



2019

Rural Social Work and Environmental Justice

Pamela C. Twiss
California University of PA

Follow this and additional works at: <https://digitalcommons.murraystate.edu/crsw>



Part of the [Social Work Commons](#)

Recommended Citation

Twiss, Pamela C. (2019) "Rural Social Work and Environmental Justice," *Contemporary Rural Social Work Journal*: Vol. 11 : No. 1 , Article 11.

Available at: <https://digitalcommons.murraystate.edu/crsw/vol11/iss1/11>

This Feature Article is brought to you for free and open access by Murray State's Digital Commons. It has been accepted for inclusion in Contemporary Rural Social Work Journal by an authorized editor of Murray State's Digital Commons. For more information, please contact msu.digitalcommons@murraystate.edu.

Rural Social Work and Environmental Justice

Cover Page Footnote

The author would like to thank colleagues in the Rural Social Work Caucus for their comments on presentations I have made on this work over the years.

Rural Social Work and Environmental Justice

Pamela Twiss

California University of Pennsylvania

Abstract. While social work education and literature includes a growing body of work focused on environmental justice and the role of social work in addressing environmental injustices, limited attention has been paid to the disproportionate impact of these issues in rural areas. Many rural places can be more accurately described as *rural-industrial* in character. They produce the world's food through highly mechanized agro-businesses, its timber, and much of its fossil fuels through large mining and drilling operations, each presenting threats to the surrounding environment and local peoples. This work describes environmental issues and injustices common to select large-scale rural industries, discusses social work concerns related to these issues, and presents two case studies that can be used in social work education to promote critical thinking and social work problem solving at the individual, family, and community practice levels.

Keywords: rural social work, rural social work practice, environmental justice

Rural people and their communities differ dramatically from place to place. Places classified as “frontier” in the United States can be very different from small towns in the rural south or midwestern prairies (Davenport & Davenport, 2008; Wilger, 2016). Community life in rural villages in India can look very different from that of rural Australia. When we consider the environmental issues confronting rural communities, we also encounter great diversity. In parts of the United States and other countries, the chief environmental issues confronting rural peoples may be related to excessive heat and draught, and access to clean, drinkable water (Balazs & Ray, 2014; Harper-Dorton & Harper, 2015; Willett, 2015). In other areas, the primary environmental issues facing rural peoples are tied to industrial activity and its impact on air or water quality. The scope of potential problems is sufficiently large that it would be very difficult to adequately address in one article. For that reason, this work describes environmental issues and injustices common to select large-scale rural industries, discusses social work concerns related to these issues, and presents two case studies that can be used in social work education to promote critical thinking and social work problem solving at the individual, family and community practice levels.

Martin (2015) chronicles the history of rural-industrial workers in West Virginia, an entirely Appalachian state; the concept of “rural-industrial” also fits many other rural areas in the United States and abroad. Davenport and Davenport (2008) present Deaver's characteristics of rural places as including but not limited to “low-density settlement,” “physical distance as well as social and cultural isolation” from urban cores, and “specialization of rural economies with little diversification” (p. 537). While we may associate these characteristics with highly idealized bucolic rural landscapes, with family farms and small country stores, these characteristics make rural communities ideal places for industrial development. Large tracts of vacant land attract industries that require big parcels. Low-density population minimizes exposure of people to environmental harm. Low-density population also diminishes the procedural power and political influence of the people and their communities (political representation and relative power at the

state and federal levels being related to population size, not land mass). The powerful political influence of large corporations can readily outweigh the influence of small town and rural populations. Those representing large industries are visible in the halls of government at the state and federal level. This is illustrated in a news article on an energy lobbyist's meeting with state legislators in 2019. The lobbyist unveiled legislative priorities that would be helpful to his industry, including a call for the West Virginia legislature to issue a resolution condemning the use of lawsuits by environmental groups challenging pipeline permits (Patterson, 2019).

Physical and socio-cultural isolation from urban cores also serves to minimize the visibility of and concern for serious environmental hazards in rural areas. During education sessions on the public health impacts of oil and gas industry development the author has noted that experts comment on how fortunate it is that most of the disruptive polluting activity occurs in areas with fewer inhabitants. Simply put, rural people affected by polluting industries can be easy for the rest of society to ignore. It is understandable when rural peoples view their communities as "sacrifice zones" that exist to support urban life.

Rural areas are known for high levels of poverty, lower levels of education, isolation and lack of resources, including employment (Daley, 2015). They have more in common with poor inner-city neighborhoods than many would care to admit. These characteristics are frequently associated with persistent negative stereotypes of rural people as ignorant and backward. Consider the following terms that are associated with rural people in the United States: hick, hillbilly, country bumpkin, hayseed, yokel. None of these terms are positive. We could locate terms with similarly negative meanings in countries around the world. Being "othered" by the rest of society increases the chances that rural people will be disadvantaged and experience diminished power and respect, as well as discrimination. The icing on the cake is that their perceived "rural backwardness" can also be used to blame them when they are harmed, much like people of color in poor inner-city neighborhoods are blamed for the conditions in their neighborhoods. Outsiders, particularly the more affluent and well-educated can be quick to adopt a blaming attitude: They shouldn't have allowed their community to be polluted. What were they thinking? They shouldn't have sold the mineral rights on their farm, etc. Shame on them for their greed, etc. The basic message is the same: they are ignorant and whatever happened was their own fault.

Rural social workers have vital roles to play in working with their rural clients to address environmental injustices and to promote environmental justice in the communities they serve. As Rogge (1993) eloquently stated, "Social work educators, practitioners, and students have a compelling call to act where poverty, discrimination, and environment hazards threaten communities" (p. 112). As professionals attuned to the importance of place to rural people (Daley, 2015), they are in an ideal position to provide support and access to resources for clients when they are threatened by environmental hazards. This article provides an overview of some pressing rural-industrial environmental issues and discusses roles and interventions rural social workers can use to help rural people. It also explores what it would mean to seek and achieve environmental justice in rural areas and the national and international expectations for social workers to engage in this type of work here and abroad. Finally, two case studies are presented that offer students and practitioners the opportunity to explore how rural social work methods can be "greened" to promote environmental justice.

Contemporary Rural Environmental Threats

Rural people in rural-industrial areas face environmental threats that are intimately connected to their day-to-day lives and their economic dependence on dangerous work opportunities in agriculture, paper and pulp production, as well as extraction-based and other industries. Many of the environmental hazards they face are global in nature, affecting rural people around the world. Indigenous people, in the United States and abroad, are particularly affected (Dominelli, 2013; Shriver & Webb, 2009). In the paragraphs that follow, several major contemporary rural-industrial threats are highlighted. This is far from a comprehensive treatment of environmental issues affecting such areas. Rural social workers need to be aware that sources of pollution and environmental degradation are common and can be related to many industries, including those as seemingly benign as health care and its associated medical waste.

