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Economic Stratification and Environmental Management: A Case Study of the New York City Catskill/Delaware Watershed

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ABSTRACT

Long run success in watershed management requires understanding of how economic stratification and social values affect water quality protection. Feedback effects on water quality are produced by three aspects of economic well-being: income levels, quality of life and inequality, including the effects of gender based inequality. In the US emphasis on individualistic values leads to reliance on local and private policy solutions to social problems. Analysis of the context of New York City's internationally famous watershed agreement with communities 120 miles distant provides a case study of these relationships. The nature of economic stratification in these upstate communities and the insufficient response of social policies were an impediment to achieving New York City's water quality goals. As a consequence the City's watershed agreement contains direct economic aid to Watershed communities. The Agreement does not address all stratification issues. Some call for solutions beyond the local level and an approach that benefits from the European emphasis on community. It is in the interest of watershed managers to broaden the scope of their concerns to understand and support state and national programs which address problems created by economic stratification. The expansion of the European Union increases the relevance of these lessons for Europe.

KEYWORDS

Watershed, sustainable development, environmental management, environmental policy, economic stratification, gender inequality, collaboration.

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New York City has a watershed agreement to protect its water supply that has received international attention. The water supply lies in watersheds outside of the City's borders, some 120 miles north. The collaborative agreement designed to protect this water supply is one designed to promote sustainable development in those watersheds so that the City can avoid having to build a 6 billion dollar filtration plant. The City is, in essence, paying to preserve nature's services.

The City is spending a large amount of money in the upstate watershed economies – over $2 billion by 2002 (Graf 2003) – and the breadth and depth of the City's involvement in those local economies is notable. One of the significant reasons for the extent of the City's involvement can be found in an analysis of how economic stratification affects the ability of local areas to protect their water supplies in general and in the watershed areas in particular.

This analysis is of general interest because the conditions found in the local economies of the City's watershed are not uncommon in the United States. In fact, the infrastructure in US watersheds is in great need of repair. The analysis of this collaboration will also be of interest to the European community as they respond to the European Water Directive and prepare their River Basin Plans for 2009.

The approach to management of watershed resources has roots in society's laws, which are themselves rooted in a society's values. As Rothenberg (1992) has argued, the difference between US and European environmental protection policies reflects general differences in the value placed on the individual versus the community in the approach to social problems. In Europe more weight has traditionally been given to community concerns, and national solutions are more easily accepted. In the US the focus on the individual is coupled with a preference for local solutions. However, the concrete dynamics of some environmental problems and the social forces that affect them create effects that are too broad to be managed by individuals or local policies. Now that Europe is seeking to promote comprehensive water policies under the European Water Directive (Griffiths 2002) and to integrate a diverse range of countries into this undertaking (EEA 2003), the lessons of the fragmented, localised approach in the United States become more relevant.

The condition of the drinking and wastewater infrastructure in the US is so poor that it not only received the very low grade of D in the most recent assessment of the Society of Civil Engineers (ASCE), its condition was actually characterised as deteriorating (ASCE 2003). Furthermore, from 39 to 51 per cent of bodies of water assessed by the Environmental Protection Agency (EPA) in 2003 did not meet standards for fishing or swimming (USEPA 2003). Because water is essential to our survival, it is critical that we understand how our society produced these highly undesirable results. While others such as the ASCE have identified clearly visible contributing factors such as the low level of funding from various sources (ASCE 2003), this paper will examine underlying forces

not generally associated with the maintenance of water quality: problems created by economic stratification in general and gender stratification in particular.

ANALYTIC FRAMEWORK AND CASE STUDY

The analytic framework of the paper draws on the author's synthesis of insights from diverse literatures including environmental economics, socio-economic indicator development, quality of life, economics of gender, and the economics of inequality. The analysis also refers to research specific to the New York City Catskill/Delaware Watershed. The empirical section of the paper utilises the author's analysis of census data for the five Watershed counties (Table 1) and extensive interviews conducted by the author in the Watershed counties. Interviews were conducted with providers of basic services such as child care and transportation. The information utilised also draws on the author's extensive interviews with watershed town supervisors, as well as presentations and audience questions at New York City Watershed conferences attended by the author.

INTERDEPENDENCIES BETWEEN ECONOMIC WELL-BEING AND WATER QUALITY

Economic stratification affects water quality through three aspects of economic well-being: level of income, quality of life, and inequality itself. Maintenance of water quality is most usefully understood as requiring attention to both stock and flow issues. Stock issues have to do with the state of the infrastructure; flow issues are concerned with current activities that affect water quality, such as pollution. These relationships are interactive, as discussed below and modelled in Figure 1.

Water Quality

Flow problems such as toxic run-off into reservoirs are more readily perceived than degradation of stock problems such as maintenance of sewage treatment plants. Infrastructure depreciates in a non-linear fashion; inadequate maintenance will shorten its life severely while regular maintenance can extend its life significantly (by many decades). Despite the costs of postponement, both incentive systems and economic pressures may prevent sufficient maintenance spending. US government funding tends to be directed at initiating rather than maintaining capital projects (Hoffman 2000a). Individuals tend to delay spending on their own infrastructure such as septic tanks because of the general human preference to spend on current rather than future consumption (Goodstein 2002). A common illustration of this economic behavioural law is the reluctance of

TABLE 1. Economic pressures in Watershed Counties.

	Delaware	Greene	Scholharie	Sullivan	Ulster
COMPARISONS WITH US INCOME LEVELS					
1999 median income as % of US median income	94.5	86.9	87.1	88.1	1.01
1999 per cap. income as % of US per cap. income	81	87.5	82.4	87.5	96.3
REAL INCOME TRENDS					
% rise real per cap.income 1990–8 (a)	10.2	6.5	8.1	5.1	0.8
% change real median hshld income* 1989–99 (b)	-0.7	-2	3.5	-1	-7.7
% change real insured average weekly wage (c)	*2.38*	*-6.29*	*10.2*	*-3.3*	*-20.2*
INEQUALITY INDICATORS					
ratio per cap. income to avrerage weekly (d) 1990	38.6	44.2	40.7	47.9	42.2
1998	40.9	55.2	50.0	57.4	54.5
%: **female**/male full-time year round median income 1999	80.5	71.1	77.3	71.5	73.6
HOUSEHOLD POVERTY					
all households % poor 1989 (e)	12.8	10	12	13	9
1999 (f)	12.9	12.2	11.4	16.3	11.4
female headed households % poor 1999 (f)	28.2	29.4	24.8	19.7	22.5
% poor w. children<18	39.9	36.5	33.9	37.9	31.4
EMPLOYMENT					
% changeprivate nonfarm employment 1990–8 (c)	-4.3	-2.2	19	-7.1	6.9
% employment in services and trade 1997–8 (g)	45.7	56.5	na	61.4	53.9
HOUSING COSTS					
% paying over 30% income for mortage 1989(e)	18.6	22.4	18.3	24.9	24.8
1999 (e)	24.2	23.5	21.8	27.7	24.2
% rise in median house selling price 1995–9 (e)	10.8	6.4	4.5	9	9.4
renters % of renters unable to afford fair market rent for a one bedroom apt 1998 (h)	38%	38%	32%	43%	47%
seasonal housing as% of total stock 1999(f)	26.6	22.4	18.0	29.8	6.7
DECLINE IN TANF(i)					
% drop 1996–2000	69	43	60	55	52
Case load as % of 2000 population (i)	0.8	1.1	0.6	1.2	1.1

