The health co-benefits of a more sustainable society

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> CHAPTER SEVEN: SIGNS OF HOPE: NEW AND EMERGING CONCEPTS AND PRACTICES THAT MOVE US TOWARDS A HEALTHIER, MORE SUSTAINABLE AND MORE JUST FUTURE
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7.3 The health co-benefits of a more sustainable society

The health co-benefits of a more sustainable society are not limited only to the essentially protective function of minimising the harm to health from global ecological change, important though that is. What is often overlooked in all of the concern raised about the ecological crisis is that there are very large health costs to our current way of life, and thus very large potential health benefits from a shift to a more sustainable society. In fact, whether we think of the shift to a more sustainable society and community as having health co-benefits, or conversely that in creating healthier communities we can have sustainability co-benefits doesn't matter; what matters is the considerable overlap in a large number of policy areas of importance to health and sustainability.

Among the key policy areas where there are significant health and sustainability co-benefits are energy, agriculture and food, and urban design and transportation. Each of these is discussed briefly below; Haines et al (2007) also provide an analysis of the health impacts of policies in these same areas. The application of a health and sustainability 'lens' to public policy in these and many other areas of policy would result in the creation of healthier public policies and healthier societies and communities.

7.3.1 Energy, health and sustainability

Smith et al (2012) note that

> *"Despite providing significant benefits for human health, energy systems also negatively affect global health in major ways today, causing directly perhaps as many as five million premature deaths annually and more than 5% of all ill health (measured as lost healthy life years). Air pollution from incomplete combustion of fossil fuels and biomass fuels is by far the single major reason that energy systems negatively affect global health, although ash, sulfur, mercury, and other contaminants in fossil fuels also play a role. Effects on workers in energy industries are the second biggest health impact globally."*

A full examination of the health impacts of the entire energy cycle (exploration, extraction, transportation, processing, use and disposal) for all forms of energy are beyond the scope of this report, but several useful summaries have recently been published (Holdren and Smith, 2000; Smith et al, 2012; Smith et al, 2013) as well as a series on energy and health in the *Lancet* in 2007 (Haines, 2007). The major health impacts include:

> ***Energy is a global health issue***
>
> *"the direct effects of energy systems alone exceed the global health impact of most other risk factors except malnutrition, rivaling the global impacts of tobacco, alcohol, and high blood pressure. The vast part of the direct impact comes from the poor management of fuel combustion. Clearly, energy is a global health issue"*
>
> Smith et al, 2013

- Occupational health impacts of extraction and use of energy, especially in the mining and use of coal, but also other fossil fuels. (There are of course occupational health impacts of all energy use, including the manufacture of solar photovoltaic panels - which require the use of toxic metals and gases – and the installation of solar thermal panels or insulation.)
    - Smith et al (2013) report that more than 100,000 coal miners have been killed in mining accidents worldwide since 1900, and another 200,000 have died from pneumoconiosis.
- Environmental health impacts (air pollution, water and soil pollution from mining and transportation, greenhouse gas emissions etc.) coming from extraction, transportation, processing, use and disposal of energy; again, while fossil fuels feature prominently, there are for example significant environmental and social health impacts from dam construction for hydro-electric energy, including loss of good farmland, population displacement and risks arising from infectious disease and dam failure – Smith et al, 2013).
- The large cardiovascular and respiratory health impacts of air pollution from the combustion of fossil fuels in power generation, industrial activity, space and water heating, transportation and other uses.
    - Smith et al (2013) report that energy use accounts for roughly 80% of particulate matter (PM) air pollution world wide, and that in 2010 PM pollution resulted in 3.1 million premature deaths.
- Very large numbers of death and injuries resulting from transportation, especially from automobile and motorcycle use; public transportation is far safer per passenger mile, as is cycling.