Agriculture and Forestry

A common use for rural land is agriculture, including forestry, and the production of crops and proteins (meats and poultry). Globally, the general trend has been away from small, family-run farms to large-scale agribusiness and concentrated animal feeding operations (Davenport & Davenport, 2008). Agricultural production has been industrialized as societies have become more urbanized. Even traditionally family-owned farms are increasingly industrialized, large-scale operations using the latest technologies and advances in the science of commercial agriculture designed to “feed the world.” These developments have produced desirable and undesirable outcomes. Desirable outcomes frequently mentioned are dramatically increased agricultural production, feeding more people on less land (Pingali, 2012; Shiva, 2014b). In 2009, the United Nation’s Food and Agriculture Organization (FAO) held a “high level expert forum” on “How to Feed the World in 2050” that anticipated that the future would require increasing reliance on a smaller number of farmers, with decreasing lands set aside for agriculture, to produce more food for more people (FAO, 2009).

On the negative side, increased production has intensified the use of fertilizers, as well as pest and weed-killers (pesticides and herbicides) (Shiva, 2014a). Large scale production of corn, grains, and other foods has been associated with specific threats to the environment, including pesticide and fertilizer run-off that can lead to ground and water contamination (Centers for Disease Control and Prevention, 2010) and pose threats to the health of farm workers similar to those experienced by other industrial workers (Occupational Safety and Health Administration, n.d.). The pesticides that farm workers handle or contact through their crop-related work can also lead to chemical exposure of their children; this has been raised as a potential community health issue (Rogge & Combs-Orme, 2003). Pesticide contamination of groundwater can be difficult or impossible to address once it has occurred (Trautmann et al., 2012). Large-scale agricultural production can expose farm workers and those nearby to other substances that affect their breathing and lungs. Farm workers, for example, can be negatively affected by what they inhale during their work (e.g., dusts, molds, and gases) (Kirkhorn & Garry, 2000).

Industrial production techniques have not been applied just to the production of grains and corn. The production of meat and poultry has also been industrialized. In the United States and other countries, animal feeding operations (AFOs) have been developed to address increased

demands for meat and poultry. Chickens, turkeys, and pigs are increasingly produced through large factory farms globally (Otte et al., 2007). In the United States, when these operations are very large and operate as industrial animal production farms, they are classified and regulated as Concentrated Animal Feeding Operations (CAFOs). Animal feeding sites and CAFOs have been recognized as sources of pollution for decades (Hribar & Schultz, 2010). The animal waste produced at these farms is frequently collected in large “lagoons” and sometimes sprayed as fertilizer. Disposal of animal waste on land can lead to contamination of wildlife, including mammals and birds (Otte et al., 2007).

The distribution of CAFOs is not even (Jacques et al., 2012). They tend to be concentrated in particular states in the United States and particular nations globally. For example, swine factory farms tend to be concentrated in Iowa and North Carolina, broiler chickens in Arkansas and Georgia, and dairy in California (Gurian-Sherman, 2008). Globally, pig and poultry operations have also become geographically concentrated, building on competitive advantages made possible as the production process becomes highly integrated (Otte et al., 2007).

The Natural Resources Defense Council (2013) and others have reported that CAFOs and their waste storage systems can give off noxious and harmful gases (e.g., hydrogen sulfide) that pollute the air we breathe and sometimes leak or overflow, sending large amounts of nitrates, drug-resistant bacteria, and microbes into groundwater and waterways. The location of polluting hog farms in close proximity to poor and nonwhite populations has been raised as an environmental justice issue (Wing et al., 2000).

The production of wood and wood products has also become highly industrialized. The cultivation and logging of forests is associated both with agriculture and with extraction-based industries (discussed in the next section of this paper). Over half of the forests in the US are privately owned and these produce most of the wood and paper; in the west, more land is held publicly (Oswalt et al., 2014). The FAO (2016) reports that most forest across the globe is publicly owned, but private management as well as private ownership rates are increasing. Globally, forests predominate in rural areas; a significant but declining proportion of forest is owned by “local, tribal, and indigenous communities” (FAO, 2016, p. 39). Illegal logging of forest in indigenous territories has been a serious problem in Brazil, and has been associated with large fires that present environmental and other threats (Wallace, 2016). Numerous publications address the importance of forested land to the world’s environment. Here we focus on environmental issues immediately experienced as a by-product of use of forests for the timber industry and for extraction-based industries (as forests are frequently clear-cut to prepare land for mining activities).

Wood processing can expose workers and those living near plants to chemicals and toxins; bleaching in paper production can be a significant source of dioxins, serious pollutants. Paper and pulp production plants are known for producing air pollutants and odors and, like mining, the timber industry historically sent waste to landfill operations (though other options are used today). In the late 1990s, the Environmental Protection Agency charged seven mills with Clean Air Act violations affecting the Chesapeake Bay area, noting that millions of pounds of sulfur dioxide, nitrogen oxides, and sulfur compounds were illegally released into the air,

producing acid rains and increased ground ozone levels (associated with breathing problems) (Environmental Protection Agency, 1999). In 2002, a Washington D.C. Circuit Court decision upheld the Environmental Protection Agency's water pollution discharge limitations for pulp and paper mills. A news article on the decision noted that implementation of the then new EPA guidelines should eliminate fish advisories resulting from dioxin contamination of waterways (U.S. Newswire, 2002). Concerns about pulp mill pollution and contamination of ground water, soil and air are global in nature with news reports on local protests, court cases, and potential mill closings coming from around the world, including Nova Scotia in North America (c.f., A. P. Worldstream, 2009; Bundale, 2019; Staff Reporter, 2007).

Agribusiness rural population environmental and community issues. The industrialization of agriculture, in all of its facets, whether we are talking about crops, meats or wood, frequently has not been a positive development for farmers, farm workers, those working in the timber industry, or their communities. While farmers have always been subject to forces beyond their control in the marketplace and dependent on good weather, their independence in choosing how and what they farm is increasingly limited. In the United States and abroad, more and more farmers have to buy from a small number of corporations specific types of seeds (that they cannot legally save and recycle), breeding stock for meat and poultry, fertilizers and pesticides. They are also pressured to invest increasing sums into the latest technologies, which frequently traps them in excessive and unsustainable debt that further limits the options they have for what they grow and raise and how they produce their goods (Hendrickson & James, 2004). A bad crop year can mean financial catastrophe. Vandana Shiva, who has written extensively about the impact of agribusiness, has documented significant numbers of suicides among highly indebted farmers facing bad crop years in India (Shiva, 2014a). While farmers have often been viewed as independent and self-reliant, they and their communities are highly dependent on external forces operating at the state and global levels.