Notes to Table 1

(a) my calculations based on BLS http://146.142.424/cgi-bin/surveymost and NY State Department of Labor data (Table 1)

(b) my calculations BLS consumer price index for NY-NJ (1983–4=100) & 2000 Census quickfacts file

(c) my calculations based on bls http://146.142.424/cgi-bin/surveymost and http://www.labor.state.ny.us/htm/insured/insured.asp

(d) my calculations based on above data

(e) 1990 Census

(f) 2000 Census

(g) my calculations based on 2000 Census

(h) http://www.nlihc.org/pubs/patchwork.pdf

(i) TANF: Temporary Assistance for Needy Families. My calculations based on Fiscal Policy Institute and 2000 Census data. Fiscal Policy Institute (2001), 'Proportion of New York county TANF caseloads reaching the federal family assistance time limit', online at www.fiscalpolicy.org/ESJTimeLimits.pdf

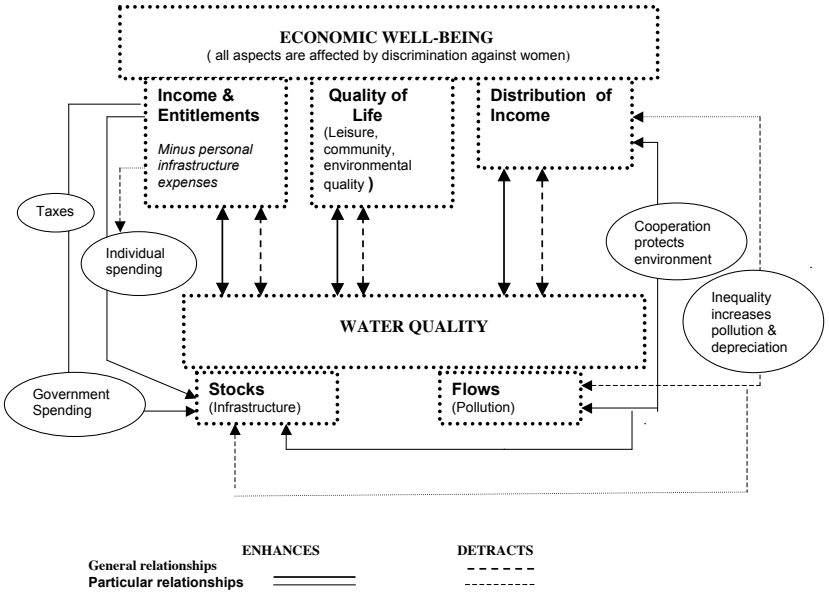

FIGURE 1. Interrelationship of well-being and water quality.

consumers to pay the premium for long-lasting light bulbs, which cost a small fraction of the price of septic maintenance. This tendency to postpone maintenance is exacerbated when people or communities have low incomes and other pressing present-day needs.

Economic Well-Being

Although not traditionally a focus of watershed management, three aspects of economic welfare can be shown to be important to both current and long-run human well-being and thereby to indirectly affect the maintenance of water quality in both the short and long run. The three categories – level of income, quality of life and inequality – and their feedback effects on water quality are discussed below.

Economic Well-Being: Level of Income

Lower levels of income affect watershed management in three ways: current purchases, maintenance of individually owned infrastructure, and lower tax revenues. An example of the first is that those at lower income levels tend to buy cheaper products more toxic to the water supply, such as used cars with high emissions.[1] In the second case, reduced maintenance on such items as cars, homes and septic tanks can have negative impacts on water quality. Fluids from poorly maintained cars fall on the impervious surface of roads and are easily swept into the water supply by storms. Septic tanks not pumped at appropriate intervals can release more pathogens into the water supply than the leach field can cleanse. Unmaintained homes can affect water directly from leaking pipes and tanks. In the third case, the property tax base is reduced by housing depreciation when those with low incomes reduce their housing maintenance. Income tax flows are reduced directly by low incomes, and sales taxes are reduced indirectly as a result of reduced purchases. Diminished tax revenues reduce the ability of governments to treat their own emissions and maintain the community's water quality infrastructure.

Analysis of income must recognise non-monetary components of the standard of living such as food stamps and child-care subsidies. Environmental quality itself affects the standard of living that a given income can buy. Dirty water and air leave people with less disposable income because they incur higher expenses for cleaning (e.g. filters, laundry, homes and offices), replacement (e.g. paint) and healthcare (e.g. asthma). These non-monetary factors affect how much cash people have available to make purchases relevant to water quality maintenance.

The incidence of low income in the US falls disproportionately on women and minorities. In general discrimination against women and minorities reduces their income (Blau, Ferber, and Winkler 1998) and thus their ability to contribute to water quality through personal spending or indirectly through taxes. Both have a disproportionate share of contingent (including part-time) labour force

jobs, which tend not to provide health, education and child-care benefits (Lovell and Hartmen 2001, USBLS 2001b, c, d). In particular, low income single mothers' economic problems are exacerbated by childcare responsibilities. Edin and Lein's study (1997) of how low income single mothers manage their lives shows them reaching out to others for financial assistance just to meet their immediate expenses such as food. Daily pressures can lead them to let car, housing and septic maintenance slide.

Level of income also affects future economic well-being, and thus long-run water quality. People need either money income or benefits to finance their 'personal infrastructure' expenses such as health, housing, childcare and education for themselves and their families. These are capital or human capital expenses which help determine future incomes.

Economic Well-Being: Quality of Life

People's quality of life is affected by non-income elements which are important in and of themselves (Baldwin 1990) and have feedback effects on long-run well-being and watershed management. One example is leisure time, which affects a range of behaviours such as engaging in family intimacy, participating in community activities (neighbourhood chatting, volunteer activities and community meetings), undertaking housing maintenance, and even taking time to pursue training and education, which in turn affects future income. The last three can all affect water quality. For instance, future income and housing maintenance have indirect effects on the tax base available to maintain water infrastructure. A second example is community interaction, which is a joint product of available time and appropriate infrastructure (from park benches to community halls) (Wismer 1999). Community interaction affects the cooperation needed to maintain the water quality, whether the problems are internal to the community, or an external threat of pollution by outsiders. Community volunteers are increasingly considered a vital ingredient of watershed management (Byron and Curtis 2002, Wondolleck and Yaffee 2000). At the personal level, community interaction also contributes to the building of social capital or networks that provide everything from safety to information about available jobs (Borjas 1995). Information connections that reduce unemployment also bolster the tax base.

