine, Y. (2009, November 26). Bailed-Out AIG Forcing Poor to Choose Between Running Water and Food. *AlterNet.*

U.S. Environmental Protection Agency. (2005). *Mountaintop Mining/Valley Fills in Appalachia Final Programmatic Environmental Impact Statement. Obtained February, 8, 2010 from: http://www.epa.gov/region3/mtntop/pdf/mtm-vf_fpeis_full-document.pdf*

RESOURCES

The following is a beginning list of sources of information and help that needs to be developed and utilized. There are many resources ready for use in developing such a project.

Books:

Burns, S. S. (2007). *Bringing Down the Mountains: The Impact of Mountaintop Removal Surface Coal Mining on Southern West Virginia Communities, 1970-2004*. Morgantown: West Virginia University Press.

Davis, D. (2000). *Where there are Mountains: An Environmental History of the Southern Appalachians*. Athens: University of Georgia Press.

Eller, R. (1982). *Miners, Millhands, and Mountaineers: Industrialization of the Appalachian South 1880-1930*. Knoxville: University of Tennessee Press.

Eller, R. (2008). *Uneven Ground: Appalachia Since 1945*. Lexington: University of Kentucky Press.

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Johannsen, K., Mason, B.A., & Taylor-Hall, M. A. (2005). *Missing Mountains: We went to the Mountaintop but it Wasn't there*. Nicholsville: Wind Publications.

Kilgore, F., & Fowler Horton, S. (2007). *The Clinch River: A World Class Treasure*. St. Paul: Mountain Heritage, Inc.

Lewis, R. L. (1998). *Transforming the Appalachian Countryside: Railroads, Deforestation, and Social Change in West Virginia, 1880-1920*. Morganton: West Virginia University Press.

Reece, E. (2006). *Lost Mountain: A Year in the Vanishing Wilderness*. New York: Riverhead Books.

Shnayerson, M. (2008). *Coal River*. New York: Farrar, Straus and Giroux.

Sources for Relevant Government Documents:

West Virginia and other State Departments of Environmental Protection and the U.S. Environmental Protection Agency, U.S. Department of Energy,. U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Department of Interior, U.S. Department of Agriculture, U.S. Forest Service, National Academy of Sciences, Appalachian Regional Commission, Tennessee Valley Authority.

Community Environmental Groups and Advocacy Groups :(Kentuckians for the Commonwealth, Save Our Cumberland Mountains, Ohio Valley Environmental Coalition. Mountain Watershed Association, Riverkeepers, Coal River Mountain Watch , West Virginia Highlands Conservancy, Trial Lawyers for Public Justice. West Virginia Save our Streams, Watershed Assessment Program, Division of Water Resources West Virginia, Upper Tennessee River Roundtable, Appalachian Center for the Economy and the Environment, Southern Appalachian Mountain Stewards, The Nature Conservancy Biodiversity Hotspots Nature Conservancy Clinch River Program , Sierra Club , Mountain Justice

Watersheds in Central Appalachia: Maryland, West Virginia, Pa., Virginia, Ky, Tn. (Upper Guyandotte, New River, Clinch, Holston, Powell, Pound, Guest. Tennessee and Big Sandy, Kentucky, Cumberland, Greenbrier, Cheat, Tug River, Rappahannock, York, Monongahela, Susquehanna, Kanawha, Ohio

Colleges and Universities with environmental studies courses or research centers dealing with environment and water resources:

State College PA, Stroud Water Research Center; Coal and Energy Research Bureau. West Virginia University; Pennsylvania Department of Education Ecology and Environment; Maryland State Department of Education, Environmental Programs.

Curriculum development for Public schools:

The University of Maryland Center for Environmental Science, Frostburg, Maryland has developed materials for connecting classrooms with watershed investigations.

The Virginia Department of Education has mandated that each school child in Virginia should have a Meaningful Watershed Experience every year. Clinch River Watershed Experience-(CREW) Abingdon, Va. produced a curriculum for Scott County, Virginia. CREW works with Appalachians Tested and Reviewed, an organization designed to empower middle school, high school and college students to investigate the hydrology of the Clinch River watershed through use of the Global Learning and Observations to Benefit the Environment (GLOBE)

Virginia Naturally: Curriculum resources, Classroom grants and Student information. D.C. Department of health Watershed Protection Division (hands on environmental education).

Izaak Walton League of America has developed Save our Streams—Watershed Stewardship Action Kit, A Handbook for Stream Enhancement and Stewardship and Hands on Save Our Streams: Science Projects Guide for Students.