The impact of agricultural environmental hazards can disproportionately affect minority and vulnerable populations, a social and economic justice issue. In the US, the majority of farm workers were born outside the U.S., and within that group the majority were from Mexico (National Center for Farmworker Health, 2012)¹. Economic dependence on large farm employers can be associated with diminished concerns related to environmental risk on the part of workers and decreased likelihood that they will call attention to problems (Jacques et al., 2012). The reliance on migrant or seasonal workers in many large-scale farming operations leads to the potential for disproportionate environmental risks to a transient minority population and to community issues surrounding transitional housing and community adaptation to this population. Migrant and seasonal workers often rely upon their employers for wages and housing. Living in temporary housing controlled by the employer leaves workers and families very dependent on the employer to meet all of their needs and vulnerable to poor living conditions (Arcury & Quandt, 2011; Keim-Malpass et al., 2015). These workers are increasingly employed as "guest workers" and unable to seek employment with another employer when conditions are bad. They can also experience discrimination within surrounding rural communities, particularly when they are non-English speakers (Daley, 2015). Even though their low wages effectively function as a

¹ It should be noted that these data were gathered in 2007-2009, prior to the Trump administration's implementation of border control measures.

subsidy for those purchasing the food in the broader community, they may not be welcomed by the community.

Risk of exposure to agricultural toxins in a rural community can also be associated with rural recreation. Hunting and fishing are common outdoor activities in rural areas. Rural people are known to value being able to hunt and fish and teaching their children to do so. What is caught is often an important source of protein in the family diet (Davenport & Davenport, 2008). Excess is often shared with extended family, neighbors, and co-workers; Daley (2015) notes that sharing food is an important social exchange and approach to interaction in rural places. Being in a position to share meat and fish can be a source of pride for locals. The author has been offered deer meat more than once by co-workers and family friends who had successful hunting trips. The offering of the meat comes with the story of the hunt. Unfortunately, contaminants that make their way into the ground and waterways can negatively affect the food chain. If they make their way into water, fish, and wildlife, they can affect the humans who eat them (Rogge & Combs-Orme, 2003; Shriver and Webb, 2009).

As is the case with extractive industries described below, rural areas are often hungry for any type of economic development and access to jobs. Rural people and communities are typically presented with the argument that their choices are limited to jobs OR the environment. A study of perceptions of polluting agribusiness operations found that people who have or expect to have employment in these sites typically have a more positive view of the industry (Jacques et al., 2012); workers are often willing to suffer exposure and possible health effects for access to jobs.

Major Extractive Enterprises

The large tracts of vacant land available in more rural areas are very attractive to major extractive industries. Mining and drilling for fossil fuels – particularly coal, oil and gas – dramatically affects rural communities. So does mining for metals and metallic elements, ore, and minerals. These activities have been common in the United States and abroad, but increased mechanization and new technologies have dramatically changed how mining and drilling are done and their potential impacts here and abroad. Many of us grew up hearing about America's Gold Rush and seeing images of men panning for gold. Panning has largely gone the way of the stagecoach. Today's mines are often enormous operations made possible by high-powered explosives, huge trucks and draglines, and relatively small numbers of workers.

The distribution of mining activity is very uneven. For example, coal mines in the United States are concentrated in three regions grouped by the U.S. Energy Information Administration as "Appalachia", "the interior" and "the Western region" (including the Powder River Basin crossing Wyoming and Montana). Within these areas, the top producing states in 2018 were Wyoming in the West, West Virginia in Appalachia, and Illinois in the interior (U.S. Energy Information Administration, 2019). There are very large mines in the Powder River Basin (Coal Business Unit, BNSF Railway, 2016). Rural Native Americans have experienced significant damage to their land from extractive industries (Shriver & Webb, 2009). Daley (2015) notes that places are often named for their primary industry. So it should not be a surprise that we can find coal mines in Carbon County, Utah. While the United States is known for its coal, Russia,

China, India, Australia, Colombia, Canada, and other countries have very large coal reserves, as well. Mining for metals and metallic elements also naturally occurs where those resources are located, in the United States and abroad. There are large copper mines in the western United States, in South America, and in Indonesia. Top gold producers include China, Australia, the United States, Russia, South Africa, Peru, Indonesia, and others. An examination of aerial images of the largest mines on the internet reveals that they are often in quite rural areas or on the outskirts of cities.

Mining was traditionally labor-intensive and frequently still is, though it is increasingly highly mechanized, requiring fewer and fewer workers per mining site. Mining is done in a variety of ways. Social workers serving communities affected by mining should talk to local people about the processes being used to mine. Typically if the resources are near the surface, some form of “surface mining” is done, using open-pit mining, strip mining, or mountain top removal mining. Earth and rock covering the resources (called “overburden”) are blasted off using explosives. The material blasted off is either dumped back into the mining site after the mining is completed or plowed into adjacent valleys (the method used when the tops of mountains are blown off) (Palmer et al., 2010). When resources are buried deep within the ground, miners and machines create pathways to the materials and dig or cut them out.

Mining in all of its forms has the potential for extensive damage to the environment. While the United States has national laws and regulations in place that require environmental impact studies and reclamation of mined land, and other governments are also concerned with environmental impacts, problems continue to be documented. Some of the issues are related to handling the waste produced when mining occurs. For example, in the process of washing coal, sludge is produced that is highly toxic. The sludge is often placed in containment ponds or pits that hold millions of gallons. When they leak or the containment walls break, disaster strikes. In October of 2000, in Martin County, Kentucky, an enormous coal slurry spill occurred contaminating miles of water and drinking water supplies for thousands of residents. Mining of metals and metallic elements also results in wastewater that is highly toxic. In the summer of 2015, people in the United States were reminded of this when several million gallons of toxic fluid was released as the EPA tried to remediate an old, shuttered gold mine in Colorado. In addition to the generation of large amounts of toxic waste and wastewater, mining activity can contaminate nearby fresh water sources. For example, earth and rock removed during surface mining have buried and contaminated streams when they were dumped into valleys (Bernhardt & Palmer, 2011).

Like mining, natural gas and oil drilling are common activities in the United States, with gas and oil wells in over 30 of our 50 states (Kelso, 2015). Fossil fuel drilling is also common in other countries. Ever increasing demands for energy resources and cleaner burning fuels have brought pressures to access more difficult to reach fossil fuel reserves, typically termed “tight” gas and oil. A new technology termed hydro-fracturing (commonly called “fracking”) or “unconventional drilling” is being used to horizontally drill through layers of rock to access tight pockets of oil and gas. The new technology has been associated with the development of large oil fields in North Dakota, and significant drilling in Texas, Arkansas, Louisiana, Pennsylvania, Ohio, and West Virginia. For example, in the tri-state area of Pennsylvania, Ohio, and West Virginia, 17,888 unconventional wells were drilled between 2004 and the end of 2018 (Penn

State Marcellus Center for Outreach and Research, 2015). While some may picture well pads as relatively small operations, they are increasingly very large industrial sites. The newer “superpads” are “concrete platforms that can house 30 wells, maybe even 40, with long horizontal tentacles stretching underground for up to 4 miles in each direction” (Litvak, 2018). Globally, similar activity is taking place in Canada and Australia, with the potential to occur in other countries.