Lower income people in general, and women in particular, experience pressures that make it difficult to take time for leisure and community interaction. The fastest growing job sectors (such as services) are those with the most part-time jobs, and a shift in the job market has increased the proportion of contingent work arrangements, which are less likely than full time jobs to provide benefits (Fallick 1999, USBLS 2001d). Some people hold two jobs to make ends meet. Full-time jobholders are increasingly called upon to do overtime work, paid or unpaid. While moonlighting and overtime raise incomes, they reduce time for leisure and community interaction. Women and minorities are especially likely to have part-time jobs and jobs without benefits (Fallick 1999, USBLS

2001d). Also, more families have both parents working than in the past, but women still provide a disproportionate share of housework and childcare (e.g., Sirianni and Negrey 2000). Therefore they have less leisure time than men in general. The demand on women's time for performance of what economists call reproductive services affects their current and future incomes and time for community interaction.

Of course, general environmental quality is also an important aspect of the quality of life.[2] The feedback effects on water quality from other forms of pollution include deposits from air pollution and run off from toxic waste.

Economic Well-being: Inequality

Variety in personal preferences about how people wish to allocate their time between paid and unpaid activities would, in any society, produce differences in income distribution. However, distribution of economic and social benefits can be so unequal and perceived to be so unfair as to be 'dysfunctional' from the standpoint of human well-being. Inequality is significantly associated with higher death rates in general and for infants in particular (Breen 2002). Greater inequality can lead to less investment in the education of lower income groups, which results in lower future growth rates (Perotti 1993). Disadvantaged, economically segregated communities have been shown to provide fewer community resources for the long-run development of their inhabitants (Borjas 1995). All of the foregoing indirectly diminish public revenues available for watershed management.

There are other negative feedback effects of 'dysfunctional' inequality for watershed management. Inadequate investment in environmental infrastructure, such as sewage and water systems for the poor, is all too common (Nierenberg 2002, Todaro and Smith 2002). Inequality results in environmental injustice or disproportionate shares of pollution being located in disempowered poor communities, especially poor minority communities (Goodstein 2002, Tietenberg 2000). The net effect can be more total pollution. Because the disadvantaged lack the time and resources to fight the location of pollution sources in their communities, less pollution is experienced by those outside such communities, resulting in less pressure on polluters to clean up the process of production. In the workplace, workers disempowered by race, gender or class discrimination also have trouble fighting for clean production processes. Women with a disproportionate share of lower status jobs and more household responsibilities are particularly disadvantaged in the struggle for healthy working conditions. The increased pollution resulting from inequality spreads out into the larger community through such means as the streams of the water and air and contaminated products, such as food containing pesticides. Finally, dysfunctional inequality creates resentment, which undermines the cooperation so vital to maintaining the environmental base. The boundaries of environmental protection are so diffuse in our society that they can never be policed (Hoffman 2000b, Hyatt and Trexler 1996).

The foregoing analysis of the relationship between stratification and watershed protection is general. In what follows, the particular characteristics of stratification in New York City's Catskill/Delaware watershed will be analysed to provide insight into the reasons for the breadth and depth of the City's watershed collaborative agreement. Some ways in which that agreement does not support problems created by stratification will also be examined. The role that individualistic social values in the US play in the policy gaps will be discussed. Contrasts with the more European community-oriented approach to social problems will inform suggestions for changes in the approach to the conception of watershed management.

CASE STUDY: NEW YORK CITY WATERSHED AGREEMENT

New York is one of an increasing number of urban areas around the world that draws its water from outside of its political boundaries (NRC 2000, Galusha 1999). New York City has long lacked sufficient water in its immediate environs to provide for its large population. The search for water sources beyond its borders began in the nineteenth Century and eventually led to the construction of a vast system of 19 upstate reservoirs and three artificial lakes over an area of 1972 square miles. The construction lasted from 1837 to 1967. The construction of these reservoirs involved the aggressive use of eminent domain (compulsory purchase), which stirred up considerable community resentment. That resentment was embodied in persons still living when in the 1980s an EPA ruling required that the City take steps to protect the quality of its upstate water supply. When the City began to take steps to regulate the water supply, upstate community residents whose families' or neighbours' lives had been disturbed by the City's creation of the reservoir system organised to prevent the City from using eminent domain and to affect the conditions under which the water supply would be protected (Galusha 1999). The ultimate result was an agreement called the Memorandum of Agreement (MOA or Memorandum), which concerns itself with both water quality and the economic welfare of upstate residents.[3] The agreement does recognise the interaction between human and environmental well-being. Discussion of the nature of the agreement and the economy of the five contiguous counties containing the Catskill Delaware watershed will demonstrate why this recognition was necessary, where more could be done, and lessons for other areas of the country.

The current era of water protection in the City began in 1986 when the US Environmental Protection Agency (EPA) promulgated a rule decreeing that all water suppliers serving over 100,000 consumers had to filter their drinking water. The Catskill Mountain source of the City's water lies 120 miles north of the City, supplies 90 per cent of the City's water and is very clean.[4] Therefore, in 1992, 1997 and again in 2002 the City has been able to procure filtration

avoidance determinations (FAD or Filtration Deals) of five years duration each for this watershed, by agreeing to take steps to protect the cleanliness of the water supply. Since the filtration plant would cost at least $6 billion, the City undertook a program to promote sustainable development with regard to water quality in the Catskill/Delaware watershed[5] in order to avoid that cost (NRC 2000). The City became willing to spend money to preserve nature's natural filtration services.

However, the Filtration Deal was not easily obtained. Three fourths of the Catskill/Delaware watershed was privately owned (NRC 2000 p.260). The City had to have the cooperation of local residents, so when local people mobilised in order to affect how the City responded to the EPA ruling, they were able to be effective. The first cooperative result was the creation of the Watershed Agricultural Council (WAC) in 1991, designed to address the protests of farmers. The Council's task was to work out voluntary whole farm plans for farmers that would allow the farming community to avoid direct regulation by altering their farming practices to protect the water supply (Galusha 1999, NRC 2000). The second cooperative result was the 1997 Memorandum, which enabled the City to obtain the second Filtration Deal from the EPA. The complexity of the process and arrangement is suggested by the many signers of the Memorandum, which included New York City and State, the USEPA, a Coalition of 34 Watershed towns, 9 villages and 5 Watershed Catskill/Delaware counties, Watershed communities, and locally active non-profit organisations (CCCD 1997). The third Filtration Deal, obtained in 2002, also involved the City in negotiations with local communities prior to obtaining the EPA's signature on the new agreement (USEPA 2002).

The Memorandum is comprehensive. There are water regulations, but there is also money to nurture upstate development through a series of grants and loans provided by the City. The City agreed to spend almost $300 million on a partnership program with local communities to help finance the repair of local infrastructure and encourage local development compatible with maintaining water quality. In addition, an open commitment was made to upgrading waste water treatment plants (CCCD 1997: 19–22). A locally run oversight organisation, the Catskill Watershed Corporation (CWC), was created and funded by the City to oversee the implementation process (NRC 2000, CCCD 1997).