These health impacts are very costly for society. The health costs of coal-fired electricity in the US alone range from $62 billion to $523 billion annually, which at the upper range is several times the cost of producing electricity (Smith et al, 2013)

While precise comparisons of energy systems and their health impacts are difficult, numerous studies have reached similar conclusions. For example, in a comparison of several forms of electrical generation (fossil fuels including coal, lignite, oil and gas; nuclear and renewable – both solar photovoltaic and wind) across the full fuel chains (including fuel extraction, transport processes, waste disposal, and plant construction and decommissioning), Krewitt, Hurley, Trukenmüller and Friedrich (1998) concluded:

> *"risks from the use of solid and liquid fossil fuels are at the upper end [of public health risk], while electricity generation from nuclear and wind are options with a relatively low risk per*

unit electricity generation . . . The coal fuel chain clearly shows the highest occupational risks".

Smith et al (2013) note that

"Overall the health impact of solar power is likely to be far less than that of any of the fossil fuels"

and that

"Overall, the population health impacts [of wind power] appear to be far lower than for equivalent energy generation by fossil fuel combustion"

while

"[energy] conservation is an efficient, economical, healthful, and environmentally friendly approach to energy use."

A side benefit of conservation and renewable energy systems is that they are usually more labour intensive and more local, thus generating local employment and strengthening the local economy; this can be particularly important in lower income communities (see Text Box)

Clearly, there are very significant health benefits in a move away from fossil fuel energy use, with conservation and renewable energy systems offering a much healthier future. In addition to preventing the current large health impacts and high economic costs of current patterns of energy use, there are in particular health benefits from a less energy dependent and inefficient agri-food system, and from the reduction of motor vehicle use through improved urban design and public transportation systems, as discussed below.

Job Creation in conservation and renewable energy systems

"Localized use of energy efficiency and renewable energy produce jobs in all parts of a country and not just where the conventional energy reserves are located. This provides a more equitable employment environment and one that is permanent and not cyclical.

According to the World Watch Institute's report *Renewables 2005*, more than 1.7 million direct jobs were created worldwide from renewable energy manufacturing, operations and maintenance in 2004. For example, the wind industry has created 45,000 jobs in Germany and 20,000 in the U.K. offshore wind industry.

Analysis by the Pembina Institute indicates that the "employment created from low-impact renewable electricity would be comparable to or greater than that created by an equivalent capacity of fossil-fuel based generation."

Many of these jobs would be local or regional and small-scale. There is employment potential in rural and remote locations, including First Nation communities. Biomass energy, for example, gives farmers another form of income by allowing them to add an energy crop."

http://www.pembina.org/re/benefits

7.3.2 Agriculture, food, health and sustainability

As noted earlier, our current food system provides a diet that is high in animal protein, low in fibre, highly processed, and based on an environmentally harmful agricultural system. If global food production is to be dramatically increased (to respond to estimated population growth and to meet Millenium Development Goals for the worldwide reduction of hunger and malnutrition) while environmental harm is reduced, we need a very different diet and a very different agricultural system. Foley et al (2011) propose four key strategies:

- Stop expanding agriculture: "*Slowing (and, ultimately, ceasing) the expansion of agriculture, particularly into tropical forests, will be an important first step in shifting agriculture onto a more sustainable path."*
- Close yield gaps: "*Much of the world experiences yield gaps where productivity may be limited by management. There are significant opportunities to increase yields across many*

parts of Africa, Latin America and Eastern Europe, where nutrient and water limitations seem to be strongest. . . . Closing yield gaps could substantially increase global food supplies."

- Increase agricultural resource efficiency: There are "*many opportunities to improve the water and nutrient efficiency of agriculture without reducing food production. Targeting particular 'hotspots' of low efficiency, measured as the disproportionate use of water and nutrient inputs relative to production, could significantly reduce the environmental problems of intensive agriculture."*
- Increase food delivery by shifting diets and reducing waste: "*reducing food waste and rethinking dietary, bioenergy and other agricultural choices could substantially improve the delivery of calories and nutrition with no accompanying environmental harm."*

They estimate that implementing these four strategies together could "*increase global food availability by 100–180%, meeting projected demands while lowering greenhouse gas emissions, biodiversity losses, water use and water pollution."*

There are important health benefits to such an approach. Not only would land, soil, water and biodiversity be conserved and greenhouse gas emissions and pesticide and herbicide use drop, but a shift to a low meat or vegetarian diet would have a number of direct health benefits, as noted earlier (McEvoy, Temple and Woodside, 2012).