The recent gas and oil boom associated with new unconventional drilling techniques has required large volumes of water to fracture rock formations. Forcing water, sand, and chemicals into the ground under high pressure has led to questions about the potential for methane gas and contaminants to be released into ground water (Howarth et al., 2011; Mooney, 2011). Separate from concerns about potential migration of pollutants to ground and water, there is the issue of produced waste at drilling sites. The “flowback” or “production water” that comes back up in these drilling operations contains naturally occurring and man-made toxins and has to be disposed of properly. A common technique for disposing of the fluid is the use of “injection wells” in which high volumes of fluid are pumped deep into the earth. Injection wells have been associated with earthquakes in the United States (Horton, 2012; Keranen et al., 2013). Drilling sites can also be associated with releases of chemicals and gasses to the air. Particularly under certain weather conditions in mountain valleys, they can be trapped in the atmosphere, contributing to spikes in ozone levels (as noted in numerous news articles in the winter of 2011 such as that by Gruver (2011)).

It goes without saying that extraction-based work is dangerous. In addition to facing potential injury from large equipment, from accidents (including truck accidents), from fires and intense explosions, mining and drilling crews face potential health issues related to dust inhalation and exposure to chemicals and radioactive material (Phillips, 2014; Shriver & Webb, 2009; Witter et al., 2014). As is the case with those handling pesticides, there is the potential for workers exposed on the job site to track trace amounts of those chemicals into their living environments, where they may pose a hazard to other family members (Kuhn as cited in Witter et al., 2014).

Rural population environmental and community issues associated with extraction industries. Though contamination of ground, water, and air have the potential to lead to negative public health outcomes in rural communities, tracking and monitoring contamination and its effects on health and well-being is extremely difficult. Messer, Shriver, and Kennedy (2010) note: “Community dissension and ambiguity are exacerbated by scientific uncertainty, contested illness claims, and contradictory sources of information” (p. 164). The public entities responsible for monitoring public health in the United States and elsewhere often lack the data to assess the impact. Multiple issues make it challenging to document harm to people: It can be difficult to establish a specific source of pollution as the cause (particularly among people who smoke or have other poor health habits, or among people who live in places with multiple sources of pollution); the ill-health effects associated with pollution and contamination can have significant lag times, with illnesses appearing years after exposure; individuals also respond differently to exposure. While the literature consistently notes that there are specific populations that are likely to be more vulnerable to ill effects from exposure (such as pregnant women, infants and children, and the elderly), the literature also makes it clear that how exposure affects people is highly

individualized and can be difficult to assess (Messer et al., 2010; Shriver & Webb, 2009). The “small n” problem further complicates things in rural areas. In research studies, the “n” refers to the sample size. It is hard to get a big sample in a rural area. This makes it difficult for rural public health officials and others to detect patterns of harm. A recent example illustrates this. 2014 news coverage of infant deaths in a rural community in Utah that has been going through an oil and gas drilling boom noted that to do a study on whether the infant deaths really represented a trend, they would need a much larger sample size than the community itself (Schlanger, 2014).

In some cases, policy creates barriers to accessing needed information. Prior to the most recent oil and gas boom in the United States, a clause negotiated in a major energy bill made the injection of chemicals in unconventional drilling exempt from federal clean drinking water regulation and made the chemical mixture used in the process of hydro-fracturing of shale proprietary information (de Melo-Martin et al., 2014; Finkel & Hays, 2013). This left the regulation of much of the activity largely in the hands of states and localities. The lack of federal oversight and proprietary status of chemicals used in the drilling process has been controversial. Similarly, the lack of carefully controlled public health studies prior to widespread use of the new techniques raised significant concerns for public health researchers and others (Finkel & Hays, 2013). More than one researcher has noted that if you cannot know what chemicals are being used, it is impossible to set up an appropriate monitoring system. In the absence of a monitoring system, it is impossible to assess the environmental and health impacts (de Melo-Martin et al., 2014). If, and when, rural people have problems like a water well that has gone bad or livestock getting sick, it can be hard for them to prove that anyone else has had any similar problems. Prior legal settlements against the company(ies) are frequently achieved through agreements in which the industry admits no harm and the people harmed agree to “gag orders”, prohibiting them from speaking to others about what happened (Fisher, 2015).

Environmental Justice and Rural Social Work

No one will argue it will be easy work, but engaging in efforts to achieve environmental justice would fundamentally change things for rural people and their communities. In the United States, the Environmental Protection Agency (EPA) has defined *environmental justice* as a goal we will achieve when everyone shares “the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn and work” (Environmental Protection Agency, 2016). From this perspective, environmental justice requires several conditions: equal protection from environmental harm, equal ability to engage in decision-making processes, and healthy, life-supporting environments for all. Given the profession of social work’s longstanding commitment to enhancing the wellbeing of people and our focus on person and environment, we should be able to apply our knowledge, values, and skills to engage in efforts to:

- (1) Advocate for more equitable distribution of environmental harm and equitable protection of rural people from environmental harm;
- (2) Facilitate access to information and participation in decision-making affecting the development of their communities; and,

(3) Participate in the development of sustainable, life-supporting rural environments.

Social workers are expected to engage in this work. At the international level, the International Federation of Social Workers has made it clear that there are international expectations that we will do so. They have adopted a Statement of Ethical Principles. Under Principle 4.1 Human Rights and Human Dignity (International Federation of Social Workers, 2012), you can find the following statements [*emphasis added*]:

Promoting the right to participation – Social workers should promote the full involvement and participation of people using their services in ways that enable them to be *empowered in all aspects of decisions and actions affecting their lives*.

Treating each person as a whole – Social workers should be concerned with the whole person, within the family, community, societal *and natural environments*, and should seek to recognize all aspects of a person's life.

At the national level, the Council on Social Work Education (CSWE) published new standards in 2015. The new standards make it clear that schools and departments of social work are expected to prepare social workers to address environmental justice concerns. This is heralded by the title of Competency 3: “Advance Human Rights and Social, Economic and Environmental Justice” (Council on Social Work Education, 2015, p. 7). While the standards are relatively new, the concern for environmental justice is not. Social work educators in the United States and abroad have been calling for greater attention to environmental crises and environmental injustice within the discipline of social work for years (cf., Besthorn, 2012; Dominelli, 2012, 2013; Hoff, 1998; Rogge, 1993; Rogge & Darkwa, 1996; Rogge et al., 2005, etc.). A “deep ecology” approach to social work has been encouraged by Fred Besthorn (2012) an approach that focuses on the mutual interdependence of people and their surrounding natural environments and calls us to rethink our behavior and interactions at every level. In her book *Green Social Work*, Lena Dominelli (2012) has published guidelines she developed for holistic and sustainable social work practice that:

...are consistent with a moral and ethical standpoint that advocates for an equitable distribution of the Earth's resources, a collective pooling of risks and benefits, and a duty of care towards the world and all living and material things in order to enjoy being cared for through the bounty that nature provides. (p. 195)