The ultimate success of the agreement requires that the water quality be maintained. In the short run, obtaining the approval of the EPA is contingent on the City's adherence to the agreement. Over the long run the development of more and enhanced water quality data will be available to assess the impact of the agreement. Water quality depends both on reducing flows of pollution and on maintaining and improving environmental infrastructure. The Watershed has little industry, so most pollution flows from villages, farms (primarily dairy) and septic tanks (NRC 2000). The link between the water quality and the local economy is quickly apparent. Low levels of income cannot support the repair

and desired upgrading of environmental infrastructure such as septic tanks and sewage plants. It is also clear that the goal of promoting economic well-being among the local residents needs to be an integral part of the project, because the cooperation of local residents is critical to the success of the plan (NRC 2000). The 1600 square mile Catskill/Delaware Watershed cannot be effectively protected and controlled through police action alone. Community cooperation is necessary for everything from reporting polluters (or terrorists) to obtaining private property owners' cooperation in projects designed to reduce silt from building up in streams and therefore reservoirs.

An examination of the various aspects of economic well-being in the five Catskill/Delaware Watershed counties reveals why the City had to provide considerable funding to the upstate communities to secure its goals. The five Watershed counties are the units of analysis for this discussion, because data for smaller areas are sparse in general, and watersheds are not political units for which data are gathered by any level of government. The Watershed is in the more rural and poor part of the counties. The Watershed county communities outside of the Catskill/Delaware Watershed, like most US communities, are not being aided by an outside funder like New York City. Their situation thus provides a basis for reflection on the adequacy of water protection policies in general.

Watershed Counties' Economic Well-Being: Level of Income

Not only are these counties characterised by relatively low per capita and median incomes, their poverty rates rose over the 1990s. (In one county, the real weekly wage dropped by 20 per cent over the decade.) The quantity and quality of job opportunities explain the low income problem. Non-farm employment actually declined in three of the five counties over the nineties. Many of the jobs that do exist are in low paying industries such as trade and services which are characterised by part-time and contingent work and low rates of unionisation (Table 1).[6] (Surdey, 2000a, b)

Several indicators suggest that women have disproportionate representation among low income persons. Full time year round female workers make at least 20 per cent less than men; poverty among single mothers is between double and triple the average poverty rate (Table 1). Unemployment data suggest that women's employment tends to be concentrated in the low income service category (NYSDOL 2001).

Government assistance programs mitigate but do not solve the low income problem. For instance, the low number of welfare recipients in the five counties masks the extent of poverty. As in the rest of the US, these counties experienced a significant decline in the number of welfare program participants (primarily women), after the new national welfare law, Temporary Assistance for Needy Families (TANF), passed in 1996 (Table 1).[7] This law changed the conditions under which welfare could be obtained, imposed a time limit[8] and strongly em-

phasised job market participation. However, as Abelda (2000) argues, leaving welfare has not meant leaving poverty. A follow-up study of welfare leavers in Delaware county (over half of which is in the City's watershed and which is about half of the total watershed area) found continuation of poverty among the leavers (Eberhard 2000). One reason that this situation is likely to continue is that the welfare program provides temporary back-to-work benefits such as childcare for welfare leavers in order to encourage participants' entry into the labour force. Because many jobs in the counties are contingent work, the likelihood that welfare leavers will find jobs that will replace these government benefits when they run out is unlikely. Some improvement in the ability of government to help is indicated by the interesting finding that leavers were not aware of, or did not use, all the government benefits available to them (Eberhard 2000).

Despite the reduction in poverty that has been achieved through the national food stamp and national and state [9] earned income tax credit (EITC), in New York State, there remains a significant number of people, primarily working adults, who live in poverty even with these aids (Fiscal Policy Institute 2001b, Greenstein and Shapiro 1998, Golan and Nord 1998). A similar pattern of poverty, especially among single mothers, would be expected in all of the Watershed counties.

Watershed Counties' Economic Well-Being: Personal Infrastructure Expenses

Funds available for water quality protection in the watershed counties are affected not only by low income problems but also by the pressures to pay for critical personal infrastructure expenses such as transportation, housing, childcare and health. Women are not only especially likely to experience declining real income, but also to have significant access and affordability problems in these areas.

Transportation

High transport expenses result from the rural character of the counties (especially in the watershed areas) because transportation is needed both for work and childcare services. Maintaining a car is expensive, especially for low income earners.[10] Little public transportation is available, and its services are not designed to suit either commuting or childcare needs. Usually, even if a route serves a woman's work needs, it is highly unlikely that she can find childcare along the same route (NYSDOT 1999, 2000a, 2000b; interviews Penman, Daly, Gaige, Patterson, Ruiz). [11]

Childcare

The inadequacy and high cost of childcare services are barriers to work and result in a drain on family budgets in all of the five counties. All report unmet needs for all types of childcare, but especially for weekend and night shift work and in rural areas like the Watershed. (CCCG 2000, CCCS 2000, CCCU 2000)[12]. Affordability is also a problem. Studies in several of the counties found costs

per child in full time child care running at close to a fifth of the median income [13] (CCCG 2000, CCCS 2000, CCCU 2000).

The individualistic values in the US manifest themselves in the approach to childcare, emphasising individual and private sector solutions (Meyers and Gornick 2004). The unmet needs for childcare in the Watershed counties result from reliance on for-profit servers whose potential customers have low incomes. (Interviews with Cooke, Dingee, Van Brundt, and Sisco). The link between income and childcare services creates a supply problem. The problem extends into the quality of childcare, deemed inadequate by both national and local childcare experts. Both training and monitoring programs are underfunded (Meyers and Gornick 2004, and interviews Dingee, Van Brundt, Sisco, and Cooke).

Healthcare

Lack of health insurance in the US is also rooted in the individualistic values that have resulted in extensive reliance on market-based solutions that cannot be afforded by low income people. While local data are not available, the sifting of general evidence indicates a health insurance coverage problem in the five counties. The economy is characterised by groups with below average health insurance coverage (Berger, Black and Scott 1994, USBLS 2001b, c). The businesses are small, and there is a lot of contingent labour (USCB 2001c).[14] In 2000, one of the Watershed counties' (Sullivan) web sites actually advertised that most of the 47 per cent of their workforce that is part time did not have fringe benefits as an inducement to businesses to locate there (Sullivan County 2000). Women are especially likely to lack health insurance coverage because so many do part-time and temporary work; marriage to a partner with insurance can mitigate this problem.

