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Citation: 21 Colo. J. Int'l Envtl. L. & Pol'y 231 2010

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Articles

ENERGY JUSTICE AND SUSTAINABLE DEVELOPMENT

Lakshman Guruswamy, Ph.D.*

ABSTRACT

Sustainable Development (“SD”)—an expression of distributive justice—is the foundational premise of international energy and environmental law. It posits that international answers to environmental and energy problems cannot be pursued as independent and autonomous objectives but must be addressed within the framework of economic and social development. SD has been politically institutionalized in the Millennium Development Goals and a plethora of significant international instruments. Perhaps more importantly from a legal standpoint, SD is unequivocally codified, in the most widely accepted international energy and environmental treaties. This Article affirms the importance and continuing applicability of SD to the “other” third of the world afflicted by energy problems who live on less than a dollar or two a day. Two-thirds of the world, those in developed and advanced developing countries, are high energy (fossil fuel) users who are responsible for problems of global warming. By contrast, the primary energy relied on by the “other” third of the world, numbering around two billion peoples, is biomass-based fire. The kind of fire they rely upon fails to supply the majority of their basic energy needs. These fires also cause indoor pollution leading to over a million and a half premature deaths per year, primarily of women and children. However, the last five to ten years have witnessed the growth of a different worldwide

* Director, Energy Justice Conference; Nicholas Doman Professor of Law, Director for the Center for Energy and Environmental Security, University of Colorado at Boulder. This Article relies upon and reproduces sections of the authors: *Energy Justice* in GLOBAL WARMING READER (William Rodgers ed. 2010).

movement concerned with global warming and climate change. The singular focus of the climate change movement is the reduction of carbon dioxide emissions. Unfortunately, the objectives of carbon dioxide reduction and SD can and do diverge. Despite a ritualistic bow to SD, the global warming movement has generally ignored the energy oppressed poor ("EOP"). They have done so because the EOP use hardly any fossil fuels and their carbon dioxide emissions are less than negligible. Instead, climate change and global warming advocates and decision makers have concentrated their attention only on high energy users in the developed world, and advanced developing countries like China and India. The other third of the world—the "EOP"—have been ignored. This Article explains why energy justice ("EJ"), which provides the philosophical and jurisprudential underpinnings of SD, demands that the developed and high energy world should act to address the condition of the EOP. Such action must begin with tackling indoor air pollution. Providentially, doing so will also have the co-benefit of mitigating black carbon which is the second most important cause of global warming. But actions based on EJ and SD should extend far beyond that single measure and calls for sustainable energy that will enable the EOP to develop, and break the bonds of poverty and energy deprivation. The right of the EOP to SD must be re-affirmed.

TABLE OF CONTENTS

- I. Introduction
- II. Negative Effects of Indoor Energy Air Pollution
 - A. Effects on Human Health
 - B. Economic Effects
 - C. Environmental and Climate Change Effects
- III. The Concept of Sustainable Development
 - A. Stockholm Conference on the Human Environment 1972
 - B. World Commission on Environment and Development
 - C. The UN Conference on Environment and Development (UNCED) 1992
 - D. The UN Millennium Development 2000
 - E. World Summit on Sustainable Development 2002
 - F. Legal Institutionalization of Sustainable Development
 - G. Differences Among Developing Countries
- IV. Rawls and Sustainable Development
 - A. Rawls's Theory of Justice
 - B. Burdened Societies and Duty of Assistance

V. Sustainable Development and Global Warming

- A. Health
- B. Water Stress
- C. Sea Level Rise
- D. ADCs and SD

VI. Conclusion

I. INTRODUCTION

Energy Justice (“EJ”) conjugates justice with energy. Justice is the first virtue of social institutions;¹ energy is a fundamental need and the driving determinant of human progress.² Energy justice seeks to apply basic principles of justice as fairness to the injustice evident among people devoid of life sustainable energy, hereinafter called the energy oppressed poor (“EOP”). EJ is an integral and inseparable dimension of the universally accepted foundational principle, or *grundnorm*,³ of international law and policy: Sustainable Development (“SD”).

The original formulators of the concept, the World Commission on Sustainable Development, also known as the Brundtland Commission, pointed to the abject poverty of the developing world, and articulated a distributional principle which they called sustainable development. They reasoned that SD would meet the basic needs of the world’s poor by providing economic and social development without which environmental protection could not be achieved.⁴ This distributional principle of SD is now re-affirmed and expressed in the most widely accepted energy⁵ and environmental treaties⁶ and declarations.⁷ EJ,

1. JOHN RAWLS, A THEORY OF JUSTICE 3 (Harvard Univ. Press 1971) [hereinafter A THEORY OF JUSTICE].

2. LESLIE A. WHITE, THE EVOLUTION OF CULTURE: THE DEVELOPMENT OF CIVILIZATION TO THE FALL OF ROME 33–57 (McGraw-Hill 1959).

3. The *Grundnorm*, a German word translated as “Basic Norm,” was propounded by Hans Kelsen to mean the foundational principle that will ultimately govern a legal system. It is a premise or predicate against which all other rights and duties can be validated or falsified. HANS KELSEN, GENERAL THEORY OF LAW & STATE 110–13 (Harvard Univ. Press 1946).

4. U.N. World Comm’n on Env’t & Dev., *Our Common Future*, 43–54, U.N. Doc. A/42/427 (1987) available at <http://www.un-documents.net/ocf-01.htm> [hereinafter *Our Common Future*].

5. See, e.g., U.N. Framework Convention on Climate Change art. 3, ¶ 4, art. 4, ¶ 7, May 9, 1992, 31 I.L.M. 849 [hereinafter UNFCCC]; Kyoto Protocol to the U.N. Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 32 [hereinafter Kyoto Protocol] (giving expression to the principles embodied in the UNFCCC). The

however, has been egregiously ignored in international discourse and negotiations about energy and the environment. The present article impugns such global malfeasance.

The facts about energy justice are distressing. A disturbingly large swath of humanity is caught in a time warp. Between 2 and 2.5 billion people, amounting to nearly a third of the world, rely upon biomass-generated fire as their principal source of energy. These fires are made by burning animal dung, waste, crop residues, rotted wood, other forms of "bad" biomass, and raw coal. Unlike the rest of the world, the other third live without access to energy generated lighting, space heating, cooking, and mechanical power. They suffer from grinding poverty, lamentable diseases, lack of safe drinking water and sanitation, non-access to education, and barely experience economic and social development. Moreover, the biomass-generated fire they rely upon is an inadequate source of energy. It does not provide the kind of exogenous energy required for sustainable human development. Fire can be used for cooking and heating but fails to supply the majority of other basic energy needs. Fire does not power water pumps, grinding mills, vehicles, or agricultural equipment. Further, it does not provide clean lighting, water filtration, or more generally help create the goods and services required for food, clothing, and shelter.

In responding to this challenge, the nations of the world and the United Nations ("UN"), arrived at an obvious, rational, and integrated application of SD. In 2000, they agreed on the Millennium Development Goals ("MDGs") and Millennium Development Project ("MDP"). The objectives of the MDGs and MDP are to halve global poverty and

UNFCCC is particularly pertinent to this issue; it has received 194 instruments of ratification, and is the most extensively adopted treaty in the world.

6. See generally Convention on Biological Diversity art. 20 ¶ 4, June 5, 1992, 1760 U.N.T.S. 79; United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, Oct. 14, 1994, 1954 U.N.T.S. 3; Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126; Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutants, June 24, 1998, 37 I.L.M. 505; U.N. Conference on Environment and Development, June 3-4, 1992, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26 (1992) [hereinafter *Rio Declaration*]; U.N. Millennium Declaration, G.A. Res. 55/2, U.N. Doc. A/RES/55/2 (Sept. 8, 2000) [hereinafter U.N. Millennium Declaration]; World Summit on Sustainable Development, Aug. 26-Sept. 4, 2002, *Johannesburg Declaration on Sustainable Development*, U.N. Doc. A/CONF.199/20 (Sept. 4, 2002) [hereinafter *Johannesburg Declaration*]; U.N. Climate Change Conference, Dec. 7-18, 2009, *Copenhagen Accord*, U.N. Doc. FCCC/CP/2009/L.7 (Dec. 18, 2009) [hereinafter *Copenhagen Accord*].

7. *Rio Declaration*, *supra* note 6; U.N. Millennium Declaration, *supra* note 6; *Johannesburg Declaration*, *supra* note 6; *Copenhagen Accord*, *supra* note 6.

hunger, increase access to safe water and sanitation, provide primary education, and improve gender equality. They further seek to reduce child and maternal mortality by sixty-six percent, and reverse the growth of malaria, HIV/ AIDS, and other major diseases. The target year for achieving these goals is 2015.⁸ Two aspects of the MDGs are worthy of special notice. First, they require access to energy, and second, they are a prerequisite for dealing with global warming.

The MDGs cannot be satisfied without access to energy.⁹ First, the goal of reducing poverty depends on the availability of energy because even the most rudimentary forms of income-generating activities, like agriculture and small businesses, need energy to power machines for milling or grinding, for transportation to market goods and services, for telecommunications, and for education. Second, the goal of reducing hunger requires that more food be grown and distributed. Most forms of irrigation require energy to power water pumps, as well as for machines that harvest crops. Processing food requires energy, as does transportation and distribution. Third, water treatment plants that provide safe drinking water require energy, and hospitals need energy for refrigeration of vital medications and vaccinations. Finally, in order to provide primary education, schools require energy for lighting and heating, and students need lighting at home to do their homework. It seems almost obvious that the MDGs, as an instrument of SD, should concentrate on the developmental objectives of the EOP.

The environmental and global warming implications of the MDG are equally clear. It empowers and enables healthier, more educated peoples, including women, to adapt to and mitigate global warming. There is no doubt that healthier, more educated peoples, are better able to combat global warming than an ill educated population dying from illness, disease, hunger and malnutrition. The MDGs should be used to further SD by fulfilling the developmental objectives of the EOP as a necessary first step in meeting their environmental and global warming challenges.

Particularly during the last five to ten years, however, the international agenda has been dominated by fervent and dedicated global warming crusaders and blinkered decision-makers from the developed world, who appear anaesthetized to the plight of the EOP. Consequently,

8. See *infra* Section III(D).

9. See MODY ET AL., ENERGY SERVICES FOR THE MILLENNIUM DEVELOPMENT GOALS (The Int'l Bank for Reconstruction & Devel. 2005), available at http://www.unmillenniumproject.org/documents/MP_Energy_Low_Res.pdf; GWÉNAËLLE LEGROS ET AL., THE ENERGY ACCESS SITUATION IN DEVELOPING COUNTRIES 2 (World Health Org. & U.N. Dev. Programme 2009), available at http://content.undp.org/go/cms-service/stream/asset/?asset_id=2205620 [hereinafter LEGROS ET AL.].

the bulk of development assistance has been funneled toward reducing carbon dioxide and other greenhouse gas (“GHG”) emissions at the expense of the MDGs. For example, Secretary Clinton recently confirmed that the U.S. Agency for International Development’s (“USAID”) key focus on development assistance for over a decade has been on environmental programs that have reduced growth in GHG emissions.¹⁰ Given that the EOP hardly emit any GHGs, left unsaid is the stark fact that those USAID resources are not available for the MDGs. The obvious result is that international resources for achieving the MDGs are drying up. A recent report of the UN Development Program (“UNDP”) diplomatically emphasized this point. The report points out that economic growth, eradication of poverty, and the MDGs remain the highest priorities of developing countries, but that the focus of world leaders on reducing GHG emissions may constrain those priorities and efforts.¹¹

Climate change negotiations have ignored the EOP. In the most recent chapter of climate change negotiations under the UN Framework Convention on Climate Change (“UNFCCC”) at Copenhagen in December 2009, the world’s decision-makers, while paying lip service to SD, demonstrated once again that they remain impervious to the EOP and their lament of disease, public health problems, lack of safe drinking water, non-access to education, sickness, death, and economic deprivation that is not attributable to carbon dioxide. Consistent with their preoccupation with GHG reductions, world leaders continued to ignore the energy-based problems afflicting one-third of the world’s population, which are caused by the absence of modern sustainable energy. The Copenhagen Accord stated in passing that “Developing countries, especially those with low emitting economies should be provided incentives to continue to develop on a low emission pathway.”¹² However, this provision was left without reference to any funds to help fulfill such an objective. Instead, the only reference to funding made available to developing countries was for mitigation, adaptation, technological development and transfer, and capacity-building.¹³ Once again, the primacy of global warming was emphasized and funded while the plight of the non carbon dioxide generating EOP—and the countries they inhabit— were almost totally ignored. The

10. USAID, *Global Climate Change Program*, http://www.usaid.gov/our_work/environment/climate/ (last visited May 2, 2010).