Working to promote environmental justice for rural clients and for mutual respect for surrounding rural environments can be challenging, but should not represent a sweeping change for rural social workers. The literature on rural social work has consistently noted the importance of place and seasonal change to rural people and rural cultures (Daley, 2015). Rural social workers are encouraged to prepare as generalists, knowledgeable about local culture and community and capable of engaging in community-focused work, even when seeking help for individuals and families (Davenport & Davenport, 2008). The intimate knowledge of the community required for competent rural social work practice, including the community's assets and challenges, is necessary for rural social workers building plans of care for their clients. Rural social workers are thus typically well-versed in the major sources of employment in the areas

they serve, the types of jobs available, and any environmental issues affecting the community and the surrounding environment (as well as potential barriers to addressing these issues). An argument is made here for use of Daley's (2015) "down home model" of rural social work practice. The model's focus on social exchange and the norms and mores of rural communities provides the context-specific emphasis that Dominelli (2012) notes is needed for practicing "green social work." Dominelli comments that she offers guidelines rather than an explicit model because context is so important. In the section that follows, two cases are presented. Social workers and social work students are encouraged to consider how the "down home model" coupled with a focus on holistic, sustainable practice could be applied to facilitate well-being and environmental justice.

Rural Environment Cases

The rural context presents particular challenges, including lack of formal resources and lack of anonymity. In places dominated by a single industry, not only does everyone know everyone else's business, threats to the only source of employment in town are not tolerated well. The big employer is often a major supporter of local charity and human service initiatives. Social workers engaged in pursuing environmental justice can easily find themselves embroiled in a community civil war that pits those protecting needed jobs against those seeking to protect the environment. Families can be divided and these battles are intense. As you read the case scenarios that follow, consider your options for helping these potential clients, their families, and the broader community in a small town context. Consider the roles you might take on as a social worker. Consider the likely barriers you will face in seeking to protect your clients from environmental harms and in seeking environmental justice for the community.

Case scenario #1. In a rural township that relies on coal mining for its best-paid jobs, a local Area Agency on Aging (AAA) is investigating the well-being of an elderly, retired miner. The agency was called by a local bank officer who noticed funds from the man's checking and savings accounts dropping a lot lately. The bank officer spoke to the man and was told, "Mind your business. Family takes care of family." The bank officer is concerned that someone in the man's family is taking economic advantage of him and depleting his resources. You have been sent by the AAA to investigate the situation. The gentleman lives alone but has family close by. He has trouble seeing and is only able to get around in his small home because he knows it so well and can "feel" his way around. He is able to dress himself and the home is well-maintained. After meeting him and spending some time gathering assessment information, you learn that he lives on Social Security and his pension. Together, the two sources of income were enough to provide for him. You notice that there are cases of bottled water and large plastic water jugs near the door. It looks like an awful lot of water. He tells you that his well, which was very deep, has run dry. The well provided water for him as well as his daughter and her kids, who were living in another house he built on his property, down the hill a bit. The land around his home has been in his family for generations. In the past year, he's started seeing big gashes in his land, like it is separating. He talked with the coal company and they did some work on some of the bigger gashes. He thinks the mining probably also damaged his well, causing it to go dry. He loves his small home and the land. He doesn't want to leave his home. He could not leave his daughter and her kids without water, though, so he paid to move them to an apartment in town and he is covering their rent each month, leaving him with very little for himself. His daughter has a part-

time, minimum wage job at a grocery store. Her children are still in school and it has been hard for her to find work that allows her to be home when her kids get home. After buying groceries for three and paying the bills, she did not have enough to cover rent. She hates taking her father's money for rent but was afraid if she stayed in her old home that the local child welfare people would find out about the well, and make trouble for her and her kids. Her father knows his land is worthless now that there is no water, so there is no point in trying to sell. You ask him if he has contacted the coal company about the well. He shrugs and says, "I'll never be able to prove they did it. Nobody wins going up against them."

From a person-environment perspective, this gentleman and his family are affected by a variety of forces, internal and external. Systems at the micro, mezzo and macro level are also important here and merit consideration. Your immediate client has a vision problem that appears to be quite serious and should be evaluated to determine whether anything can be done to help him and whether he qualifies as legally blind. He is a proud man who cares deeply about his family. His daughter and her children are of great concern. We do not know from the material presented whether he or his daughter attend a local church or have other natural supports in the community that should be explored. From a strengths perspective, he and his family are doing everything they can to care for each other in their home community, a place they love, and they appear to prize self- and family-reliance. This is very common in rural areas. He likely takes a great deal of pride in being able to help his daughter and her children, and in having been able to provide for his family financially as a miner. He is not likely to consider options that make him feel he is abandoning them in any way. An immediate concern is his (and by extension, their) financial situation. As a matter of justice, if the well was damaged by a third party, he should not have to be buying his own water. The social worker may find, however, that he is resistant to pushing on the coal company and possibly having to pursue legal action, because taking on the company may be perceived as threatening the livelihoods of his neighbors. His own prior work in mining may also complicate his feelings about what is happening. This is a common problem in mono-industry towns. A recent news story highlights the problem elsewhere. A midwife interviewed for a story on infant deaths in Utah noted: "I hate to blame the oil industry, because our livelihoods depend on it. If the [drilling] industry is strong, then the community is strong" (Schlanger, 2014). It is not uncommon for people who file suits against major employers in small towns to find themselves "on the outs" with locals. They may receive nasty phone calls, even threats. Long-time residents know their communities. If he has real fears, it is important not to disregard them. The social worker will have to spend time figuring out what types of support and intervention he is willing to consider. He did experience some success in having the company address land subsidence on his land. It may take time and consideration of other options for your client to be willing to go back to the company about the well.

The social worker needs to speak with the client about his willingness to contemplate other housing options for himself. He may or may not be willing to apply for such help. Obtaining this support is likely to mean moving to the county seat of the county they live within. Senior citizen housing tends to be located in county seats. If he is relocated, efforts should be undertaken to help him with the loss of his home and land. Attachment to land tends to run deep in rural areas and the loss of "home" is a major loss. Relocation can be particularly disorienting and difficult for older adults.

Situations like these can provide opportunities to engage clients in macro efforts focused on environmental preservation and sustainability. Being linked to support groups or organizations that work on environmental issues in rural areas may provide them with supportive ears, opportunities for empowerment, and legal aid to seek justice. These options should not be discounted for older adults. Important voices in recent rural environmental work have belonged to middle-aged and older adults. House and Howard's 2009 book *Something's Rising: Appalachians Fighting Mountaintop Removal* documents the efforts of a number of activists over fifty who engaged to end mountaintop removal, among them Judy Bonds (a grandmother in her late fifties when profiled) and Jean Ritchie (then an eighty-plus year old singer, songwriter and preservationist). Wilber's book on hydrofracking titled *Under the Surface* documents the efforts of grandmothers and other ordinary people concerned about their land, who have been actively engaged in calling attention to potential environmental issues (2012). In some cases, circumstances like these provide opportunities for individuals and families to become engaged with advocacy work on behalf of other neighbors or people like themselves in neighboring communities. This can help to alleviate their sense of isolation and bring attention to local and regional environmental justice issues. The work can be empowering and help with the pain and loss they have suffered. It does not always immediately change the situation or save their homes and communities, but discovering and using their voices to help others can provide new meaning for their lives and make a difference over time.