Despite the fact that New York legislation has extended low cost health insurance coverage for the very poor and has provided a standard health insurance package for the less poor and small businesses, it is estimated that 20 per cent of New York adults, most of them working people, still do not have coverage due to ineligibility or failure to enrol (UHF 2001). The affordability of the standard package is the probable explanation. [15]

Housing

These counties have two of the three housing problems that indirectly affect watershed management: homelessness, lack of affordable housing, and delayed maintenance. Homelessness is very low in these counties, but there is concern that it will rise as federally mandated term limits to public assistance become effective (interview Powers 2001). Homelessness is rooted in lack of affordable housing, a growing problem in the five counties, with a concomitant decline in real incomes and a rise in housing prices. Rentals are not easy to obtain and many, when available, are not affordable. Almost 40 per cent of renters in these counties cannot afford Fair Market Rents (NLIHC 2001) (see Table 1). Affordability problems can lead to diminished maintenance not only for hous-

ing, but also for cars and septic tanks. One local building inspector remarked in an interview that in his experience most housing sale septic inspections failed, indicating lack of regular maintenance (interview Shultis 2000).

Watershed Counties' Economic Well-Being: Quality of Life

The rural character of these counties affects quality of life in ways that are both negative and positive for watershed management. The time needed to drive to distant work locations and necessary services reduces the time that poor people have to do home repairs for which they cannot afford to pay, or to participate in community activities. The previously mentioned inadequacy of funds for community facilities can also reduce the potential for community life.[16] However, because the watershed is dominated by small towns, community life is enhanced by the ease with which residents can get to know one another.

Watershed Counties' Economic Well-Being: Inequality Issues

The growing income inequality in these counties over the past decade presents potential problems for watershed management. Part of the increasing inequality comes from the more prosperous New York City residents buying land and housing for second homes. (Nearly 20 per cent to 30 per cent of the homes in four of the five counties are seasonal, see Table 1.) Housing prices have risen. This has affected the ability of the children of current residents to find housing and creates the possibility that future property tax increases (due to higher assessments) will drive local residents out. The pressure on the housing prices and housing availability problems, combined with the fact that the City imposes water regulations, creates an underlying tension which must be continually addressed to ensure cooperation.[17]

Racial inequality is a potential rather than a current problem. The watershed county populations are predominantly white, and Delaware county, whose area is over half of the watershed, is 95 per cent white[18]. While the proportion of racial minorities is currently low, there are possible future issues. Some of the farm labour is Hispanic migratory labour.[19] Given the history of racism in the US there could be problems in the integration of these workers into the communities. Also, the City is becoming increasingly nonwhite. Until now, the people who have negotiated with these largely white upstate communities have been white themselves. If that were to change in the future, then racial issues, such as how the watershed communities treat local minority groups, could affect future negotiations.[20]

As previously discussed, gender inequality manifested in women's low incomes and inadequacies of childcare programs contribute to the economic pressures in the watershed. Also, women's disproportionate share of household work leaves them reduced time to participate in community activities.

DISCUSSION: IMPACT OF STRATIFICATION ON NEW YORK CITY WATER QUALITY MANAGEMENT

The combination of low incomes and high personal infrastructure expenses of residents of the watershed counties affect water quality in several ways. The economic squeeze reduces the likelihood that individual households will maintain their homes, cars, septic tanks and stream banks. Overloaded septic tanks and unmaintained streams can result in pollution entering the water. Depreciated housing affects the situation indirectly through the tax base. Local households have less disposable income to spend in local businesses, which affects the local tax revenues and ability of those businesses to maintain their own environmental infrastructure. Government's ability to pay for environmental infrastructure is diminished by the low tax base. Indeed, the 1997 Memorandum required that the City repair and upgrade some of the community as well as City owned Watershed sewage treatment plants (NRC 2000). Septic tanks have been identified as a major contamination source (NRC 2000) and the initial estimate of the need to replace septic tanks was too low. Funding for septic replacement and repair was increased in the 2002 filtration deal (USEPA 2002). Streams needed reconstruction work, and investment in prevention of storm runoff was required (NRC 2000). Although residents of the New York City's watershed communities use the same water supply as those in New York City, often through wells, they had not made the necessary investments to maintain the water quality infrastructure.

New York City Policy Response

Fortunately, New York City's policy has, due in part to political pressure from watershed residents since the late 1980s, addressed these economic realties in a variety of ways. The program is complex; a 2002 estimate of funds committed or spent in the Watersheds by the City give an indication of its extent:

- $117 million for water related infrastructure through grants or loan subsidies
- $275 million on upgrade of locally owned waste water plants [21]
- $30 million for local septic tanks
- $46 million on local storm water programs
- $100 million on farm, forestry and stream management programs
- $60 million for local development (Graf 2003)
- $9.8 million for good neighbour grants to local governments (CCCD 1997)

However, so tight is the cost of living squeeze on many local residents that the communities have fought for funds from the City to finance the maintenance

of septic tanks, and have undertaken efforts to avoid maintenance costs for waste water treatment infrastructure built by the City.[22] One result is that the terms of the filtration deal of 2002 include payments by the City for septic tank maintenance as well as their construction (USEPA 2002).

It is worth noting that the City subsidises the construction and maintenance of septic tanks with specific 'septic tank dollars'. Because the communities are so hard-pressed for funds, it is important for the City that it stimulate economic development in general, both to generate goodwill and to expand the future tax base so that the communities will be better prepared to take over the sewage system maintenance responsibilities which they will acquire from the City in the future. But given the level of economic hardship, it cannot be expected that a rise in the standard of living would be applied by individuals to septic tank purchase and maintenance. Tying aid to the purchase and maintenance of the septic tanks is appropriate policy.

The City's programs also wisely recognise the need for cooperation from upstate communities and the communities' concern with their own economic future. The City not only has community liaison representatives, it also funds education on watershed issues and invests money in local economic development through a variety of grants and a loan fund. Further, the expenditure by the City on water quality infrastructure improvement and water protection has positive multiplier effect throughout the watershed. Examples include the hiring of local residents or outsiders who move to the area. However, local communities, mindful of the economic pressures on many residents, have expressed concern that strict enforcement of water regulations is keeping business away and negatively affecting their future.[23] While a study on the net impact of the agreement has yet to be made, if the City had not undertaken these infrastructure investment and community development programs, relations with the Watershed communities would have been much more contentious.

While New York City's watershed management policy does make upstate economic well-being a goal and commits funding to that purpose, the important aspects of economic well-being discussed here that affect the capacity of individuals and local governments to protect water quality are not addressed. These include affordable housing, rising property taxes, health insurance, childcare and equal opportunity. Unfortunately, due to individualistic social values in the US, national policies do not fill the gap. Instead, there is a tendency to rely on private sector solutions to housing, childcare and health care problems. In recent decades income tax cuts have been justified as rewarding individual effort and having less reliance on government. The devolution of responsibility for programs to local governments has been similarly rationalised as reducing an allegedly undesirable dependence on a national bureaucracy. As a result more programs are financed by relatively regressive local taxes (property) and fees. Also, dialogue in the US has increasingly assumed that inequality of opportunity (whether by gender or race) is a problem of the past.