11. U.N. MILLENIUM CAMPAIGN, *SEAL A JUST DEAL: THE MDG PATH TO A CLIMATE CHANGE SOLUTION 2* (2009), available at <http://southasia.oneworld.net/Files/MDGs%20and%20Climate%20Change.pdf>.

12. Copenhagen Accord, *supra* note 6, art. 7.

13. *Id.* art. 8.

amaurosis afflicting climate change negotiators is perplexing for a number of reasons.

Indoor pollution is the clearest example of an energy problem that extracts a horrendous toll of death and sickness, especially among women and children. It blights the EOP who rely on fire as their sole source of energy for cooking, illumination, and heating. Using an open fire, or a traditional stove fueled by biomass, results in inefficient combustion that releases dangerous quantities of carbon monoxide, particulate matter, and other pollutants into the air. These indoor pollutants result in the premature death every year of 2 million women and children from pneumonia, chronic obstructive pulmonary diseases, lung cancer, and asthma. They also cause chronic respiratory ailments and debilitating sickness for many more millions.¹⁴

With regard to indoor pollution, recent scientific investigations published in well established and respected peer-reviewed journals conclude that black carbon or black soot emitted by the burning of biomass makes the second strongest contribution to current global warming after carbon dioxide emissions.¹⁵ According to these studies, the particulates in black carbon absorb reflected solar radiation, as well as direct solar radiation, thus warming the atmosphere more severely than other greenhouse gases like methane, halocarbons, and tropospheric ozone. Moreover, black carbon can travel potentially thousands of miles on air currents, and eventually settle out of the air, onto land, water, and ice. Black carbon may lower the albedo, or reflectivity, of polar ice that covers vast stretches of the Arctic and Antarctica. The presence of overlying black carbon may result in ice retaining more heat, leading to increased melting and eventually a warmer Earth.¹⁶

These scientific facts offer compelling evidence that the EOP unmistakably and objectively fall within the economic, social, and environmental dimensions of SD. Providing cook stoves for example, could save millions of people from premature death and sickness, and free them to embark upon income generating economic activities. Moreover, the environmental co-benefits are incontestable. Apart from establishing a healthier population that can fight global warming, reducing black soot or black carbon by using cook stoves, will positively

14. LEGROS ET AL., *supra* note 9, at 2. Prior to this premature deaths were estimated at 1.5 million. WORLD HEALTH ORG., FUEL FOR LIFE 4, 12 (WHO Press 2006), available at <http://www.who.int/indoorair/publications/fuelforlife.pdf> [hereinafter WHO, FUEL FOR LIFE].

15. V. Ramanathan & G. Carmichael, *Global and Regional Climate Changes Due to Black Carbon*, 1 NATURE GEOSCIENCE 221, 221 (2008).

16. NASA & Goddard Space Flight Center Conceptual Image Lab, *Ice Albedo: Black Soot and Snow*, <http://svs.gsfc.nasa.gov/goto?10023> (last visited May 2, 2009).

and directly reduce global warming.

Furthermore, reducing black carbon will cost only a fraction of the price of carbon dioxide mitigation. Unlike carbon dioxide, which remains in the atmosphere from 50 to 200 years and is very costly to mitigate, black carbon is short-lived and significantly cheaper to remove. Even if all carbon dioxide emissions were miraculously stopped today, the effects of existing carbon dioxide will continue for a century. Conversely, black carbon dissipates and disappears within a week. Thus, the beneficial effects of the removal of black carbon will be felt within a short time frame.

First, we introduce the topic. Then Section II illustrates the problems of the EOP by examining indoor air pollution caused by burning biomass and the resulting public health and global warming repercussions. Section III analyzes the concept of SD and its legal incorporation into international law. It provides the historical context as to why the broader socio-political and legal responses to the problems of the EOP must be predicated on SD. Section IV deals with SD and John Rawls. SD expresses the foundational concepts of international justice developed by Rawls in his *Law of Peoples*.¹⁷ This section argues that Rawls offers the jurisprudential and philosophical foundations of SD. Section V addresses the question of global warming and SD, explaining why global warming is not the most important of the myriad problems confronting developing countries. Further, section V takes issue with the position of the developed world only to pledge scarce resources toward GHG mitigation and adaptation. Energy justice cries out for relief for the EOP who have no access to hydrocarbon-based energy, and do not emit significant quantities of GHGs. The decision made at Copenhagen to restrict global funding to the reduction of GHG emissions flies in the face of SD because it confines its assistance only to countries and peoples emitting carbon dioxide and other GHGs, and effectively penalizes the EOP for not being GHG emitters. The Conclusion will point out that addressing the problem of indoor pollution caused by burning biomass is only one step toward creating a more comprehensive basis for the energy-based SD of the EOP. This important first step, along with the mainstreaming of women¹⁸, should become part of an unbroken sustainable energy continuum spanning indoor pollution, agriculture, cottage industries, distributed energy, public health, and

17. See *infra* Section IV.

18. In essence this refers to the process of integrating gender considerations and women's rights into the mainstream of the development process. Gender inequities clearly reduce women's capabilities, and thus run directly counter to the goals of development. Expanding the capabilities of all people, including women, is an indispensable part of human development.

education to address the needs of the EOP.

II. NEGATIVE EFFECTS OF INDOOR ENERGY AIR POLLUTION

Humans are engaged constantly in energy conversions—processes that transform one form of energy into a more useful form. Because energy is necessary for meeting basic needs like cooking, sanitation, lighting, and heating, efficient human organization bears a strong correlation to effective energy conversion. The extent to which good organization can convert human labor to produce energy of the kind unimaginable before the industrial revolution is offered by the building of the Great Pyramid of Khufa.¹⁹ Technological innovations help convert fossil fuels, solar radiation, or nuclear fuels into other, more useful energy forms such as electricity, mechanical energy, or heat. The fossil fuel based civilization of the more prosperous two-thirds of the contemporary world has developed by exploiting the rich energy endowment embodied in fossil hydrocarbons. The very high energy density of these sources, along with the technological systems that have been fashioned to harness them, has created an enormously effective development subsidy for the prosperous.

In contrast, the world's remaining third, comprising fifty-two percent of the total population in developing countries, rely on biomass such as agricultural waste, animal dung, fuel wood, and charcoal, as their primary fuel source.²⁰ Using biomass for fuel, the process of cooking over an open fire, or even with a traditional stove, results in inefficient combustion. For instance, when using a traditional biomass-burning stove, only about eighteen percent of the energy from the fire goes into the pot. This inefficiency means that more biomass must be burned to

19. The Great Pyramid of Khufu at Giza has been described as perhaps the most colossal single building ever erected on the planet. See Encyclopædia Britannica Online, *Pyramids of Giza*, <http://www.britannica.com/eb/article-9036944/Pyramids-of-Giza> (last visited May 2, 2010). It was built by humans using slave labor or human energy converted by innovative social organization and management without the use of modern technology. Many archaeologists now believe that the Egyptian Pharaohs did not use slaves to build the pyramids, but rather conscripted peasants or even paid workers. See, e.g., Jonathan Shaw, *Who Built the Pyramids?*, HARVARD MAGAZINE, July-Aug. 2003, at 49–50, available at <http://harvardmagazine.com/2003/07/who-built-the-pyramids>. Regardless, the enormity of the Pharaohs' organizational achievement stands whether the workers involved were enslaved or free, and is perhaps more incredible if the workers were not coerced.

20. INT'L ENERGY AGENCY, WORLD ENERGY OUTLOOK 2006 419, 421 (2006), available at <http://www.iea.org/textbase/nppdf/free/2006/weo2006.pdf>.

cook meals, creating more pollution.²¹ Depending on the type of fuel and stove being used, indoor air pollution can contain a variety of dangerous pollutants, such as carbon monoxide, nitrous oxides, sulfur oxides, formaldehyde, carcinogens (such as benzene), and small particulate matter.²² This section discusses the effects of burning biomass on human health, local economics, and global warming.

A. Effects on Human Health

Reliance on biomass as a primary source of energy leads to many adverse consequences for human health.²³ The poverty associated with biomass dependence usually means that kitchens are small and poorly ventilated, causing extremely elevated concentrations of dangerous indoor air pollution. For instance, whereas the U.S. Environmental Protection Agency ("EPA") sets a limit of 150 $\mu\text{g}/\text{m}^3$ for small particulates in the United States, the World Health Organization ("WHO") reports that a typical twenty-four hour mean level for homes burning biomass fuels is between 300 to 3,000 $\mu\text{g}/\text{m}^3$.²⁴ This results in pollution levels that are far more deadly in EOP countries than the atmospheric pollution allowed by the developed world.

The negative health effects of indoor air pollution are not solely created by its high concentration in the air. Rather, negative health effects are also a function of the exposure level, based on the amount of time an individual spends inhaling the polluted air.²⁵ As women traditionally are responsible for cooking and childcare in the home, they spend more time inhaling the polluted air that is trapped indoors. Women and children thus have the highest exposure to indoor air pollution and disproportionately suffer from the associated negative health effects.²⁶

The time spent by EOP women cooking greatly increases their health risks²⁷ in addition to possible burns and injuries associated with

21. See HUGH WARWICK & ALISON DOIG, *SMOKE—THE KILLER IN THE KITCHEN* (ITDG Publishing 2004), available at <http://practicalaction.org/smoke/docs/smoke/itdg%20smoke%20report.pdf>.

22. WHO, *FUEL FOR LIFE*, *supra* note 14, at 8.

23. Martin Donohoe & Emily P. Garner, *Health Effects of Indoor Air Pollution From Biomass Cooking Stoves*, *MEDSCAPE PUBLIC HEALTH & PREVENTION*, May 19, 2008, <http://www.medscape.com/viewarticle/572069?src=mp&spon=42&uac=5243EK>.

24. WHO, *FUEL FOR LIFE*, *supra* note 14, at 10.

25. SANDY CAIRNCROSS ET AL., *HEALTH, ENVIRONMENT AND THE BURDEN OF DISEASE, A GUIDANCE NOTE 24* (Dep't for Int'l Dev. 2003), available at <http://www.dfid.gov.uk/Documents/publications/healthenviroindiseaseguidenote.pdf>.