Case scenario #2: You moved to a small, rural community surrounded by heavy forest ten years ago. You grew up in a rural area and missed the quiet and small community life. When an ad showed up for a social worker in a county human services agency that serves the area, you applied and got the job. About five years ago, you got involved in a local community development group focused on sustainable economic development. Everyone participating in the group believes that eco-tourism could bring needed jobs and funds to the community without endangering the state-owned public forest neighboring the community. The forest was given to the state by a family that had logged the area for years. When it was "logged out" they donated the land to the state as a recreational area. Over the years, private campgrounds have been developed that attract tourists in the summer months. There are kayak and canoe rental companies that are family owned that do great business in the summer and early fall months. The forest has always been used for multiple purposes, however. There are still some small logging operations. At the latest meeting of your group, you hear that the governor of your state favors opening public, state-owned lands for drilling. Increased logging of the forest will have to take place to clear the land for drilling. The governor has announced her intention to start leasing public state forestland to drillers as soon as possible. The next day at work, you mention the plans to your co-workers and your concerns about what this will mean for the community and the existing eco-tourism businesses that are growing (like the canoe and kayak rentals). Your co-workers think the governor has the right idea. The drilling will mean great jobs for their children and grandchildren, and better paying jobs than what are here now. They make comments about newcomers not understanding how hard things have been for their families.

Two of the most important roles we can take on to promote environmental justice in the rural context are community educator and community development advocate. Both of these roles could be important to this scenario. As a member of a local community development group, you could propose undertaking some community education events. The focus of the community

education should be on providing access to unbiased information about rural community economic development and environmental threats and resources to address potential harm. The sessions on community development should include content on sustainable long-term social and economic development with information on the experiences of other communities that have confronted similar situations.

This could require multiple events with different community stakeholders. Providing access to information is empowering and essential to decision-making. For rural people to be able to participate fully in development decisions about their own communities, they need to be on more equal footing with corporate representatives seeking to influence government officials and residents. Seeking unbiased information is critically important, as the jobs vs. environment debate can create severe tensions in small communities. Social workers engaged in pursuing environmental justice can easily find themselves negatively labeled and mistrusted, at-odds with long-time locals in need of work. Families can be divided and these battles are intense. The jobs vs. environment debate often centers on a false dichotomy (as environmental protection and job development can be compatible). However, directly engaging in the debate with clients and community members is not necessary in your efforts to help them. Your community needs information.

Conclusion

Rural people and communities are often vulnerable to potential environmental harm because they are not just rural, they are “rural-industrial.” Small towns and villages around the world are affected by agribusiness and industries with common characteristics. A relatively small number of very large firms – often in agribusiness, petro-chemicals, or energy – operate globally. Their workers are frequently imported laborers (as migrant, seasonal or “guest” workers, or as teams of already-trained workers). The work itself is increasingly industrial in character, producing concentrated activity in particular locations (e.g., where certain types of farms or extraction operations are present). These rural-industrial activities can result in significant pollution and environmental devastation that affects the people, fish, and wildlife in the area.

As social workers, we are obligated to work to enhance the well-being of people. Increasingly we recognize that as professionals our focus on person and environment does not simply mean looking at people in relationship to the people and entities with which they interact. More and more, we have come to understand that the natural environments surrounding our clients are as important as the social environments surrounding them; they are interdependent. The well-being of people is highly dependent on the well-being of the surrounding natural environment. Historically, we have defended human rights and advocated for social and economic justice. Increasingly we have to recognize that when environments are devastated by toxins and pollution, when surrounding flora and fauna are suffering, people can also be negatively affected. Social work educators here and abroad are calling us to recognize these linkages and incorporate them into every level of practice. Rural social workers need to heed this call to be truly relevant to the present and future.

References

- A. P. Worldstream. (2009, March 13). Factory polluting Russian lake to close. Thomson Reuters WESTLAW.
- Areddy, J. T. (2012, September 3). "China coal sector has safety setback." *Wall Street Journal*. <http://www.wsj.com/articles/SB10000872396390443847404577628722372680112>
- Arcury, T.A., & Quandt, S.A. (2011). Living and working safely: Challenges for migrant and seasonal farmworkers. *N C Med J.*, Nov-Dec; 72(6): 466–470.
- Balazs, C. L., & Ray, I. (2014). The drinking water disparities framework: On the origins and persistence of inequities in exposure. *American Journal of Public Health*, 104, 603-611.
- Bernhardt, E. S., & Palmer, M. A. (2011). The environmental costs of mountaintop mining valley fill operations for aquatic ecosystems of the Central Appalachians. *Annals of the New York Academy of Sciences*, 1223, 39-57. doi:10.1111/j. 1749-6632.2011.05986.x
- Besthorn, F. H. (2012). Deep Ecology's contributions to social work: A ten-year retrospective. *International Journal of Social Welfare*, 21, 248-259. doi:10-1111/j.1468-2397.2011.00850.x
- Brisman, A. (2013). The violence of silence: Some reflections on access to information, public participation in decision-making, and access to justice in matters concerning the environment. *Crime Law Soc Change*, 49, 290-303. doi:10.1007/s10611-013-9416-3
- Bundale, B. (2019, December 20). Top stories of 2019: Atlantic Canada's biggest business news of the year. *Journal Pioneer*. <https://www.journalpioneer.com/business/local-business/top-stories-of-2019-atlantic-canadas-biggest-business-news-of-the-year-390793/>
- Bureau of Labor Statistics (January 2016). *Occupational outlook handbook, 2016-17 edition, Logging workers*. <http://www.bls.gov/ooh/farming-fishing-and-forestry/logging-workers.htm>
- Centers for Disease Control and Prevention (2010, March 10). *Water contamination*. <http://www.cdc.gov/healthywater/other/agricultural/contamination.html>
- Coal Business Unit, BNSF Railway. (2016, October 17). *Guide to coal mines: Mines served by BNSF railway*. Fort Worth, TX: BNSF Railway. <https://www.bnsf.com/ship-with-bnsf/maps-and-shipping-locations/pdf/MineGuide2016.pdf>
- Council on Social Work Education. (2015). *2015 Educational Policy and Accreditation Standards for Baccalaureate and Master's Social Work Programs*. Alexandria, VA: Council on Social Work Education.
- Daley, M. R. (2015). *Rural social work in the 21st century*. Chicago, IL: Lyceum Books, Inc.