New York City and other US watershed managers should not only be aware of how social policies ultimately affect water quality protection, but should also be aware of approaches to those problems that differ from those in the US. European social policies, like their environmental policies, derive from values that are more community oriented than those in the US. As a result they are more likely to be national in scope and nationally financed than the fragmented approach in the US. In housing, European governmental support for large non-profit sectors have the same effect (Meyers and Gornick 2004, McCilwain 2003, McCrone and Stephens 1994, Rothenberg 1992). The broader approach means that necessary services can be provided even in poor localities.[24] However, this analysis is directed particularly at the original members of the European Union. As the Union has expanded, it has acquired more diverse members with different environmental and social problems. For instance, in central and eastern Europe, only a quarter of the populace relies on waste water treatment plants (EEA 2003), which means that in those countries, low individual and community incomes have an impact on the provision of water quality infrastructure such as septic tanks.

CONCLUSIONS

New York City's programs recognise many of the challenges to water quality created by economic stratification. However, the parts of the counties outside the watershed experience the same problems, and do not have aid from New York City to improve their water infrastructure. The lessons for the country at large are serious ones. This rural area is not unique in its economic problems. Other areas of the country are experiencing similar problems of decaying environmental infrastructure. The combined annual under-funding of drinking and wastewater infrastructure for the nation as a whole is estimated at $23 billion per year, and Federal funding has not expanded to meet these needs (ASCE 2003). It is to be expected that these unmet needs are especially severe in low income communities where the temptation to let maintenance slide is great.

Expanded Role for Watershed Managers and Policy Makers

Particularly in the long run, watershed management is rooted in economic development that provides economic well-being throughout the community so that people have enough income to maintain their homes, cars and septic tanks and can support local businesses and therefore the tax base. For the same reasons, access to affordable health care and childcare affect the ability of communities to afford water protection. In places where it is economically viable, mass transportation can, indirectly, be a water quality issue, because it would lower the cost and time of transport and leave people with more money and time to spend

on water related infrastructure. Equal opportunity in economic development is important in order to nourish the kind of community relations that will support cooperation to address water quality problems. An integrated, interactive community is more able to rally together to provide volunteers, raise needed local funds, and protect itself from outside threats to its water quality.

Watershed policy makers and managers should recognise that many of these economic problems cannot be solved solely at the local level. In fact, reliance on local programs to solve problems that are national in scope like health care and affordable housing can be undermined by competition as local governments offer lower taxes to attract business; the funds to support such programs may not be available as a result. Communities which draw on water from other jurisdictions cannot rely on their local policies to address economic stratification issues. National and state programs such as the EITC, food stamps, and TANF indirectly help preserve water quality by supporting spending and tax bases in local communities. State and national financing of health care, childcare and affordable housing have an impact on the amount of money that individuals and local governments have to spend on water quality infrastructure. Anti-discrimination programs, which help people both gain income and protest pollution, also require national support. International boundaries present yet another level of challenge.

Effective watershed management is tied to equitable economic development for the many reasons discussed here. Although these issues do not cross the desk of watershed managers on a daily basis, some of the important problems they face are rooted in the nature of the economic development of their communities. Long term success in maintaining water quality calls for an expanded scope in watershed management and policy. It is in our long-run interest for managers and policy makers to educate themselves about, and contribute to the discussion of, these economic development issues at the local, state and national levels, and to be open to solutions considered in other parts of the world such as Europe.

NOTES

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[1] High income users create a wide variety of water quality problems such as purchase of vehicles that use a lot of fuel per mile, but problems due to abundance of resources are not the focus of this article.

[2] Economists discuss the option value of having desirable aspects of environmental quality (see discussion in Goodstein 2002) and Siebenhuner discusses our valuing of the environment as directing us towards sustainable economic development choices (Siebenhuner, 2000).

[3] In the early nineties a voluntary agreement to protect the water supply to be overseen by a Watershed Agricultural council (WAC) was made with local farmers. This agreement became integrated into the MOA in 1997.

[4] The lower part of New York City's reservoir system the east of Hudson watershed, is so close to the City and so developed that filtration of its water is necessary. It is therefore not discussed in this paper.

[5] The region around reservoirs is properly called a watershed. A watershed includes all of the tributaries feeding the reservoirs and the land that affects those tributaries as well as the reservoirs. The Catskill mountain part of the watershed includes part of each of five contiguous New York State counties (Delaware, Greene, Schoharie, Sullivan and Ulster).

[6] Studies of underemployment made for some of the counties suggest that many workers feel the pressures of their low incomes. In a study designed to identify available workers in a region beyond those whose presence is indicated by the unemployment rate, it was found that about four times as many workers as were unemployed were interested in changing jobs for higher income. (Pfresources 1999, Surdey 2000a, b).

[7] Local experts gave varied reasons for the decline, including introduction of person-oriented management in one county, better transition to work aid and time-limit inspired departures by low benefit recipients as a precaution against greater future needs.

[8] New York does have a constitutionally guaranteed safety net program for those encountering the limit.

[9] New York State is among the most generous states in providing a state EITC.

[10] In 1997 the annual cost of a car per 10,000 miles was over $5000 a year (NYS 2000 Table M-20 p 470). The costs would be less in rural areas, but it would still be a significant per cent of available income for many. A full time job at the minimum wage provides only about $10,300 per year and a job at the average weekly wage in these counties, if available full time, would bring in a gross income of only around $20,000 before taxes.(NIRG 2000, p.97).

[11] The economics of public transportation explains this pattern. Economies of scale are a determinant of the cost of public transport. Vehicles are expensive and routes with many riders are more cost effective (interviews Penman, Daly, Gaige, Patterson).

[12] Generally women are disproportionately more likely to end up with shifts that are incompatible with available childcare because of low seniority, sometimes due to interruption of work to take care of children (Kahn and Blum 1998). Even when workers patch together formal and informal services (sometimes leaving children alone), sustainable development goals are not achieved because of the impact of the stress of juggling child-care services for parents and living in the patchwork system for children. For children irregularities such as changes in childcare providers, odd hours, and being awakened to be taken home are distressing.

[13] In one county it can be 30% of the income per child for those families just over the subsidy guideline.

[14] My calculations based on data in the 1997 US Census of Women and Minority owned businesses.

[15] The package was initially designed to serve small business and the rates reflect that conception. For instance, calculating the cost of the package in one watershed county as a per cent of the upper income limit for the insurance, revealed that it was over 10% of

that pretax income (around $20,000). It would be a higher per cent of post-tax income and for those with lower incomes. In addition, the co-payments of $20–25 are high for low income people.

[16] At a watershed conference arranged by the Catskill Watershed Corporation for watershed area governments and businesses (attended by the author), one presenter described with enthusiasm the increase in community activity that arose after the building of a new community centre.

[17] The author has encountered expressions and discussions of this resentment in the process of formal interviews and less formal travel throughout the watershed.

[18] Analysis of the 2000 Census shows the counties to range from 88% to 95% white; the watershed contains the rural part of the watershed, not the urbanised areas closer to the City that contain minority groups.