26. Donohoe & Garner, *supra* note 23.

27. CAIRNCROSS ET AL., *supra* note 25, at 24.

cooking over an open fire. Depending on the demands of the local cuisine, women who cook over biomass fires generally spend between three and seven hours each day near the stove preparing food.²⁸ Not only do these women spend more total time around the fire, but they are also exposed to the most intense pollution which “occurs during short peaks when fuel is added or moved, the stove is lit, the cooking pot is placed on or removed from the fire, or food is stirred.”²⁹ Because these factors are generally not considered when calculating exposure from average pollution levels, the exposure of women to indoor air pollution may be underestimated by more than fifty percent.³⁰

Children are also particularly susceptible to the hazards of burning biomass, and often suffer from burns or injuries from interactions with open fires in addition to indoor air pollution effects. In many cultures, the provision of childcare involves mothers carrying their infants on their backs as they work and supervising young children inside. As a result, children spend many hours breathing indoor air pollution during the first few years of their lives. Infants and young children are particularly vulnerable to indoor air pollution because their airways are still developing, thus fifty-six percent of all indoor air pollution-attributable deaths occur in children under five years of age.³¹

Children may also be affected by indoor air pollution in utero. Emerging evidence suggests that pregnant women exposed to indoor air pollution may increase the risk of low birth weight and prenatal mortality, stillbirths, and deaths during the first week of life.³² Exposure to tobacco smoke is known to be a significant factor in decreased birth weight, and the health effects from the combustion of wood and other biomass are qualitatively similar to burning tobacco.³³ A study in Guatemala found that pregnant women using wood fuel gave birth to babies with a lower mean birth weight than women using cleaner fuels, even when socioeconomic status was taken into consideration.³⁴ Low birth weight impacts infant mortality and morbidity rates and puts children at further risk of developing respiratory illnesses if they survive past infancy.³⁵

28. World Health Org., Indoor Air Pollution and Health Fact Sheet No. 292 (June 2005), <http://www.who.int/mediacentre/factsheets/fs292/en/index.html> (last visited May 2, 2010) [hereinafter WHO, Indoor Air Pollution and Health].

29. CAIRNCROSS ET AL., *supra* note 25, at 24.

30. *Id.*

31. WHO, Indoor Air Pollution and Health, *supra* note 28.

32. *Id.*

33. WARWICK & DOIG, *supra* note 21, at 11–12.

34. CAIRNCROSS ET AL., *supra* note 25, at 26.

35. *Id.*

Indoor air pollution is responsible for approximately 1.6 million deaths per year in developing countries, amounting to one life lost every twenty seconds.³⁶ Most of these deaths take place in eleven countries—Afghanistan, Angola, Bangladesh, Burkina Faso, China, the Democratic Republic of the Congo, Ethiopia, India, Nigeria, Pakistan, and the United Republic of Tanzania—where indoor air pollution kills a total of 1.2 million people each year.³⁷ According to the WHO, exposure to high concentrations of indoor air pollution presents one of the ten most important threats to public health worldwide.³⁸ Exposure to indoor pollution results in acute respiratory infections (“ARI”), chronic obstructive pulmonary disease (“COPD”), lung cancer, tuberculosis, and asthma. Each of these conditions deserves brief mention.

The WHO estimates that 35.7% of all instances of ARI worldwide, such as pneumonia, are caused or worsened by exposure to biomass smoke.³⁹ Indoor air pollution can also increase the incidence of acute lower respiratory infections (ALRI) by affecting the body’s defense systems, such as the ability to filter and remove particles in the upper airways. ALRI is the most important single cause of death in children under age five, responsible for 3 to 5 million deaths in this age group annually.⁴⁰ There is consistent evidence that exposure to indoor air pollution can lead to ALRI in young children.⁴¹ A series of studies in developing countries indicates that young children living in homes dependant on biomass have a two to three times greater risk of suffering from ALRI than unexposed children. This figure was reached even after other factors, such as socioeconomic status, were accounted for.⁴² Although ALRI deaths have been declining in the industrialized world with improvements in vaccines and antibiotics, such remedies are often unavailable to the EOP.⁴³

Indoor air pollution is also considered a risk factor for chronic obstructive pulmonary disease (“COPD”), such as chronic bronchitis.⁴⁴

36. World Health Org. & U.N. Dev. Programme, *Indoor Air Pollution—the Killer in the Kitchen* (Oct. 14, 2004), <http://www.who.int/mediacentre/news/statements/2004/statement5/en/index.html> (last visited May 2, 2010), [hereinafter WHO, *Killer in the Kitchen*].

37. World Health Org., *Indoor Air Pollution Takes Heavy Toll on Health* (Apr. 30, 2007), <http://www.who.int/mediacentre/news/notes/2007/np20/en/index.html> (last visited May 2, 2010).

38. *Id.*

39. WARWICK & DOIG, *supra* note 21.

40. CAIRNCROSS ET AL., *supra* note 25, at 26.

41. WHO, *Indoor Air Pollution and Health*, *supra* note 2.

42. WARWICK & DOIG, *supra* note 21, at 11.

43. *Id.*

44. WHO, *Indoor Air Pollution and Health*, *supra* note 28.

In industrialized countries, tobacco smoking accounts for over eighty percent of COPD cases. However, this disease also occurs in the developing world in areas where tobacco smoking is rare. The UNDP states that the use of poorly ventilated, inefficient stoves “can have the same adverse health impacts as smoking two packs of cigarettes a day.”⁴⁵ A person who is exposed to a biomass fire on a daily basis is two to four times more likely to suffer from COPD than a person who remains unexposed. The WHO estimates that twenty-two percent of all COPD cases worldwide are caused by exposure to indoor air pollution from biomass fires.⁴⁶

Smoke inhalation is also associated with lung cancer. In developing countries, specific country studies⁴⁷ illustrate the general fact that even women who do not smoke tobacco form an unexpectedly high proportion of lung cancer patients,⁴⁸ While a clear link between lung cancer and biomass smoke has yet to be demonstrated, the International Agency for Research on Cancer (“IARC”) concluded that indoor emissions from household combustion of biomass is probably carcinogenic to humans.⁴⁹ Furthermore, after a thorough review of published scientific evidence, the IARC concluded that indoor emissions from household combustion of coal are, in fact, carcinogenic to humans.⁵⁰

There are several additional negative health effects associated with the daily inhalation of biomass smoke. Three published studies suggest that people in homes using wood for cooking are at 2.5 times greater risk of active tuberculosis than those who do not.⁵¹ Moreover, there is growing evidence suggesting that indoor air pollution causes cataracts.⁵² Furthermore, there is some evidence that wood smoke pollution can trigger and exacerbate asthma when combined with other ambient pollutants.⁵³

In sum, indoor pollution caused by biomass burning takes place in small, ill ventilated huts and kitchens, and leads to a noxious cocktail of

45. WARWICK & DOIG, *supra* note 21, at 11.

46. *Id.*

47. See YC Ko, et al., *Risk factors for primary lung cancer among non-smoking women in Taiwan*, 26 INT’L J. OF EPIDEMIOLOGY 24, (1997), available at <http://ije.oxfordjournals.org/cgi/content/abstract/26/1/24>.

48. Press Release, Int’l Agency for Research on Cancer, Indoor Emissions From Household Coal Combustion Carcinogenic: Women in Low- or Medium-Resource Countries Most Exposed (Nov 29, 2006), <http://www.iarc.fr/en/media-centre/pr/2006/pr172.html> (last visited May 2, 2010).

49. *Id.* at 30.

50. *Id.*

51. WARWICK & DOIG, *supra* note 21, at 11.

52. *Id.* at 12.

53. *Id.* at 11.

diseases that particularly afflict women and children. The resulting afflictions range over a spectrum from ALRI to bronchitis, tuberculosis, lung cancer, cataracts, and bodily harm by way of burns and injuries.

B. Economic Effects

In addition to the disproportionate health burden placed on women and children, biomass fuel collection also imposes a serious economic burden on the EOP. The average amount of time that a family spends collecting fuel falls between thirty minutes and two hours each day. Where biomass has become scarce, fuel collection can take much longer.⁵⁴ Children, particularly girls, may be kept out of school in order to assist their mothers with collecting fuel.⁵⁵ There are significant risks associated with collecting large amounts of biomass. Transporting large loads of fuel exposes women and children to injuries and pregnant women to miscarriages.⁵⁶ In areas of war and civil unrest, women and children may be exposed to violence and injury as they search for fuel away from their homes.⁵⁷

This perpetual chore of collecting fuel is both a cause and a result of poverty. Poor households often do not have the resources to obtain cleaner, more efficient fuels and appliances. These families are not faced with a choice, but a fact: they must cook using biomass or they will not eat.⁵⁸ Women in these circumstances tend to have limited decision-making power in the home, which decreases their ability to change the system, making household energy needs a lower priority than women might wish.⁵⁹ Reliance on biomass denies EOP women and children the opportunity for education and income-generating activities that could increase their family's standard of living.⁶⁰ Other consequences of poverty, such as malnutrition, deprivation, poor sanitation, and low standards of available medical services, further intensify the negative health effects of indoor air pollution.⁶¹ Thus, dependence on biomass contributes to a vicious cycle of poverty.

54. *Id.*

55. WHO, *Indoor Air Pollution and Health*, *supra* note 28.

56. WARWICK & DOIG, *supra* note 21, at 12.

57. *Id.*

58. WHO, *Killer in the Kitchen*, *supra* note 36.

59. CAIRNCROSS ET AL., *supra* note 25, at 25.

60. World Health Organization, *Broader Impacts of Household Energy* (2008), <http://www.who.int/indoorair/impacts/en/> (last visited May 2, 1010) [hereinafter WHO, *Broader Impacts*].

61. CAIRNCROSS ET AL., *supra* note 25, at 25.

C. Environmental and Climate Change Effects

In addition to perpetuating poverty and negatively affecting the health particularly of women and children, there are also severe environmental impacts of biomass dependence. The reliance on wood as a fuel source puts considerable pressure on local forests, particularly in areas where fuel is scarce and demand for wood outstrips natural re-growth.⁶² Depletion of woodland can lead to soil erosion and loss of a carbon sink.⁶³ Furthermore, it has been well established that burning dung and agricultural residues emits carbon dioxide and methane.⁶⁴ Arresting new research findings—well-received, though they have not yet garnered universal consensus among the scientific community—have now identified emissions from the burning of biomass as a significant cause of anthropogenic global warming.

According to an article in *Nature Geoscience*⁶⁵ discussed in *Science*,⁶⁶ the black carbon emitted by burning biomass makes the second strongest contribution to current global warming after carbon dioxide emissions. The article concludes that black carbon warms the atmosphere more severely than other greenhouse gases such as methane, halocarbons, and tropospheric ozone by absorbing both direct and reflected solar radiation contributing to a significant enhancement of lower atmosphere solar heating.⁶⁷

Unlike carbon dioxide, the primary cause of anthropogenic global warming that has a life cycle of 50 to 200 years, black carbon remains in the atmosphere for less than one year, and perhaps only for one week.⁶⁸ Although black carbon leaves the atmosphere much more quickly than carbon dioxide, its global warming capacity stays intact as long as its ambient concentrations remain high, which happens so long as newly emitted black carbon replenishes what is removed. However, if

62. WHO, *Broader Impacts*, *supra* note 60.

63. CAIRNCROSS ET AL., *supra* note 25, at 25.

64. See, e.g., Ambuj D. Sagar, *Alleviating Energy Poverty for the World's Poor*, 33 ENERGY POL'Y 1367, 1368 (2005). Sagar notes that burning crop residue and dung also degrades local farmland, as this biomass is not allowed to decompose and enrich the soil.

65. Ramanathan & Carmichael, *supra* note 15, at 221.

66. Robert F. Service, *Study Fingers Soot as Major Player in Global Warming*, 319 SCIENCE 1745, 1745 (2008).

67. Ramanathan & Carmichael, *supra* note 15, at 222–23. “Lower atmosphere” exists between the Earth’s surface and an altitude of roughly 3 km. In atmospheric “hotspots,” or regions with 15 W m⁻² forcing, black carbon can increase solar heating by as much as fifty percent.