- Davenport, J. A., & Davenport, J. (2008). Rural practice. In T. Mizrahi & L. E. Davis (Eds.), *Encyclopedia of Social Work*, (20th ed.), (536-541): National Association of Social Workers Press and Oxford University Press, 2008.
- DeHoop, C. F. (2010). *Tracking and analysis of logging accidents in Louisiana using industry-supplied data*. Louisiana State University. United States Department of Agriculture, Research, Education, & Economics Information System.
<http://www.reeis.usda.gov/web/crisprojectpages/0206776-tracking-and-analysis-of-logging-accidents-in-louisiana-using-industry-supplied-data.html>
- de Melo-Martin, I., Hays, J., & Finkel, M. L. (2014). The role of ethics in shale gas policies. *Science of the Total Environment*, 470-471, 1114-1119.
- Dominelli, L. (2012). *Green social work: From environmental crisis to environmental justice*. Cambridge, United Kingdom: Polity Press.
- Dominelli, L. (2013). Environmental justice at the heart of social work practice: Greening the profession. *International Journal of Social Welfare*, 22, 431-439.
doi:10.1111/ijsw.12024
- Environmental Protection Agency (1999, April 20). EPA cracks down on polluting pulp mills. *News releases from Region 3*.
<http://yosemite.epa.gov/opa/admpress.nsf/90829d899627a1d98525735900400c2b/3ab519e7c99b57a7852570d60070f9df!opendocument>
- Environmental Protection Agency (2016, September 14). *Environmental justice*.
<https://www.epa.gov/environmentaljustice>
- Finkel, M. L., & Hays, J. (2013). The implications of unconventional drilling for natural gas: A global public health concern. *Public Health*. <http://dx.doi.org/10.1016/j.puhe.2013.07.005>
- Fisher, K. (2015, January 21). Communities in the dark: The use of state sunshine laws to shed light on the fracking industry. *Boston College Environmental Affairs Law Review*, 42, 99-131. <http://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=2155&context=ealr>
- The Food and Agriculture Organization of the United Nations. (2016). *Global forest resources assessment 2015: How are the world's forests changing* (2nd ed.). Rome, Italy: United Nations Food and Agriculture Organization. Retrieved from <http://www.fao.org/3/a-i4793e.pdf>
- Gruver, M. (2011, March 9). Wyoming's natural gas boom comes with smog attached. NBC News. http://www.nbcnews.com/id/41971686/ns/us_news-environment/t/wyomings-natural-gas-boom-comes-smog-attached/#.Xg4uVkdKhRY

- Gurian-Sherman, D. (2008). *CAFOs uncovered: The untold costs of confined animal feeding operations*. Union of Concerned Scientists. <https://www.ucsusa.org/resources/confined-animal-feeding-operations-uncovered>
- Hendrickson, M., & James, H. S. (2004). *The ethics of constrained choice: How the industrialization of agriculture impacts farming and farmer behavior*. Department of Agricultural Economics Working Paper No. AEW P 2004-03. Columbia, Missouri: University of Missouri-Columbia Department of Agricultural Economics, Social Sciences Unit of the College of Agriculture, Food and Natural Resources.
- Harper-Dorton, K., & Harper, S. J. (2015). Social and environmental justice and the water-energy nexus: A quest in progress for rural people. *Contemporary Rural Social Work*, 7 (1), 12-25.
- Hoff, M. D. (ed.). (1998). *Sustainable community development: Studies in economic, environmental, and cultural revitalization*. CRC Press. Boca Raton: Florida.
- House, S., & Howard, J. (2009). *Something's rising: Appalachians fighting mountaintop removal*. Lexington, KY: University Press of Kentucky.
- Howarth, R. W., Ingraffea, A., & Engelder, T. (2011, September 15). Natural gas: Should fracking stop? *Nature* 477, 277-275. doi:10.1038/477271a
- Horton, S. (March/April 2012). Disposal of hydrofracking waste fluid by injection into subsurface aquifers triggers earthquake swarm in central Arkansas with potential for damaging earthquake. *Seismological Research Letters*, 83, 250-260.
- Hribar, C., & Schultz, M. (2010). *Understanding concentrated animal feeding operations and their impact on communities*. Bowling Green, OH: National Association of Local Boards of Health. https://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf
- International Federation of Social Workers. (2012, March 3). *Statement of ethical principles*. <http://ifsw.org/policies/statement-of-ethical-principles/>
- Jacques, M. L., Gibbs, C., Rivers, L., & Dobson, T. (2012). Expanding environmental justice: A case study of community risk and benefit perceptions of industrial animal farming operations. *Race, Gender & Class*, 19, 218-243.
- Keim-Malpass, J., Spears Johnson, C. R., Quandt, S. A., & Arcury, T. A. (2015). Perceptions of housing conditions among migrant farmworkers and their families: Implications for health, safety and social policy. *Rural Remote Health*, 15, 3076. <https://www.rrh.org.au/journal/article/3076>
- Kelso, M. (2015, August). 1.7 million wells in the U.S. – a 2015 update. *Fractracker Alliance Newsletter*. Retrieved from <http://www.fractracker.org/2015/08/1-7-million-wells/>

- Keranin, K. M., Savage, H. M., Abers, G. A., & Cochran, E. S. (2013, June). Potentially induced earthquakes in Oklahoma, USA: Links between wastewater injection and the 2011 M_w 5.7 earthquake sequence. *Geology*, 699-702. doi: 10.1130/G34045.1
- Kirkhorn, S. R., & Garry, V. F. (2000). Agricultural lung diseases. *Environmental Health Perspectives*, 108 (Supplement 4): 705-712.
- Litvak, A. (2018, January 15). These days, oil and gas companies are super-sizing their well pads. *Pittsburgh Post-Gazette*. <https://www.post-gazette.com/business/powersource/2018/01/15/these-days-oil-and-gas-companies-are-super-sizing-their-well-pads/stories/201801140023>
- Martin, A. (2013). Global environmental in/justice, in practice: introduction. *The Geographical Journal*, 179, 98-104. doi:10.1111/geoj.12021
- Martin, L. (2015). *Smokestacks in the hills: Rural-industrial workers in West Virginia*. Champaign, Ill: University of Illinois Press.
- Messer, C. M., Shriver, T. E., & Kennedy, D. (2010). Environmental hazards and community dissent in rural Oklahoma. *Sociological Spectrum*, 30, 159-183. doi:10.1080/02732170903496034
- Miller, S. E., & Hayward, R. A. (2013). Social work education's role in addressing people and a planet at risk. *Social Work Education: The International Journal*. <http://dx.doi.org/10.1080/02615479.2013.805192>
- Miller, S. E., Hayward, R. A., & Shaw, T. V. (2012). Environmental shifts for social work: A principles approach. *International Journal of Social Welfare*, 21, 270-277.
- Mooney, C. (2011). The truth about fracking. *Scientific American* 305, 80-85. doi:10.1038/scientificamerican1111-80
- National Center for Farmworker Health, Inc. (2012, September). Farmworker health factsheet. http://www.ncfh.org/uploads/3/8/6/8/38685499/fs-migrant_demographics.pdf
- Natural Resources Defense Council (2013, February 21). *Pollution from giant livestock farms threatens public health; Waste lagoons and manure sprayfields -- two widespread and environmentally hazardous technologies -- are poorly regulated*. <http://www.nrdc.org/water/pollution/nspills.asp>
- Occupational Safety and Health Administration. (n.d.). Safety and health topics: Agricultural operations: Hazards and controls. https://www.osha.gov/dsg/topics/agriculturaloperations/hazards_controls.html
- Occupational Safety and Health Administration /The National Institute for Occupational Safety and Health. (2015). Recommended practices: Green tobacco sickness. DHHS (NIOSH)