[19] At a watershed conference held to explore the business needs of the local economy, the suggestion was made that Spanish lessons would be useful to facilitate communication with migrant labour.

[20] For such small areas with such low minority populations, data on racial inequality is sparse. Very indirect indicators such as a strong correlation between the per cent of the population receiving TANF and per cent minority suggest inequality of opportunity.

[21] The City spent or committed an additional $200 million on waste water plants in the watershed owned by the City.

[22] The author observed these struggles in local watershed meetings and in conversations with local supervisors.

[23] The author has heard this concern expressed in a variety of interviews with local supervisors and with community residents in travels around the watershed. Furthermore during informal discussions with New York City watershed officials, they have reported hearing these arguments.

[24] Of course class pressures can lead to lower allocation of national funds to poorer areas; that is another topic.

REFERENCES

Abelda, Randy. 2001. **'**Welfare-to-Work, Farewell to Families? US Welfare Reform and Work/Family Debates', *Feminist Economics* 7(1): 119–35.

(ASCE) American Society of Civil Engineers. 2003. 2003 Progress Report. http://www.asce.org/reportcard/index.cfm?/reaction=full&page=6 downloaded 30 Dec. 2003.

Baldwin, S. (ed.). 1990. *Quality of Life: Perspective and Policies*. London: Routledge.

Berger, M.C., Black, D.A. and Scott, F.A. 1994. Research Summary 'Measuring the Uninsured by firm size and employment status: variation in health insurance coverage rates (part I).Lexington, KY: Carolyn Looff and Associates under contract to he U.S. Small Business Administration online http://www.sba.gov/adv/research/rs146.html accessed on 12 Nov. 2001

Blau, Francine D., Ferber, Marianne A. and Winkler, Anne E. 1998. The *Economics of Women, Men and Work*, 3rd edition. Upper Saddle River, N.J.: Prentice Hall.

Borjas, George J. 1995. 'Ethnicity, Neighborhoods, and Human-Capital Externalities', *American Economic Review*, 85 (3): 365–90.

Breen, Nancy. 2002. 'Social Discrimination and Health: Gender, Race and Class in the United States'. In *Engendering International Health: The Challenge of Equity*, edited by Gita Sen, Asha George and Piroska Ostlin, Chapter 9, pp. 223–56. Cambridge, Mass.: MIT Press.

Byron, Ian and Curtis, Allan. 2002. 'Maintaining Volunteer commitment to Local Watershed Initiatives', *Environmental Management* 30(1): 59–67.

(CCCD) The Catskill Center for Conservation and Development. 1997. *Summary Guide to the Terms of the Watershed Agreement*. Arkville, NY: the Catskill Center for Conservation and Development.

(CCCG) Child Care Council of Greene County. 2000. Child Care Community Needs Assessment Greene County. Hudson, NY: Child Care Council of Columbia & Greene Counties.

(CCCS) Child Care Council of Sullivan County, Inc. 2000. 2000 Sullivan County Childcare Needs Assessment. Liberty, NY: Sullivan County Child Care Council, Inc.

(CCCU) Child Care Council of Ulster County. 2000. Child Care Community Needs Assessment Ulster County. Kingston, NY: Child Care Council of Ulster County.

(EEA) European Environment Agency. 2003. 'Europe's Environment: The Third Assessment', (Environmental assessment report No 10)' http://reports.eea.eu.int/environmental_assessment_report_2003_10-sum/en/kiev_sum_en.pdf downloaded 28 Jan. 2005

Eberhard, John. 2000. *The Changing Face of Welfare in the 1990's: A Rural Study of Poverty & Welfare Reform Delaware County, NY*. Delhi, NY: Delaware County Department of Social Services.

Edin, Kathryn and Lein, Laura. 1997. *Making Ends Meet*. New York: Russell Sage Foundation.

Edwards, Sally M.; Edwards, Terry D. and Fields Charles B. 1996. *Environmental Crime and Criminality*. New York: Garland Publishing. Inc., pp. 245–62

Fallick, Bruce C. 1999. 'Part-time Work and Industry Growth', on line at (USBLS) United States Bureau of Labor Statistics, http://www.bls.gov/opub/mlr/1999/03/artexc.htm downloaded 12 Jan 2004

Fiscal Policy Institute. 2001a. 'Proportion of New York county TANF caseloads reaching the federal family assistance time limit', on line at http://www.fiscalpolicy.org/ESJTimeLimits.pdf

Fiscal Policy Institute. 2001b. 'The Decade of Boom: A Bust for Most New York Workers and Their Families'. Albany, NY: Fiscal Policy Institute, on line at http://www.fiscalpolicy.org/

Galusha, Diane. 1999. *Liquid Assets. A History of New York City's Water System*. Fleishman's, New York: Purple Mountain Press

Golan, E. and Nord, M. 1998. 'How Government Assistance Affects Income', *Food Review*, January–April 1998. Washington, D.C.: U.S. Department of Agriculture.

Goodstein, Eban S. 2002. *Economics and the Environment*, 3rd edition. New York: Wiley.

Graf, Jeff. 2003. Program Manager Community Planning. New York City Department of Environmental Protection US July 2003, letter detailing spending.

Greenstein, Robert and Shaprio, Issac. (1998). 'New Research Findings on the Effects of the Earned Income Tax Credit', on line at http://www.cbpp.org/311eitc.htm downloaded 18 Aug. 2001.

Griffiths, Martin. 2002. The *European Water Framework Directive: An Approach to Integrated River Basin Management*. Brussels: the European Water Association http://projects.dhi.dk/waterdir/Projects/WFD%20publications.htm downloaded 28 Jan. 2005, p. 30.

(HR&A) Hamilton, Rabinowovitz & Alschuler, Inc. 1998. *West of Hudson Economic Development Study for the Catskill Watershed Corporation*. Saratoga, New York: Hamilton, Rabinowovitz & Alschuler, Inc.

Hoffman, Joan. 2000a. 'Roots: Indicator of Sustainable Development for New York City', *Social Indicators Research* 52(2): 95–134.

Hoffman, Joan. 2000b. 'Sustainable Economic Development: A Criminal Justice Challenge for the 21st Century', *Crime, Law and Social Change* 34 (3): 275–99.

Hyatt, William D. and Trexler, Tracy L. 1996. 'Environmental Crime and Organized Crime: What Will the Future Hold?', in Sally M. Edwards, Terry D. Edwards, and Charles B. Fields, eds., *Environmental Crime and Criminality*. New York: Garland Publishing. Inc., pp. 245–62.

Kahn, P and Blum L.M. 1998 (November/December). 'Not just 9 to 5: the Problems of Non-Standard Working Hours', in *Working USA*. Armonk, N.Y.: M.E. Sharpe Inc., pp. 51–9.

Lovell, Vicki and Hartman, Heidi. 2001. 'Increasing Economic Security for Low-Wage Women Workers', in Richard Kazis and Marc S. Miller, eds., *Low Wage Workers in the New Economy*. Washington D.C.: the Urban Institute Press.