68. *Id.* at 221. This results from the amplification of black carbon’s warming effect when mixed with other aerosols such as sulfates. The removal of black carbon from the ambient air removes a significant cause of pollution.

emissions were to cease today and not replenished, the existing ambient concentrations of black carbon would be gone in as little as one week. Thus, helping to move one-third of the global population away from biomass burning will have the effect of reducing global warming more efficiently than merely reducing carbon dioxide emissions. Furthermore, black carbon has also been implicated in interfering with the albedo effect of ice cover. Snow and ice are very reflective, and albedo refers to a specific form of reflectivity that allows between seventy and eighty percent of the sun's rays that hit snow and ice to bounce back into space. Two credible scientists conclude that black soot on snow impairs its albedo and may amount to a quarter of global warming.⁶⁹

Indoor pollution demonstrates the poverty of the EOP and the extent to which their plight cries out for SD. Human progress is largely determined by, and may even be equated with, the harnessing and use of energy. Accordingly, the economic and social development of the EOP must address the fact that a predominant reason for the poverty of the EOP lies in their lack of access to exogenous energy. Their right to energy places a correlative duty on developed countries. The contours of such a duty are defined by SD.

III. THE CONCEPT OF SUSTAINABLE DEVELOPMENT

The concept of SD has evolved over the last forty years and a brief description of its history sheds light on the importance of John Rawls's thinking, its relevance to SD, and the EOP. A quick synopsis of the major international conferences from 1972 reveals the extent to which the environment has lost its autonomous position as a subject worthy of protection in its own right. Currently, global environmental protection can only be pursued in tandem with economic and social development. Moreover, even one of the great environmental problems facing the world, carbon dioxide pollution resulting in global warming, can only be addressed within a framework of distributive justice, as part of the overall right to economic and social development established by the foundational norm of SD. A synoptic account of international diplomacy and law making casts light on how this transpired.

A. Stockholm Conference on the Human Environment

It began differently. The 1972 Stockholm Conference on the Human

69. James Hansen & Larissa Nazarenko, *Soot Climate Forcing via Snow and Ice Albedos*, 101 PROC. NAT. ACAD. SCI. 423, 428 (2004).

Environment (“Stockholm Conference”) was an environmental protection event. Up to about the time of the Stockholm Conference, international environmental problems had been dealt with in a sporadic and ad hoc manner resulting in few significant treaties or political declarations. These treaties and political instruments were isolated events that did not constitute a recognizable corpus of international environmental law. The development of law and policy leading to the Stockholm Conference was influenced by the world’s thinking, ideology, and culture of concern about the environment.

The themes articulated in Rachel Carson’s book, *Silent Spring* (1962), Barry Commoner’s book, *The Closing Circle* (1971), and Kenneth Boulding’s *Spaceship Earth*⁷⁰ resonated from the United States into the thinking of other industrial nations. Many of these and other themes were melded and expressed with crusading cogency within an international context in *Limits to Growth*⁷¹ a computer modeled study sponsored by the Club of Rome, a private group of industrialists and world leaders. The Meadows project team painted an apocalyptic picture of the growth of population, pollution, and exhaustion of natural resources leading to a break down of the carrying capacity of the earth.⁷² Along with a growing awareness of environmental phenomena such as acid rain and the poisoning of Japanese fisherman in Minimata Bay, these publications led to a realization of the frailty of the planet earth and created a ferment of apprehension among a cross section of common people, influential elites and decision makers in the developed industrial world.

In the face of these concerns, the UN was moved to convene a special international environmental conference to discuss the human environment in 1972. Sweden, which had begun to experience trans-boundary acid rain, volunteered to host it in Stockholm. The overall sense of crisis crying out for global action was brilliantly captured in the book by Rene Dubos and Barbara Ward, specially commissioned for the Stockholm Conference.⁷³ At the same time, the seeds of discord were actually sown at Stockholm.

While concern about the environment motivated many rich, developed, industrial countries, the poor, developing countries did not

70. See generally, RACHEL CARSON, *SILENT SPRING* (Houghton Mifflin, 1962); BARRY COMMONER, *THE CLOSING CIRCLE: NATURE, MAN, AND TECHNOLOGY* (New York : Knopf, 1971); Kenneth E. Boulding, *The Economics of the Coming Spaceship Earth, in ENVIRONMENTAL QUALITY IN A GROWING ECONOMY 3* (Henry Jarrett ed., 1966).

71. Meadows et al., *The Limits to Growth 9–12* (1974).

72. *Id.* at 23–24.

73. See generally, BARBARA WARD & RENÉ DUBOS, *ONLY ONE EARTH: THE CARE AND MAINTENANCE OF A SMALL PLANET 12* (1972).

share the view that environmental degradation was the biggest threat facing the planet. For developing countries, poverty and the alleviation of misery remained a more poignant and real problem. In the preparatory meetings leading to Stockholm, the developing countries—which called themselves the Group of 77 (their original number)—sharply and forcefully articulated the view that the worst pollution was caused by poverty. Developing countries believed that greater development leading to material prosperity far outweighed any damage that might be caused by resource use and pollution. They were particularly scornful of the claim that developed countries were genuinely trying to steer them away from pitfalls into which they had fallen. Developing countries expressed resentment over the fact that the developed countries—whose drive toward wealth had consumed a great part of the earth's resources and had led to devastating pollution—were now asking the developing countries to remain poor, and, more gallingly, to pay for the clean up, restoration, and conservation of the earth. Moreover, many developing countries feared that new environmental standards adopted by developed countries would effectively bar the entry of developing country goods into developed country markets.

This ideological impasse presented a formidable challenge to international environmental diplomacy and the question was resolved, as best it might be, by way of a compromise worked out in a meeting at Founex, near Geneva, Switzerland.⁷⁴ The compromise held that economic development was not necessarily incompatible with environmental protection, and that development could proceed, provided it avoided damaging the environment. The essence of that understanding was summed up in the Preamble to the Stockholm Declaration of the UN Conference on the Environment (“Stockholm Declaration”).⁷⁵ It stated that in developing countries, “[m]ost of the environmental problems are caused by under-development” and that developing countries must direct their efforts to development with due regard to the priority of safeguarding and improving the environment.⁷⁶ Similarly, the industrialized countries were exhorted to make efforts to reduce the developmental gap between themselves and the developing countries.

In sum, the developing countries successfully thwarted potential

74. The Secretary-General, *Development and Environment: Report and Working Paper of a Panel of Experts convened by the Secretary-General of the United Nations Conference on the Human Environment, Founex, Switzerland, U.N. Doc. GE 71-13738 (June 4–12 1971)*.

75. *Declaration of the United Nations Conference on the Human Environment* pmb., June 16, 1972, U.N. Doc. A/CONF.48/14/Rev.1 (1973), *reprinted in* 11 I.L.M. 1416 (1972).

76. *Id.* § I, ¶ 4.

environmental laws and policies from damaging their efforts to develop and grow economically, whether by industrial progress or trade. The concept of SD had not been born yet and they did not obtain substantial bankrolling for environmentally conscious development. The Stockholm Declaration also did not meaningfully advance the doctrine of “common but differentiated responsibility. This concept later accepted at the 1992 Earth Summit or UN Conference on Environment and Development (“UNCED”), in Rio de Janeiro, Brazil as a means of recognizing the different needs of developed and developing countries.

B. World Commission on Environment and Development

Despite the uneasy truce at Founex reflected in the Stockholm Declaration, the persistent clash of two cultures—environmental protection and development—continued to obstruct the progress of international environmental law and policies. In order to resolve this problem, the World Commission on Environment and Development (“WCED” or “Brundtland Commission”) was created by the UN General Assembly in 1983 and charged with proposing long-term environmental strategies for *sustainable development*. That elusive term was not defined by the UN, and, despite the efforts of the Brundtland Commission and the Earth Summit, still eludes satisfactory definition. After four years of deliberation and worldwide consultation, the Brundtland Report, entitled *Our Common Future*, articulated the paradigm on which the Earth Summit, and indeed most environmental laws and policies, has since been based. In essence, it rejected the despairing thesis that environmental problems were past repair, spiraling out of control, and could only be averted by arresting development and economic growth: a policy of no growth. Instead, it argued that economic growth was both desirable and possible within a context of sustainable development.⁷⁷

Although sustainable development was not clearly defined, some of its key attributes are identifiable. It calls for developmental policies and for economic growth that can relieve the great poverty of the LDCs while simultaneously protecting the environment from further damage. Such development and growth should be based on policies that sustain and expand the environmental resource base in a manner that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

Pursuant to the report, the UN General Assembly summoned UNCED, or Earth Summit, directing it to take account, *inter alia*, of the Stockholm Declaration and further develop International Environmental

77. *Our Common Future*, *supra* note 4, ch. 1.

Law. An ambitious agenda was drawn up for the Earth Summit that included the following three endeavors: (1) an Earth Charter that would be the successor to the Stockholm Declaration; (2) an action plan for the planet called Agenda 21; and (3) the ceremonial signing of two conventions on biodiversity and climate change.

*C. The UN Conference on Environment and Development, 1992
(UNCED)*

The Earth Summit, as UNCED was popularly called, was held in Rio de Janeiro in June, 1992, and attended by over 180 countries and 100 heads of state. It was heralded as the greatest summit level conference in history. It led to four institutional results: (1) the Rio Declaration on Environment and Development ("Rio Declaration");⁷⁸ (2) Agenda 21;⁷⁹ (3) the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests;⁸⁰ and (4) the ceremonial signing of the Climate Change and Biodiversity Convention.

UNCED marked a watershed in international environmental law and policy-making. It made abundantly clear that the pursuit of environmentalism cannot be divorced from the right of developing countries to economic advancement. Some environmentalists were upset by the manner in which UNCED subjugated the environment to the right to development, or the way in which environmentalism was inextricably tied to the hips with economic development. From an environmental standpoint, the legal results of the Earth Summit were, at best, mottled. While it did draw universal attention to environmental protection and raised many issues onto the global agenda, the substantive environmental legacy of Rio—apart from the Climate Change Convention—remained unimpressive and inchoate.

From an environmental standpoint that does not cede normative or temporal priority to social and economic progress, the braided rope of SD effectively turned the clock back from the Stockholm Conference. For example, the nascent right to a wholesome environment embodied in the Stockholm Declaration was abandoned in favor of a right to

78. Rio Declaration, *supra* note 6.

79. U.N. Conference on Env't and Dev., June 3–14, 1992, *Agenda 21*, U.N. Doc. A/CONF. 151/26(1992), available at http://www.un.org/esa/dsd/agenda21/res_agenda21_00.shtml.

80. U.N. Conference on Environment and Development, June 3–14, 1992, *Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests*, U.N. Doc. A/CONF. 151/26 (Vol. III) (1992).

development,⁸¹ and the obligation to *conserve* implied by the duty to protect the environment for the benefit of future generations found in the Stockholm Declaration is replaced in the Rio Declaration by a right to *consume* or develop. Moreover, the Rio formulation refers to “developmental and environmental needs of present and future generations”⁸² and in doing so impliedly negates or weakens the obligation to conserve expressed in the Stockholm Declaration. Finally, the Rio Declaration frowns upon action such as that taken by the United States under the Marine Mammal Protection Act of 1972⁸³, to prevent the slaughter of dolphins by prohibiting imports of tuna caught in dolphin killing nets. Principle 12 of the Rio Declaration states that “unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided.”⁸⁴

Agenda 21, a comprehensive albeit non-binding call to action, was also shaped by the tension between development and environmental protection, and calls for the “integration of environment and development concerns and greater attention to them.”⁸⁵ Like the Rio Declaration, as contrasted with the Stockholm Declaration, it incorporated several concessions to developmental needs. While Agenda 21 calls for the conservation and protection of resources, it also mirrors the Rio Declaration in acknowledging the unique position of economies in transition, affirming the priority of political and social challenges in developing nations.⁸⁶ Specifically, Chapter 3.2 gives substantial deference to the use of natural resources to combat poverty. Chapter 39, which deals with the review and development of international environmental policy, stresses the importance of participation by developing countries in drafting new legal instruments, but reaffirms the need to weigh their developmental needs against the obligations that might be imposed by those instruments.