Publication Number 2015-104/OSHA 3765-2015.
<https://www.osha.gov/Publications/OSHA3765.pdf>

Oswalt, S. N., Smith, W. B., Miles, P.D., & Pugh, S. A. (2014, October). *Forest resources of the United States, 2012: A technical document supporting the Forest Service update of the 2010 RPA assessment*. General Technical Report WO-91. Washington, DC: United States Department of Agriculture.

Otte, J., Roland-Holst, D., Pfeiffer, D., Soares-Magalhaes, R., Rushton, J., Graham, J., & Silbergeld, E. (2007, June). Industrial livestock production and global health risks. A Living from Livestock Research Report. *Pro-Poor Livestock Policy Initiative*.
https://assets.publishing.service.gov.uk/media/57a08bd540f0b64974000dd6/PPLPIrep-hpai_industrialisationrisks.pdf

Palmer, Ms. A., Bernhardt, E. S., Schlesinger, W. H., Eshleman, K. N., Fougoula-Georgiou, E., Hendryz, M. S., Lemly, A. D., Likens, G. E., Loucks, O. L., Power, M. E., White, P.S., & Wilcock, P. R. (2010). Mountaintop mining consequences. *Science*, 08, 148-149.
doi:10.1126/science.1180543

Patterson, B. (2019, January 9). Energy lobbyist calls for legislature to condemn “rogue” enviros. *West Virginia Public Broadcasting*. Retrieved from <https://wvpublic.org/post/energy-lobbyist-calls-legislature-condemn-rogue-enviros#stream/0>

Peeters, J. (2012). The place of social work in sustainable development: Towards ecosocial practice. *International Journal of Social Welfare*, 21, 287-298. doi:10.1111/j.1468-2397.2022.00856x

Penn State Marcellus Center for Outreach and Research (MCOR). (2015). *Unconventional wells drilled by year*. <http://www.marcellus.psu.edu/resources/images/tristate-wells-by-year.gif>

Phillips, S. (2014, August 28). New study shows gas workers could be exposed to dangerous levels of benzene. *State Impact*.
<https://stateimpact.npr.org/pennsylvania/2014/08/28/new-study-shows-gas-workers-could-be-exposed-to-dangerous-levels-of-benzene/>

Pingali, P. L. (2012, July 31). Green revolution: Impacts, limits, and the path ahead. *Proc Natl Acad Sci U S A*, 109(31): 12302–12308.

Rogge, M. E. (1993). Social work, disenfranchised communities, and the natural environment: Field education opportunities. *Journal of Social Work Education*, 29(1), 111-120.

Rogge, M. E., & Combs-Orme, T. (2003). Protecting children from chemical exposure: Social work and U.S. social welfare policy. *Social Work*, 48, 439-450.

- Rogge, M. E., & Darkwa, O. K. (1996). Poverty and the environment: An international perspective for social work. *International Social Work*, 39: 395-409.
- Rogge, M. E., Davis, K., Maddox, D., & Jackson, M. (2005). Leveraging environmental, social, and economic justice at Chattanooga Creek: A case study. *Journal of Community Practice*, 13, 33-53. doi:10.1300/J125v13n03_03
- Schlanger, Z. (2014, May 21). In Utah boom town, a spike in infant deaths raises questions. *Newsweek*. <http://www.newsweek.com/2014/05/30/utah-boom-town-spike-infant-deaths-raises-questions-251605.html>
- Shiva, V. (2014a). Seeds of suicide: The ecological and human costs of the globalization of agriculture. In V. Shiva, *The Vandana Shiva Reader* (179-218). Lexington, KY: University Press of Kentucky.
- Shiva, V. (2014b). The hijacking of the global food supply. In V. Shiva, *The Vandana Shiva Reader* (41-54). Lexington, KY: University Press of Kentucky.
- Shriver, T. E., & Webb, G. R. (2009). Rethinking the scope of environmental injustice: Perceptions of health hazards in a rural Native American community exposed to Carbon Black. *Rural Sociology*, 74, 270-292.
- Staff Reporter. (2007, December 11). Residents oppose establishment of paper mill. *Hindu Katsuri & Sons*. Thomson Reuters WESTLAW.
- Trautmann, N.M., Porter, K.S., & Wagenet, R. J. (2012). Fact sheet: Pesticides and groundwater: A guide for the pesticide user. Pesticide Safety Education Program (PSEP), Cornell University Cooperative Extensions, Cornell University.
- United Nations Food and Agricultural Organization. (2009). *How to feed the world in 2050. High level expert forum*. <http://www.fao.org/wsfs/forum2050/wsfs-forum/en/>
- U.S. Energy Information Administration (EIA) (2019). Coal explained: Where our coal comes from. <https://www.eia.gov/energyexplained/coal/where-our-coal-comes-from.php>
- U. S. Newswire. (2002, April 19). DC circuit upholds water pollution discharge limitations for pulp and paper mills. *U. S. Newswire*. Thomson Reuters WESTLAW.
- Wallace, S. (2016, January 21). Illegal loggers wage war on indigenous people in Brazil. *National Geographic*. <http://news.nationalgeographic.com/2016/01/160120-brazil-illegal-logging-indigenous-people-Amazon-Basin-Awa-ibama/>
- Wilber, T. (2012). *Under the surface: Fracking, fortunes, and the fate of the Marcellus shale*. Ithaca, NY: Cornell University Press.

- Wilger, S. (2016). National Rural Health Association policy brief: Definition of frontier. National Rural Health Association.
<https://www.ruralhealthweb.org/getattachment/Advocate/Policy-Documents/NRHAFrontierDefPolicyPaperFeb2016.pdf.aspx>
- Willett, J. (2015). The slow violence of climate change in poor rural Kenyan communities: “Water is life. Water is everything.” *Contemporary Rural Social Work Journal*, 7 (1), 39-55.
- Wing, S., Cole, D., & Grant, G. (2000). Environmental injustice in North Carolina’s hog industry. *Environmental Health Perspectives*, 108(3): 225–231.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637958/>
- Witter, R. Z., Tenney, L., Clark, S., & Newman, L. S. (2014). Occupational exposures in the oil and gas extraction industry: State of the science and research recommendations. *Am J Ind Med*, 57(7), 847–856. doi:10.1002/ajim.22316.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4469339/>