McIlwain, John. 2000. 'Housing Europe's Workforce' http://www.smartgrowth.net/Issues/sg_Issues_Housing_fst.html downloaded 7 Jan. 2005.

McCrone, Gavin and Stephens, Mark. 1994. 'Housing Policy in a European Perspective.' www.jrf.org.uk/knowledge/findings/housing/H129.asp downloaded 31 Jan. 2005

Meyers, Marcia K. and Gornik, Janet C. 2004. 'The European Model that We Can Learn From: How Other Nations Support Families that Work', *The American Prospect*, November http://www.thirdworldtraveler.com/Europe/European_Model_Families.html downloaded 29 Dec. 2004.

(NLIHC) National Low Income Housing Coalition. 2001. *Fair Market Rent for Existing Housing*. http://www.nlihc.org/cgi-bin/oor2000.pl?getcounty Washington D.C.: National Low Income Housing Coalition.

(NRC) Nation Research Council. 2000. *Watershed Management for Potable Water Supply*. Washington D.C.: National Academy Press.

(NYCDEP) New York City Department of Environmental Protection. 2002. Filtration Avoidance Determination.

(NYSDOL) New York State Department of Labor. 2001. Characteristic of Unemployment Insurance Beneficiaries for Ulster, Delaware, Greene, Schoharie and Sullivan counties. Albany, N.Y.: NYS Dept of Labor.

(NYSDOT) New York State Department of Transportation. 1999. *Rules and Regulations, Part 975: Statewide Mass Transportation Operating Assistance Program*. Albany, NY: New York Department of Transportation.

(NYSDOT) New York State Department of Transportation. 2000a. *On Public Transportation Assistance Programs in New York State*. Albany, NY: New York Department of Transportation.

(NYSDOT) NewYork State Department of Transportation. 2000b. *Annual Report on Public Transportation Assistance Programs in New York State*. Albany, NY: NY State Department of Transportation.

Nierenberg, Danielle. 2002. *Correcting Gender Myopia: Gender Equity, Women's Welfare and the Environment*. World Watch Paper 161. Washington D.C.: Worldwatch Institute.

Perotti, Roberto. 1993. 'Political Equilibrium, Income Distribution and Growth', *Review of Economic Studies* 60: 755–76.

Pfresources. 1999 (October). 'Verification of the New York State Hudson Valley Region Workforce'. Dallas, TX: Pfresources.

Rothenberg, David. 1992. 'Individual or Community? Two Approaches to Ecophilosophy in Practice', Environmental Values 1: 123–32.

Siebenhuner, Bernd. 2000. 'Homo Sustinens: Towards a New Conception of Human for the Science of Sustainability', *Ecological Economics* 32 (1): 15–25.

Sirianni, Carmen and Negrey, Cynthia. 2000. 'Working Time as Gendered Time', *Feminist Economics* 6(1): 59–76.

Sullivan County http://co.sullivan..ny.us/content/resources/nyslinks.asp downloaded 18 July 2000

Surdey, F. 2000a. An Analysis of the Ulster County Employer Survey. Albany: Research and Statistics Division, New York State Department of Labor (December 2000).

Surdey, F. 2000b. An Analysis of the Sullivan County Employment Survey. Albany: Research and Statistics Division, New York State Department of Labor (December 2000).

Tietenberg, Thomas H. 2000. *Environmental and Natural Resource Economics*, 5th edition. New York: Addison Wesley.

Todaro, Michael P. and Smith Stephen C. 2002. *Economic Development,* 8th edition. New York: Addison Wesley.

(UHF) United Hospital Fund, 'Coverage Trends Among New Yorkers, 1995–99', New York: United Hospital Fund reported on line at http://www.uhfnyc.org/archive/press/pr010816.html on 17 Nov. 2001.

(USBLS) United States Bureau of Labor Statistics 2001a. http://146.142.4/cgi-bin/surveymost accessed 5 Aug. 2001.

(USBLS) United States Bureau of Labor Statistics. 2001b. Temporary workers health insurance, coverage online at *http://stats.bls.gov/news.release/conemp.t09.htm* accessed on 12 Nov. 2001

(USBLS) United States Bureau of Labor Statistics. 2001c. Employed contingent and noncontingent workers and those with alternative and traditional work arrangements by health insurance coverage and eligibility for employer-provided pension plans. http://www.bls.gov/news.release/conemp.t09.htm accessed 15 Sept. 2001.

(USBLS) United States Bureau of Labor Statistics. 2001d. Contingent and alternative work arrangements. http://www.bls.gov/news.release/conemp.nr0.htm downloaded 12 Jan. 2004.

(USCB) United State Census Bureau. 2001a. 2000 census data on line http://quickfacts.census.gov/qfd/states/36000.html Sept. 2001.

(USCB) United State Census Bureau. 2001b. 1990 census data on line http://sasquatch.library.orst.edu/cgi-bin/buildit2?filenam= Sept. 2001.

(USCB) United State Census Bureau. 2001c. 1997 Census of Women and Minority Owned Businesses http://www.census.gov/epcd/mwb97//NY.html accessed 15 Aug. 2001.

(USCB) United State Census Bureau. 2001d. How the census bureau measures poverty. [online] http://www.census.gov./hhes/poverty/povdef.html accessed 20 Aug. 2001.

(USEPA) United States Environmental Protection Agency. 2002. New York City Filtration Avoidance Determination. Washington D.C.: United States Environmental Protection Agency.

(USEPA) United States Environmental Protection Agency. 2003. National Water Quality Inventory. 2003 http://www.epa.gov/305b/2000report/

Wismer, Susan. 1999. 'From the Ground Up: Quality of Life Indicators and Sustainable Community Development', *Feminist Economics* 5(2), 109–14.

Wondolleck, Julia M. and Yaffee, Steven L. 2000. *Making Collaboration Work*. Washington D.C.: Island Press.

Interviews

Transportation(2001)

Penman, Ann. Family Services, Ulster County.

Daly, Ed. Community Action Agency, Greene County.

Gaige, Janet. Schoharie County Transportation Services.

Patterson, Jane. Greene County: Planning.

Cummings, Jim. New York State Passenger Transportation Division.

Ruiz, Cynthia. Ulster Count Transportation Service, Housing (2001).

Powers, Terry: Office of Temporary Disablity Services, New York State, Childcare (2001).

Directors of county child care councils of Delaware, Schoharie, Sullivan and Ulster counties (Nancy Dingee, Karen Cooke, Lisa Van Brundt and Nancy Sisco).

Building Inspector Shultis, Town of Woodstock 2000.

Town Supervisors (2000, 2001, 2002).

Towns of Andes, Bovina, Colchester, Delhi, Denning, Gilboa, Halcott, Hardenburgh, Jewett, Meredith, Middletown, Neversink Olive, Prattsville Roxbury, Shandaken Stamford, Walton, Windham, Woodstock.