D. The UN Millennium Declaration

The need for distributional justice that alleviates poverty was further institutionalized at the 2000 Millennium Summit. The resulting Millennium Declaration is a UN document that expresses and outlines the collective commitment of the world to achieve eight major

81. Rio Declaration, *supra* note 6, Principle 2.

82. *Id.* Principle 3.

83. Marine Mammal Protection Act of 1972, 16 U.S.C. §§ 1361–1421 (1994).

84. Rio Declaration, *supra* note 6, Principle 12.

85. *Agenda 21*, *supra* note 79, Chapter 1.1.

86. *Id.* ch. 1.5.

development goals by the year 2015.⁸⁷ These goals, which have come to be known as the Millennium Development Goals (“MDGs”), seek to (1) eradicate extreme poverty and hunger; (2) achieve universal primary education; (3) promote gender equality and empower women; (4) reduce child mortality; (5) improve maternal health; (6) combat HIV/AIDS, malaria and other diseases; (7) ensure environmental sustainability; and (8) develop a global partnership for development.⁸⁸

The MDGs presaged an important re-conceptualization of SD that became fully evident at the World Summit on Sustainable Development (“WSSD”) in 2002. Prior to the WSSD the concept of SD was widely viewed as consisting of two elements—environmental protection and economic development. Social development was not treated as an explicit and co-equal element of SD, but was instead considered a part of the economic development half of SD. The MDGs, however, placed a primary emphasis on the importance of achieving sustainable development by addressing the many dimensions of poverty—such as hunger, disease, inadequate shelter and exclusion—and other social concerns such as gender equality and access to education.⁸⁹ The MDGs signal a conceptual shift with respect to the definitional understanding of SD—a shift that moves from the binary environment-economy paradigm to a tripartite understanding that incorporates social development. This new definition of SD embraces a more specific overlap between its three components: social development, economic development, and environmental protection. The commitment of the international community to ensuring “the timely and full realization of the [MDGs]” was reaffirmed at the 2005 World Summit.⁹⁰

E. World Summit on Sustainable Development 2002

The WSSD gave birth to two documents: a political Declaration and an Implementation Plan,⁹¹ that were clearly riveted to the problems created by poverty not environmental degradation. The Declaration

87. U.N. Millennium Declaration, *supra* note 6, § 1.

88. See U.N. DEPT. OF ECON. AND SOC. AFFAIRS, THE MILLENNIUM DEVELOPMENT GOALS REPORT (2006), available at <http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2006/MDGReport2006.pdf> [hereinafter MILLENNIUM DEVELOPMENT GOALS].

89. See The Secretary-General, *Road Map Towards the Implementation of the United Nations Millennium Declaration*, U.N. Doc. A/56/326 (Sept. 6, 2001) [hereinafter *Road Map Towards Implementation*].

90. See U.N.G.A. RESOLUTION, 2005 WORLD SUMMIT OUTCOME, A/RES/60/1 (2005), available at <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan021752.pdf>.

91. Johannesburg Declaration, *supra* note 6.

affirmed “a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development—economic development, social development and environmental protection—at the local, national, regional, and global levels.”⁹² The same principles were endorsed in the Implementation Plan.⁹³

This re-articulation of SD confirms the third element in the definition of SD introduced at the Millennium Summit. Social development, which hitherto had been subsumed under the rubric of economic development, is now treated as a separate concept. This is a significant development to the extent that SD—which hitherto consisted of two legs (economic development and environmental protection)—has now been given a third (social development). Consequently, environmental protection, which had enjoyed rough parity with economic development, has now been reduced to a third part of a tripartite concept.

F. Legal Institutionalization of Sustainable Development

The UN Framework Convention on Climate Change (“UNFCCC”) is the most important energy convention in the world. Having obtained 194 instruments of ratification, it is probably the most extensively adopted treaty in the world.⁹⁴

Its Preamble affirms and recognizes that:

... responses to climate change should be coordinated with social and economic development ... with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty ... [and] that ... *energy consumption will need to grow ...* (emphasis added).

The UNFCCC coalesced with another widely accepted treaty, the Convention on Biological Diversity (“CBD”), by forcefully and unequivocally expressing the developmental priority of SD. Art. 4(7) of the UNFCCC, and Art. 20(4) of the CBD,⁹⁵ re-affirm in unison that parties “*will take fully into account that economic and social development and poverty eradication are the first and overriding*

92. *Id.* art. V.

93. *Id.* ch. 1, ¶ 2

94. See UNFCCC, *supra* note 5, art. 4 ¶ 7. See also Kyoto Protocol, *supra* note 5. The Kyoto Protocol is a Protocol to the UNFCCC.

95. Convention on Biological Diversity, 49 U.N. GAOR Supp. (No. 49), U.N. Doc. A/49/49 (June 5, 1992), available at <http://www.cbd.int/convention/convention.shtml>.

priorities of the developing country Parties"

There are a number of other notable provisions reiterating the developmental facets of SD. Art. 3(1) of the UNFCCC states that the Parties have a *right* to and should promote sustainable development, and that economic development is essential for adopting measures to address climate change, while Art. 3(2) affirms that full consideration be given to the special circumstances of developing countries. Parties are required to protect the climate system on the basis of equity and in accordance with their common but differentiated responsibilities and respective capacities.⁹⁶ The principle of common but differentiated responsibility affirms the responsibility of the developed country parties to take the lead in combating climate change and the adverse effects thereof.⁹⁷

What is clear is that the objective of preventing dangerous anthropogenic interference with the climate system is built upon the foundation of SD and that climate change, which is interlinked with SD, should not threaten economic development.⁹⁸ Moreover, the importance of SD is also incorporated in numerous other treaties,⁹⁹ while the human, social, economic and environmental dimensions of SD are referred to in numerous quasi-legal documents.¹⁰⁰

96. UNFCCC, *supra* note 5, art. 3 ¶1, art. 4 ¶ 1.

97. *Id.* art. 3 ¶ 1.

98. *Id.* art. 2.

99. International Convention on the Elimination of All Forms of Racial Discrimination, G.A. Res. 2106 (XX), annex arts. 1, 5, 6, 7, 11, 12 and 13, 20 U.N. GAOR Supp. (No. 14), U.N. Doc. A/6014 (Dec. 21, 1965); International Covenant on Economic, Social and Cultural Rights, G.A. Res. 2200A (XXI), arts. 24, 27, 28, 29, and 32, 21 U.N. GAOR Supp. (No. 16), U.N. Doc. A/6316 (Dec. 16, 1966); Convention on the Elimination of Discrimination Against Women, G.A. Res. 34/180, arts. 3, 7, 10, 11, 13, and 14, 34 U.N. GAOR Supp. (No. 46), U.N. Doc. A/34/46 (Dec. 18, 1979); Convention on the Rights of the Child, G.A. Res. 44/25, annex, 44 U.N. GAOR Supp. (No. 49), U.N. Doc. A/44/49 (Nov. 20, 1989); Convention concerning Indigenous and Tribal Peoples in Independent Countries (No.169), *adopted* June 27, 1989, 72 ILO Official Bull. 59 (1989) (entered into force Sept. 5, 1991).

100. It is possible for governments to begin the process of creating customary law (which is based on the two requirements of state practice and *opinio juris*) by the act of voting for declarations and resolutions within international organizations such as the UN. After being passed, such aspirational resolutions and declarations could evolve first into a quasi-legal or "soft law" instruments, and subsequently develop into legally binding (hard law) instruments by attracting state practice and *opinio juris*. These declarations include: Universal Declaration of Human Rights, G.A. Res. 217A (III), arts. 21, 23, 24, 25, 26 and 27, U.N. Doc. A/810 (Dec. 12, 1948), *available at* <http://www.un.org/Overview/rights.html>; Declaration on the Right to Development, G.A. Res. 41/128, annex, 48 U.N. GAOR Supp. (No. 53), U.N. Doc. A/41/53 (Dec. 4, 1986); Rio Declaration, *supra* note 6; MILLENNIUM DEVELOPMENT GOALS, *supra* note 88.

G. Differences Among Developing Countries

Unfortunately, for too long, the EOP have been glossed over or lost in the categorization of their predicament simply as being problems of the developing world, or they have been painted with the same socio-political and economic brush as the states in which they are located. For example, the EOP tend to be seen primarily as a problem of India or China or Brazil and not perceived as a burdened society apart from the geopolitical entities in which they reside. Such classification is unhelpful to the extent that the EOP in many countries are not stakeholders in the government or political machinery exercising control over their geographical location.

All developing countries tend to be conceptualized within a single typology based on the binary division of the world into developing and developed countries or north and south. The inaccuracy and mistake of doing so is underlined by a recent authoritative joint report of the UNDP and WHO emphasizing the plight of the LDCs and sub-Saharan African countries.¹⁰¹ While twenty-eight percent of people in developing countries lack access to electricity, the number in the LDCs is seventy-nine percent.¹⁰² Thus, the differences between the LDCs, located primarily in sub-Saharan Africa and parts of Asia, in contrast to the advanced developing countries (“ADCs”), like China, India, the Asian Tigers,¹⁰³ and Brazil, must be recognized. It is therefore necessary at the outset to acknowledge at least two major categories among the developing countries: LDCs and ADCs, and not treat all of them simply as developing countries. Obviously, there are no cookie cutter solutions. The commonalities, differences, and variegated energy needs, uses and demands of ADCs and LDCs call for complex, nuanced, and demanding responses that would vary on a case-by-case basis.

The LDCs consist of fifty countries and 767 million people located largely in Africa and Asia.¹⁰⁴ The LDCs have been officially identified by the UN as “least developed” in the light of their low income (GDP of less than \$7,500); weak human assets (low nutrition, high mortality, lack of school enrollment, and high illiteracy); high economic vulnerability; exposure to natural shocks and disasters; prevalence of trade shocks;

101. LEGROS ET AL., *supra* note 9, at 1–4.

102. *Id.* at 1.

103. Originally called the Four Asian Tigers or East Asian Tigers, the term referred to the economies of Taiwan, Singapore, Hong Kong, and South Korea, but the term has been extended to include Thailand and Indonesia.

104. U.N. Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, Least Developed Countries: Country Profiles, <http://www.unohrlls.org/en/ldc/related/62/> (last visited May 3, 2010).

economic smallness; and economic remoteness.¹⁰⁵ They do not share the economic or technological strengths of the ADCs. It is worth noting in this context that the push for more energy and specifically for coal-powered energy arises from the ADCs, not the LDCs. The problems facing the LDCs and the predominantly rural EOP located within them, unlike those of ADCs, arise from their woeful lack of energy and suboptimal energy conversions. In contrast, most ADCs use fossil fuel energy and hunger for more of it to satisfy their industrial appetite.

Furthermore, the differences between the energy rich or high-energy users and the low energy using EOP in ADCs have not been recognized. The fact that the EOP reside in the same country as the energy rich should not obscure the monumental disparities between them. While the top echelons of the economic pyramid in ADCs are inhabited by high-energy users, the EOP—who have no access to power or electricity—populate the much larger lower parts of the economic pyramid. The substance of these realities is echoed, by recent reports of the WHO and the UNDP.¹⁰⁶ Indeed, as the middle classes of China and India rapidly approach lifestyles comparable to the middle classes in Europe and North America, the EOP in these countries remain hidden in the toxic haze of windowless huts, cut off from the attention of their governments and the wider world.