Nationally, the growth of organic agriculture and local food production systems has reached the point where they are becoming commonplace - although too often still financially inaccessible to lower income groups, which is a major challenge. Major national organisations such as Food Secure Canada, Canadian Organic Growers and the Canadian Association for Food Studies work through their members and networks to pursue policies and actions and to undertake research congruent with the four strategies outlined above – see Text Box. Not surprisingly, many public health staff, especially community nutritionists, are very involved both at the national level and even more so at the local level.

At a local level, many groups and some local governments have been working to create sustainable local food systems that contribute to food security, support healthy diets and strengthen community. The Toronto Food Policy Council, which was established by City Council in 1989 as part of its Healthy Toronto 2000 initiative, was the forerunner of many other similar organisations across the country. For example, the Mobile Food Market project in Halifax, initiated last summer, has the city, in collaboration with the Ecology Action Centre, provide one of their Metro buses for delivery

Food Secure Canada

. . . is a pan-Canadian alliance of organizations and individuals working together to advance food security and food sovereignty.

Food Secure Canada is committed to:

Zero Hunger. All people at all times must be able to acquire, in a dignified manner, an adequate supply of culturally and personally acceptable food.

A Sustainable Food System. The production and consumption of food in Canada (harvesting, processing, distributing, including fishing and other wild food harvest), must maintain and enhance the quality of land, air and water for future generations, and provide for adequate livelihoods of people working in it.

Healthy and Safe Food. Safe and nourishing foods that are free of pathogens and industrial chemicals must be available. No novel food (genetically modified organisms - GMOs) may enter food system without independent testing and monitoring.

http://foodsecurecanada.org/who-we-are/what-we-do

of healthy foods into low-income neighborhoods once a week (www.hal;ifax.ca/council/agendasc/documents/150804ca1141.pdf).

Local action for sustainable and healthy food and agriculture is widespread in Canada, and indeed globally, and this movement represents a real sign of hope, although as is so often the case, the movement finds itself battling national and global corporate interests, and national governments whose policies too often favour the health of corporations over the health of people and the environment. Thus, the public health community needs to remain vigilant about large scale corporate interests and international trade agreements such as the Trans-Pacific Partnership (TPP) agreement. Public health advocates argue that the TPP agreement will have significant public health implications, as it has the potential to restrict public policy decisions with population health impact (Ruckert, Schram & Labonte, 2015). Transnational corporations will have the power to sue the Canadian government over public policy decisions that may interfere with their corporate interests and investments. The authors call for a more transparent process during trade negotiations including the applications of health impact assessments.

7.3.3 Urban design, transportation, health and sustainability

There has been a remarkable growth in recent years in the awareness of the health impacts of urban design, and specifically the health impacts of urban sprawl. The first book on the topic (Frumkin, Frank and Jackson, 2004) identified a wide range of health impacts of urban sprawl, with chapters devoted to air quality, physical activity, injuries and deaths from traffic, water quantity and quality, mental health, social capital and the health concerns of special populations (seniors, children, people with disabilities etc). Indeed, they pointed to the health benefits of 'Smart Growth' (one of the key urban development solutions to urban sprawl) in quite dramatic terms (see Text Box).

Smart Growth - A medical miracle?

"At its best, Smart Growth is like a medicine that treats a multitude of diseases - protecting respiratory health, improving cardiovascular health, preventing cancer, avoiding traumatic injuries and fatalities, controlling depression and anxiety, improving wellbeing. In the medical world, such an intervention would be miraculous. In the worlds of land use and transportation, it is a thrilling, and attainable, opportunity."