ADCs like China and India have been treated as monoliths, when in reality those who inhabit the developed parts of these countries live dramatically different lives from the rural and urban EOP. Such mega-sovereign states may count as single nations under international laws and relations, but in fact consist of a plurality of socio-political, economic, cultural, and geographical entities. The similarity between the EOP in LDCs and the EOP in ADCs has generally been ignored. The socioeconomic condition and lack of technological knowledge among the

105. *Id.*

106. LEGROS ET AL., *supra* note 9, at 1–4; U.N. DEVELOPMENT PROGRAMME, HUMAN DEVELOPMENT REPORT 2007–2008 355–357 (2007), available at http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf. Each year since 1990, the Human Development Report (“HDR”) of the UN Development Program (“UNDP”) publishes the Human Development Index (“HDI”). This index looks beyond gross domestic product (“GDP”) to a broader definition of well-being. The HDI seeks to capture three dimensions of human development: a long and healthy life (measured by life expectancy at birth); being educated (measured by adult literacy and enrolment in primary, secondary and tertiary education); and GDP per capita measured in U.S. dollars at Purchasing Power Parity (“PPP”). According to a recognized Indian commentator, India rose from ranked number eight in the Forbes list in 2006 to number four in 2007 in the dollar billionaire rankings, but slipped from 126 to 128 in human development of the UN Development Programme. See P. Sainath, *India 2007: High growth, low development*, THE HINDU, Dec. 24, 2007, <http://www.indiatogether.org/2007/dec/psa-i2007.htm> (last visited Mar. 26, 2010).

500 million EOP in China and India are analogous to the 750 million EOP in the LDCs. These EOP form distinct burdened societies, and justice calls for them to be treated as such.

Given the widespread existence of energy poverty, the services provided by energy could save millions of EOP lives in any type of developing country. Ideally, energy services could power pumps and filters to supply relatively safe drinking water and help provide sanitation to reduce water-borne diseases. Cooking devices powered by solar, kerosene, gas, or electricity would shrink indoor pollution responsible for millions of premature deaths from pulmonary diseases, primarily of women and children, caused by the need to collect and use wood and other biomass for cooking and heating. Energy would free young girls from the drudgery of fuel collection and enable them to go to school. Energy is the key component of a functional health system, providing lights for operating rooms, refrigeration for life-saving vaccines and life-saving drugs, and power for communication systems.¹⁰⁷ Cheap accessible energy would decrease deforestation, reduce air borne pollutants, and prevent injuries and desertification arising from the search for fuel, food, and water in semi-desert climates.

Ideally, the availability of modern energy services would promote income generation in developing countries. Electricity can provide illumination to permit longer working hours and power for irrigation, both of which help yield high-value crops. The use of process heat for grinding, milling, husking, and preserving can create value-added products from raw agricultural commodities. Refrigeration can enable sales to higher value markets. Computers, internet, and telephone can provide access to information and markets and facilitate greater trade.¹⁰⁸ But, as has been argued elsewhere,¹⁰⁹ the true costs of and collateral damage caused by modern fossil fuel energy outweighs its benefits. Consequently, reliance should instead be placed on appropriate sustainable energy technologies (“ASETs”) to produce energy that

107. CHRISTOPHER FLAVIN & MOLLY HULL AECK, *ENERGY FOR DEVELOPMENT: THE POTENTIAL ROLE OF RENEWABLE ENERGY IN MEETING THE MILLENNIUM DEVELOPMENT GOALS 24* (Worldwatch Institute 2005); R.M. Shrestha, et al., *Application of Productive Uses of Renewable Energy for Small, Medium and Micro Enterprises 2*, prepared for the U.N. Development Programme Expert Meeting on Productive Uses of Renewable Energy, May 9-11, 2005, available at <http://www.serd.ait.ac.th/ep/epkas/presentation/Papers/AIT%20Paper%20PURE%20and%20SMEs%20Final.pdf>.

108. See GLOBAL NETWORK ON ENERGY FOR SUSTAINABLE DEVELOPMENT, *REACHING THE MILLENNIUM DEVELOPMENT GOALS AND BEYOND: ACCESS TO MODERN FORMS OF ENERGY AS A PREREQUISITE 5* (2007), available at http://www.gnesd.org/Downloadables/MDG_energy.pdf.

109. Lakshman Guruswamy, *Energy Justice*, in *CLIMATE CHANGE: A READER* (William H. Rodgers, Jr., et al., eds., 2009).

satisfies the energy needs of the EOP while avoiding the damage caused by hydrocarbons.

While SD calls for the energy dominant two-thirds of the world to recognize and remedy the afflictions of the EOP, it is important, however, to go beyond assertion and conceptualize the jural foundations or predicates for remedying the plight of the EOP. The original proponents of SD—the World Commission on Environment and Development, major international treaties incorporating the concept, and even the UN Millennium Declaration¹¹⁰ and the MDGs¹¹¹—did not examine the philosophical or jurisprudential foundations of SD.¹¹² Nor is it examined in numerous well-meaning reports from science academies.¹¹³ The moral and jural bases for the provision of modern energy services to the EOP based on SD and EJ are best encapsulated in the work of John Rawls.

IV. RAWLS AND SUSTAINABLE DEVELOPMENT

John Rawls's foundational concepts of international justice, particularly in his *Law of Peoples*,¹¹⁴ provides a moral justification for SD. Rawls's elucidates the duty of liberal democratic and decent hierarchical peoples to assist "burdened societies" to the point where burdened societies are enabled to join the "society of peoples." It is of particular pertinence that Rawls's duty of assistance does not absolve developing country governments of their obligation to take appropriate action. While Rawls discusses a "realistic utopia" grounded in socio-political, institutional, and psychological reality,¹¹⁵ he is still dealing with a utopian future. This section attempts to reconcile Rawls's ideas with present realities insofar as they apply to SD and the EOP.

110. U.N. Millennium Declaration, *supra* note 6.

111. *Road Map Towards Implementation*, *supra* note 89.

112. See UNFCCC, *supra* note 5.

113. For example, the InterAcademy Council ("IAC") concluded recently that meeting the basic energy needs of the poorest people on this planet is a moral and social imperative. In May 2000, all of the world's science academies created the IAC to mobilize the best scientists and engineers worldwide to provide high quality advice to international bodies—such as the UN and the World Bank—as well as to other institutions. See INTERACADEMY COUNCIL, LIGHTING THE WAY TOWARD A SUSTAINABLE ENERGY FUTURE (2007), available at <http://www.interacademycouncil.net/Object.File/Master/12/096/First%20half.pdf>.

114. JOHN RAWLS, THE LAW OF PEOPLES 106 (Harvard Univ. Press 1999) [hereinafter THE LAW OF PEOPLES].

115. *Id.*

This section first explains Rawls's theory of justice. Following this, it delineates how he provides a rational jurisprudential and philosophical foundation for SD, as well as for dealing with the EOP as burdened societies or peoples distinct from countries or nations. As burdened societies, the EOP are denuded of human capital by sickness and death, and lack the knowledge-based, monetary or technological resources necessary to break free from their energy bondage and become fulfilled members of a well-ordered society. This section then canvases Rawls's assertion that the prosperous peoples in the developed world *have a duty to assist burdened societies*¹¹⁶ to reduce their burdens, and to raise them to a position where they make intelligent and effective use of their unburdened status, and lead reasonable and worthwhile lives.

A. Rawls's Theory of Justice

Rawls's unique contribution to moral and political philosophy lies in the manner in which he unites moral philosophy (intuitionism) and social philosophy (contractarianism) to formulate principles that are constructive and rational for liberal democratic societies. According to Noah Feldman, "Rawls's historical importance thus derives from his extraordinary accomplishment of grafting a Kantian-inspired moral theory onto a familiar—yet modified—discourse of social contract and then using the resulting product to justify the Western welfare state, and thus welfare capitalism itself."¹¹⁷

The law of peoples would be a kind of higher law, creating rights and duties for peoples and states. It would impose moral duties and obligations on all persons and states living in well-ordered hierarchical societies. Rawls now arrives at a critical conclusion: well-ordered peoples "*have a duty to assist burdened societies*"¹¹⁸ to reduce their burden, and to raise them to a position where they may join the ranks of well-ordered peoples.¹¹⁹ According to Rawls, "burdened societies" do not fall within the category of well-ordered societies because they may have become denuded of human capital by sickness and death or lack the knowledge-based, monetary or technological resources needed to be a well-ordered society.

Rawls's "original position," a thought experiment expounded in *A Theory of Justice* and developed in numerous other works,¹²⁰ envisioned

116. *Id.*

117. Noah Feldman, *Cosmopolitan Law?* 116 YALE L.J. 1022, 1038 (2007).

118. THE LAW OF PEOPLES, *supra* note 114, at 106 (emphasis added).

119. *Id.* at 111.

120. See A THEORY OF JUSTICE, *supra* note 1; JOHN RAWLS, POLITICAL LIBERALISM (Columbia Univ. Press 1993) [hereinafter POLITICAL LIBERALISM]; THE LAW OF

a collection of negotiators from liberal democratic societies. The negotiators assembled behind a veil of ignorance and shorn of any knowledge that might be the basis of self-interested bias—such as knowledge of their gender, wealth, race, ethnicity, abilities, and general social circumstances. Rawls explains that the purpose of such a negotiation was to arrive at legitimate principles of justice under fair conditions—hence “justice as fairness.”¹²¹ He further stipulates two governing principles for any fair negotiation. First, each person is given equal rights to the most extensive basic liberties. Second, social and economic inequalities are to be re-arranged so that they may bestow the greatest benefit to the least advantaged, and attach to offices and positions open to all under conditions of equality and liberty.¹²² This second principle is known as the difference principle.

In his *Law of Peoples*, concerning justice and international law, Rawls extends his theories from liberal democratic states to “decent” peoples living in non-democratic international societies. Rawls envisions such “well-ordered hierarchical societies” to be “non liberal societies whose basic institutions meet specified conditions of political right and justice (including the right of citizens to play a substantial role, such as participating in associations and groups making political decisions) and lead their citizens to honor a reasonably just law for the Society of Peoples.”¹²³ Well-ordered societies must satisfy a number of criteria: they must eschew aggressive aims as a means of achieving their objectives, honor basic human rights dealing with life, liberty, and freedom, and possess a system of law imposing bona fide moral duties and obligations, as distinct from human rights. Moreover, they must have law and judges to uphold common ideas of justice.¹²⁴

Rawls emphasizes the crucial importance of peoples rather than states because of a people’s capacity for “moral motives” that is lacking

PEOPLES, *supra* note 114; JOHN RAWLS, JUSTICE AS FAIRNESS: A RESTATEMENT (Harvard Univ. Press 2001); John Rawls, *Justice as Fairness*, 67 PHIL. REV. 164 (1958); John Rawls, *Justice as Fairness: Political Not Metaphysical*, 14 PHIL. & PUB. AFFAIRS 223 (1985).

121. JOHN RAWLS, JUSTICE AS FAIRNESS: A RESTATEMENT, *supra* note 120.

122. POLITICAL LIBERALISM, *supra* note 120, at 5–6. According to Rawls, persons in an original position agree that all basic liberties such as political freedom and freedom of choice in occupations, opportunity, income, wealth, and self-respect will be distributed equally unless an unequal distribution of any or all of these goods is to the advantage of the least favored. Rawls thus depicts justice as an issue of fairness permitting an unequal distribution only to the extent that the weakest members of society benefit from that inequality. To Rawls, therefore, redistribution is justified where it would improve the situation of the disadvantaged.

123. THE LAW OF PEOPLES, *supra* note 114, at 3.

124. A THEORY OF JUSTICE, *supra* note 1, at 64–67.

in the bureaucratic machinery of a state.¹²⁵ Samuel Freeman correctly observes that a “people” for Rawls is a philosophical construct. It is an abstract conception needed to work out principles of justice for a particular subject—in this case, relations among different well-ordered liberal and “decent” societies.¹²⁶ The assumption that states lack moral motives is partially refuted by their acceptance of SD. Nonetheless, Rawls remains trenchant when it comes to the application of SD. Rawls is not talking then about a people regarded as an ethnic or religious group (e.g. Slavs, Jews, Kurds) who are not members of the same society. Rather, a people consists of members of the same well-ordered society who are united under, and whose relations are governed by, a political constitution and basic structure. Comprised of members of a well-ordered society, a people is envisioned as having effective political control over a territory that its members govern and within which their basic social institutions take root. In contrast to a state, however, a people possess a “moral nature” that stems from the effective sense of justice of its individual members. A people’s members may have “common sympathies” for any number of non-requisite reasons, including shared language, ethnic roots, or religion. The most basic reason for members’ common sympathies, however, lies in their shared history as members of the same society and consequent shared conception of justice and the common good.

Rawls’s concept of “peoples” has been criticized. Among his more cogent critics, Pogge¹²⁷ and Nussbaum¹²⁸ question the validity of the distinction between peoples and states, and the difficulties of defining peoples. They claim their criticisms assume importance in any attempt to realize the ‘society of Peoples’ Rawls envisions as his realistic utopia. Such criticisms have actually been anticipated by Rawls, who pointed out that he eschewed the “state” as a polity because of its historical Hobbesian connotations in “realist” international political theory, which suggests that the power of states can be limited only by the states, and not by moral or legal constraints.¹²⁹ Here again, the legal and political acceptance of SD by the community of nations refutes Rawls at the theoretical level. But Rawls still remains relevant at the practical and functional level, when it comes to the implementation of SD. As more fully discussed in the next section, dealing with climate change and SD,

125. THE LAW OF PEOPLES, *supra* note 114, at 17.

126. See Feldman, *supra* note 117.

127. Thomas W. Pogge, *The Incoherence Between Rawls's Theories of Justice*, 72 *FORDHAM L. REV.* 1739, 1743 (2004).

128. MARTHA C. NUSSBAUM, *FRONTIERS OF JUSTICE: DISABILITIES, NATIONALITY, SPECIES MEMBERSHIP* 236–244 (Harvard Univ. Press 2006).

129. THE LAW OF PEOPLES, *supra* note 114, at 23–30.

the principle of SD has been invoked and erroneously applied to the ADCs while the EOP in the LDCs have been ignored.

Rawls demonstrated how the law of peoples may be developed out of liberal ideas of justice similar to, but more general than, the idea of "justice as fairness" presented in *A Theory of Justice*.¹³⁰ Just as individuals in the first original position were shorn of knowledge about their attributes and placed behind a veil of ignorance to create principles for a just domestic society, the bargainers in the so-called second original position are representatives of peoples who are shorn of knowledge about their people's resources, wealth, power, and the like. Behind the veil of ignorance, the representatives of peoples—not states, since states lack moral capacity—develop the principles of justice that will govern relations between them: the Law of Peoples.

Rawls seeks to determine the principles of cooperation for such "well-ordered peoples." Rawls thinks non-ideal conditions cannot adequately be addressed unless principles of justice are determined for ideal conditions. Otherwise, it is impossible to know what kind of just society to aim to establish and the necessary means to do so.¹³¹ A "realistic utopia," as Rawls prefers to call his theory, is aspirational and does not reflect the existing reality of international law and relations. It is, however, possible to relate the Rawlsian ideal and square it with social reality in a functional manner that concentrates on those areas of the existing international framework that lend themselves to the Rawlsian ideal.¹³²

B. Burdened Societies and Duty of Assistance

A starting point for analyzing the international phenomena of the EOP must begin with the fact that the EOP should be identified primarily as "burdened societies"¹³³ in the Rawlsian sense. Rawlsian principles will ensure that SD is applied to the EOP. Furthermore, their special status as burdened societies must be highlighted rather than hidden. It also becomes important to draw attention to Rawls's suggestion on how the duty of assistance should be discharged, bearing in mind his particular conclusion that merely dispensing funds will not suffice to

130. *Id.* at 5, 60–71.

131. *Id.* at 128.

132. David Mitrany pioneered in conceiving of need-based responses by international organizations, which linked scientific knowledge, expertise, and technology, and created its own dynamic to provide a "functional" supra-national authority and basis for action. See DAVID MITRANY, *THE FUNCTIONAL THEORY OF POLITICS* (St. Martin's Press 1976).

133. THE LAW OF PEOPLES, *supra* note 114, at 106.

rectify basic and political injustice.¹³⁴ Rawls warns that the mere distribution of funds will not rectify the targeted problems now becomes of special relevance. Many rulers, Rawls points out, have been callous about the well-being of their own peoples,¹³⁵ and transferring resources to national governments does not ensure that they will be applied to the problems of the EOP. For this reason Rawls advocates that assistance be tied to the advancement of human rights. Tying assistance to human rights will also embrace the status of women who often are oppressed. It has, moreover, been proven that the removal of discrimination against women has resulted in major economic and social progress.¹³⁶

Such measures almost certainly will be resisted by authoritarian regimes that will argue this approach amounts to an intrusion into the national sovereignty of a country and violates international law. These rulers might fear that establishing human rights as a condition for helping the EOP will expose their own corruption and lack of good governance. Such rulers have reason to fear the granting of human rights where they have not confronted their problems or have demonstrated weak governance. As an example of this, Rawls cites to the works of Amartya Sen and Partha Dasgupta who have demonstrated that the main cause of famine in Bengal, Ethiopia, Sahel, and Bangladesh was government mismanagement rather than shortage of food.¹³⁷

Corruption remains a major problem in many developing countries, where large numbers of complex, restrictive regulations are coupled with inadequate controls.¹³⁸ In both ADCs and LDCs, people have learned to live with corruption, even considering it, fatalistically, as an integral part of their culture. Not only are official decisions—for instance, the award of government contracts or the amount of tax due—bought and sold, but very often citizens must pay for access to a public service or the exercise of a right, such as obtaining civil documents. The process of allocating political and administrative posts—particularly those with powers of

134. *Id.* at 108.

135. *Id.* at 109.

136. See generally, MUHAMMAD YUNUS, A WORLD WITHOUT POVERTY: SOCIAL BUSINESS AND THE FUTURE OF CAPITALISM (PublicAffairs 2007); MUHAMMAD YUNUS, BANKER TO THE POOR: MICRO-LENDING AND THE BATTLE AGAINST WORLD POVERTY (PublicAffairs 2003).

137. See generally, AMARTYA SEN, POVERTY AND FAMINES: AN ESSAY ON ENTITLEMENT AND DEPRIVATION (Oxford Univ. Press 1981); JEAN DREZE & AMARTYA SEN, HUNGER AND PUBLIC ACTION (Oxford Univ. Press 1989); PARTHA DASGUPTA, AN INQUIRY INTO WELL-BEING AND DESTITUTION (Oxford Univ. Press 1995).

138. Corruption refers to the use of public office for private gain where an official entrusted with a public task engages in some sort of malfeasance for private gain. Pranab Bardhan, *Corruption and Development: A Review of Issues*, 35 J. ECON. LITERATURE 1321(1997).

decision over the export of natural resources or import licenses—is influenced by the gains that can be made from them.¹³⁹ As these exchanges of privileges are reciprocated by political support or loyalty, it cements the political foundations.¹⁴⁰ Corruption in turn takes its toll on the countries as a whole. It has been estimated, for example, that moving from a relatively “clean” government like that of Singapore to one as corrupt as Mexico’s would have the same effect on foreign direct investment as an increase in the marginal corporate tax rate of fifty percent.

What this proves is that developed countries play a dominant part in alleviating the condition of the EOP, as required by SD. It also invokes the need for action by national governments. Justice requires both that assistance be given and that such assistance be properly administered. The failure of foreign aid has been debated,¹⁴¹ and better ways of granting assistance must be found. Justice also requires that national governments take on the task of addressing the EOP. It is not possible to lay the blame on avaricious rich countries alone.

What about costs? The costs of the MDGs call for comparison with those spent on mitigating GHGs. According to Goklany, who based his calculations on the lowest estimates produced by the IPCC’s 2001 report,¹⁴² the costs of reducing GHG emissions to 1990 levels is U.S. \$165 billion per year.¹⁴³ Bjorn Lomborg concludes it is U.S. \$180 billion.¹⁴⁴ The Stern Report estimates that the cost of stabilizing GHGs at levels of 500-550ppm of CO₂—a far more ambitious endeavor—will cost about one percent of annual GDP by 2050.¹⁴⁵ The Stern Report has

139. The link between political and economic power can be direct, such as in the system of patrimonialism in Morocco, or indirect too, such as in the Philippines where political position in a patronage-based system can be bought and sold.

140. Irène Hors, *Fighting Corruption in the Developing Countries*, OECD OBSERVER NO. 220, April 2000, available at http://www.oecdobserver.org/news/printpage.php/aid/291/Fighting_corruption_in_the_developing_countries.html (last visited May 3, 2010).

141. See generally, WILLIAM EASTERLY, *THE WHITE MAN'S BURDEN: WHY THE WEST'S EFFORTS TO AID THE REST HAVE DONE SO MUCH ILL AND SO LITTLE GOOD* (Penguin Group 2006).

142. See generally, IPCC, *CLIMATE CHANGE 2001: SYNTHESIS REPORT* (2001), http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/vol4/english/index.htm (last visited May 3, 2010).

143. Indur M. Goklany, *What to Do about Climate Change*, 609 POLICY ANALYSIS 16 (2008), available at <http://www.cato.org/pubs/pas/pa-609.pdf>.

144. Bjorn Lomborg, *Global warnings: The Copenhagen protocol will not succeed unless China and India sign up, but bribing these nations to take part is counter-productive*, GUARDIAN, Feb. 15, 2009, available at <http://www.guardian.co.uk/commentisfree/2009/feb/13/climatechange-carbonemissions> (last visited May 3, 2010).

145. NICHOLAS STERN, *THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW*

been criticized as woefully underestimating the true costs of the carbon dioxide reductions it calls for,¹⁴⁶ but those figures will be assumed as correct. Estimating GDP at 35 trillion dollars, this would cost \$350 billion per year. The contrast between the costs of reducing carbon dioxide and meeting the MDGs is sobering. It would cost \$3 billion per year to reduce malaria by seventy-five percent,¹⁴⁷ and the first MDG goal of reducing income poverty and hunger by fifty percent reduction of hunger could be achieved at a cost of \$39 to 54 billion per year.¹⁴⁸ According to the World Bank, the additional cost of attaining all the MDGs is approximately \$40 to 70 billion,¹⁴⁹ which is around a third of the cost of implementing the Kyoto Protocol.

A pressing question arising from Rawlsian ideology pertains to SD and global warming. To what extent can developed countries discharge their duty of assistance to burdened societies by funding ADCs to cut down GHGs? The next section argues that developed countries are circumventing and evading their duty of assistance by confining their financial and technological help to ADCs for GHG mitigation and adaptation measures.

V. SUSTAINABLE DEVELOPMENT AND GLOBAL WARMING

According to its proponents, the rationale for regulating carbon dioxide is a legitimate application of the principle of SD, because carbon

239 (Cambridge Univ. Press 2006) [hereinafter STERN REPORT] (See also Executive Summary) http://web.archive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/d/Executive_Summary.pdf

146. See Bjorn Lomborg, *Stern Review: The Dodgy Numbers Behind the Latest Global Warming Scare*, WALL ST. J., Nov. 2, 2006, available at <http://www.opinionjournal.com/extra/?id=110009182> (last visited May 3, 2010); William Nordhaus, *Critical Assumptions in the Stern Review on Climate Change*, 317 SCIENCE 201 (2007).

147. AWASH TEKLEHAIMANOT, ET AL., COMING TO GRIPS WITH MALARIA IN THE NEW MILLENNIUM 2, (U.N. Dev. Programme 2005), available at <http://www.unmillenniumproject.org/documents/malaria-complete-lowres.pdf>.