Frumkin, Frank and Jackson, 2004

To this list they might have added the health impacts of climate change, because urban sprawl is a very energy inefficient urban form, requiring as it does the use of a car for many of the daily activities of life, and thus suburban dwellers contribute disproportionately to climate change and its health impacts. For example, a study of residential building-related and auto-related CO_2 emissions in Toronto (VandeWeghe and Kennedy, 2007) found that average GHG emissions per capita were 6.42 tonnes in the central core and 7.74 tonnes in the surrounding areas. This was due to higher automobile use in the suburbs, with GHG emissions of 3.80 tonnes per capita, compared to 1.88 tonnes in the core, which more than offset the somewhat higher residential building related emissions in the core (4.41 tonnes v 3.88 tonnes per capita). When further disaggregated, the results are even more dramatic, with average emissions in the ten highest-emitting census tracts (all of them outside the central core) of 12.3 tonnes per capita compared to 3.6 tonnes per capita for the ten lowest-emitting census tracts, nine of which are in the central core.

Of particular note are the adverse impacts on mental health and social capital, which while under-researched in comparison with air quality and physical inactivity, are nonetheless of great interest, because the implications are that there may be mental and social health benefits of more dense, mixed 'human scale' land use urban form. For example, a daily commute each way of one

hour amounts to 40 hours per month – an entire working week. If people were able to live near where they work, and get there easily by walking, biking or on a bus, not only would they be more physically active, but they would have more time for family and community activities and for leisure and recreation.

Since the publication of the book by Frumkin, Frank and Jackson, additional research has strengthened the evidence of the health impacts of urban design, and there is a growing body of evidence on the health benefits of improved urban design (see for example Healthy Canada by Design, an ongoing collaborative supported in part by the Canadian Partnership Against Cancer, which focuses primarily on the impacts of urban design on physical activity and obesity - https://hcbd-clasp.com).

As with energy policy and food policy, there are also important benefits in terms of job creation from an enhancement of public transport, biking and walking. A recent report for WHO Europe (2014) examined the job opportunities that would result from improving public transport, cycling and walking. For cycling alone, more than 75,000 jobs could be created in selected European cities (just one city per country) if they achieved the same level of cycling as does Copenhagen; in addition, 10,000 deaths a year could be avoided due to the health benefits of cycling. Moreover, the jobs created would be local and across a broad range of jobs.

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In short, a more environmentally sustainable way of life brings with it many health benefits.

- While energy conservation (often overlooked, but our best alternative 'supply' of energy) and renewable energy are not without health impacts, those impacts are generally significantly less than those associated with fossil fuel use, and may also bring some benefits in terms of mental and social wellbeing.
- A low meat or vegetarian diet would not only bring many health benefits but would reduce the intensity and considerable environmental impact of the current agricultural system (Gunderson, 2012).
- Designing urban settlements in ways that are more ecologically sustainable has a large number of beneficial impacts on physical, mental and social wellbeing.
- There are also important indirect health benefits of many of these more sustainable policies and practices resulting from the creation of large numbers of local jobs with a wide range of job skills needed (see for example Harden-Donahue & Peart, 2009; Hazell, 2009; Shuman, 2012; Jones and Conrad, 2008).

The potential benefits to mental and social wellbeing are often overlooked. For example, local food production, particularly in the form of community gardens, can bring together people of diverse backgrounds and ages, helping to build social capital. Good public transport also brings people together – a former Mayor of Toronto, John Sewell, once called the TTC "the great democratiser" – while time not spent commuting due to people living near where they work increases the time available for family, community and leisure.

Thus public policies and community and societal actions that move us in the direction of a more sustainable society in the areas of energy, transportation, urban planning, architecture, agriculture, fisheries, food and many other policy areas are in fact healthy public policies.

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