148. WORLD BANK, THE COSTS OF ATTAINING THE MILLENNIUM DEVELOPMENT GOALS available at <http://www.worldbank.org/html/extdr/mdgassessment.pdf>. Also See PEDRO SANCHEZ, ET AL., HALVING HUNGER: IT CAN BE DONE 31, (U.N. Dev. Programme 2005), available at <http://www.unmillenniumproject.org/documents/Hunger-lowres-complete.pdf>.

149. WORLD BANK, ACHIEVING THE GOALS available at http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTHEALTHNUTRITIONANDPOPULATION/EXT_HNPMDS/0,,contentMDK:20283934~menuPK:975723~pagePK:64207168~piPK:64207060~theSitePK:563129,00.html.

dioxide is the pollutant most responsible for global warming. Furthermore, the effects of global warming will impact the poorest countries of the world most severely. Proponents argue that scientific assessments demonstrate that global warming disproportionately afflicts the EOP because they are unable to adapt to changes in climate, increased droughts, or rising seas. Millions of EOP, particularly in Africa, face some of the biggest risks from disease, drought, and disrupted water supplies. As the oceans swell with water from melting ice sheets, the crowded river deltas in Asia and Egypt, along with small island nations, are most at risk. While developed countries are hardly immune from drought and flooding, their wealth will largely insulate them from severe harm, at least for the next generation or two. Some advocates targeting global warming point out that the position of the EOP is exceptionally perilous. They argue that the way forward must therefore lie in concentrating global action on mitigating the effects of GHGs. The claim that global warming is the greatest problem facing burdened societies is unfounded and unsubstantiated. While global warming is a serious problem, it is certainly not the most important public health, ecological or bio-physical problem facing the EOP. The alleged devastation caused to the EOP in three areas is dealt with briefly in the next three sections.

A. Health

To begin with health, the WHO has issued a number of reports on the comparative quantification of disease caused health risks based on mortality and disability adjusted life years ("DALY's"). Of the twenty-eight diseases and conditions that increased the chance of mortality and DALYs, global warming ranked below the top twenty.¹⁵⁰ Underweight caused by hunger, unsafe drinking water, poor sanitation, diseases, vitamin A deficiency, poor nutritional intake and indoor air pollution, all ranked higher than global warming.

In this context, it has been argued hunger and malaria are among the foremost threats to health aggravated by global warming. The extent to which hunger and malaria are intensified by global warming was addressed by two internationally influential reports published by the UK

150. See, e.g., WHO, *Risk Factors*, available at http://www.who.int/healthinfo/global_burden_disease/risk_factors/en/index.html (last visited Mar. 20, 2010); WHO, *World Health Report 2002: Reducing risks, promoting life*, available at <http://www.who.int/whr/2002/en/> (last visited March 20, 2010); WHO, *Comparative Quantification of Health Risks*, available at http://www.who.int/healthinfo/global_burden_disease/cra/en/ (last visited Mar. 20, 2010).

government: Fast Track Assessments (“FTA”)¹⁵¹ and the Stern Review on the Economics of Climate Change.¹⁵² Upon examination of the reports, a perspicacious commentator found the figures attributing additional risks to hunger and malaria from global warming to be inflated, but accepts them nonetheless.¹⁵³ He then shows how total mortality from hunger, malaria and extreme events will not exceed seven percent for the coolest Intergovernmental Panel on Climate Change (“IPCC”) scenarios, and thirteen percent for the warmest IPCC scenarios.¹⁵⁴

B. Water Stress

Water stress occurs when the demand for water exceeds the available amount during a certain period or when poor quality restricts its use. Lack of supply is often caused by contamination, drought, or a disruption in distribution. Water stress causes deterioration of fresh water resources in terms of quantity by aquifer over-exploitation, dry rivers, and quality leading to eutrophication, organic matter pollution, and saline intrusion.¹⁵⁵ An assertion by the IPCC Summary for Policy Makers that global warming will expose hundreds of millions to increased water stress¹⁵⁶ misrepresents the full facts and is misleading. The full report of the IPCC on which this summary purports to be based tells a different story. According to the full report: “An analysis of six climate models . . . and the SRES scenarios . . . shows a likely increase in the

151. See Martin L. Parry, et al., *Effects of Climate Change on Global Food Production Under SRES Emission and Socio-Economic Scenarios*, 14 GLOBAL ENVIRONMENTAL CHANGE 53, (2004), available at http://www.preventionweb.net/files/1090_foodproduction.pdf.

152. See STERN REPORT, *supra* note 145.

153. Indur Goklany, *Global Health Threats: Global Warming in Perspective*, 14 J. OF AM. PHYSICIANS AND SURGEONS 69, 69 (Fall 2009).

154. In its attempt to depict possible futures in the face of evolving dynamics based on changing social, economic, technological and political facts, the IPCC, after a five-year study, completed a Special Report on Emission Scenarios (“SRES”) in March 2000, presenting a cluster of scenarios based on differing “story lines.” The report posited six possible emission scenario groups, all beginning in 2000 and ending in 2100, which were included in the Fourth Assessment Report in 2007. The six scenario groups each represent a different combination of population growth, energy intensity and alternative energy adoption. Together these factors help determine future GHG emissions and therefore the severity of future climate change.

155. U.N. Env’t Programme (“UNEP”), Glossary, available at http://www.grid.unep.ch/product/publication/freshwater_europe/glos.php (last visited May 3, 2010).

156. IPCC, *Climate Change 2007: Working Group II: Impacts, Adaption and Vulnerability*, Ch.9 4.1 (2007), available at http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch9s9-4-1.html (last visited March 20, 2010).

number of people who could experience water stress by 2055 in northern and southern Africa . . . In contrast, more people in eastern and western Africa will be likely to experience a reduction rather than an increase in water stress . . . ”¹⁵⁷ FTA research confirms that even more millions will experience reduced water stress.¹⁵⁸ This is because global warming will increase precipitation, and although some areas will have less, there will be increased rain in the more populated parts of the world.¹⁵⁹

Nonetheless, there is no doubt that water stress presents a huge problem in sub-Saharan Africa. A report of the Council on Foreign Relations points out that while water stress occurs throughout the world, no region has been more afflicted than sub-Saharan Africa.¹⁶⁰ It goes on to attribute water stress to weak governments, corruption, mismanagement of resources, poor long-term investment, and a lack of environmental research and urban infrastructure. Global warming is not mentioned. One of the primary conclusions of this report is that economic development, incorporating water infrastructure, is necessary to end the severe problems caused by water stress and to improve public health and advance the economic stability of the region.¹⁶¹ Consequently, what is required for the EOP who inhabit sub-Saharan Africa is more development within the framework of SD. Cutting down of carbon dioxide emissions is largely irrelevant to their present plight.

C. Sea Level Rise

The rise in sea level has received popular press and cinematic attention and serves as a proxy for the most certain and most damaging consequences of global warming. According to the IPCC's 2007 Physical Basis report, the rise in sea level corresponds with rising temperatures, and seas have risen by an average of 1.8 millimeters per year between 1961 and 2003. This is less than 5 centimeters over the whole period with higher sea rises (about 3 centimeters) from 1993 to 2003. The IPCC cannot tell if the higher sea level rises from 1993 to 2003 reflect a long-term trend. They consider it “very likely” that ice sheet losses from Greenland and Antarctica contributed—though they cannot say by how

157. *Id.*

158. See Parry, *supra* note 151.

159. See Oki T and Kanae S, *Global Hydrological Cycles and World Water Resources*, 313 *SCIENCE* 1068–1072 (2006).

160. See Christopher W. Tatlock, *Water Stress in Sub Saharan Africa*, Council on Foreign Relations (2006), available at <http://www.cfr.org/publication/11240/> (last visited May 3, 2010).

161. *Id.*

much—to the higher sea levels between 1993 and 2003.¹⁶² The IPCC concluded that the total contribution of snow, river and lake ice, sea ice glaciers, ice caps, ice sheets and frozen grounds (the cryospheric component) ranged from 0 to 0.2 centimeters between 1961 and 2003, and from 0.08 to 0.16 centimeters between 1993 and 2003.¹⁶³

While the Greenland ice pack has melted at its fringes, the extent to which it has done so has been the subject of numerous studies, models, and predictions. None of the predictions posit rises higher than 3 millimeters per year by the end of the century which amounts to about 30 centimeters over 100 years. The IPCC estimates that Greenland is expected to contribute 3.5 centimeters over the century by itself, while other studies indicate Greenland's ice may be less susceptible to massive meltdown predicted by computer models of climate change.¹⁶⁴

The importance of Greenland ice melt in the alleged impacts of sea level rises have been graphically demonstrated by former Vice President Al Gore's academy award-winning, apocalyptic film: *An Inconvenient Truth*. The film suggests that Greenland could melt or break up and slip into the sea—or half of Greenland and half of Antarctica could melt or break up and slip into the sea. It then shows how the resulting sea level rises inundate large parts of Florida, including all of Miami, flood San Francisco Bay, wipe out the Netherlands, submerge Beijing and then Shanghai, make Bangladesh uninhabitable for 60 million people, and deluge even New York and its World Trade Center Memorial.

But this scary scenario—based on tendentious assumptions—is not corroborated by existing scientific studies. Bjorn Lomborg, who believes that the consequences of global warming have been “vastly exaggerated” relies on the Greenland studies to point out that none of them posit rises higher than 3 millimeters per year by the end of the century, whereas Gore's claim—even within the span of a century—would need to raise sea levels around Greenland to 120 millimeters. This is forty times

162. IPCC, *Climate Change 2007: Synthesis Report Summary for Policymakers*, 5–7 (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf (last visited May 3, 2010).

163. IPCC, WORKING GROUP I REPORT: THE PHYSICAL SCIENCE BASIS OF CLIMATE CHANGE 340 (2007) [hereinafter WORKING GROUP I REPORT].

164. Eske Willerslev et al., *Ancient Biomolecules from Ice Cores Reveal a Forested Southern Greenland*, SCI., July 6, 2007 at 111-14. Colin Nickerson, *Greenland Ice Yields Hope on Climate, DNA Hints Warm Era Didn't Melt Entire Cap*, BOSTON GLOBE, July 6, 2007, at 1A, available at http://www.boston.com/news/local/articles/2007/07/06/greenland_ice_yields_hope_on_climate. According to the principal author of this international study “This may have implications for how the ice sheets respond to global warming. They may withstand rising temperatures.”

higher than the very highest model estimate.¹⁶⁵

In its report, the IPCC raises the question: How likely are major or abrupt climate changes, such as loss of ice sheets or changes in global ocean circulation? It then answers: "Abrupt climate changes, such as the collapse of the West Antarctic Ice Sheet, the rapid loss of the Greenland Ice Sheet or large scale changes of ocean circulation systems, are not considered likely to occur in the 21st century based on currently available model results . . ." ¹⁶⁶

In summary, even if it is possible to reduce carbon dioxide emissions to between five and seven percent below 1990 levels it would reduce mortality from hunger malaria and extreme events in 2085 by thirteen percent under the warmest IPCC scenarios, while exposing 1.2 billion people to water stress.¹⁶⁷ Water stress is a major problem in sub-Saharan Africa, but the causes for it are political and economic, and the cure lies in more economic and social development not the cutting down of carbon dioxide emissions. The impact of global warming on sea level rises is certain but will not be devastating in the foreseeable future.

D. ADCs and SD

Geopolitically, even though the world now focuses on global warming and not the MDGs, the rhetoric of SD continues to be used in the climate change negotiations. The primary negotiating position of the ADCs is that they need to burn more coal and emit more carbon dioxide emissions to advance SD. China and India, who act as proxies for other ADCs, claim that reducing carbon dioxide emissions will obstruct SD. India's external affairs Minister Pranab Mukherjee recently stated that while India is very concerned about climate change, that issue needs to be seen in the perspective of the imperative to remove poverty so that all Indians can live a life of dignity.¹⁶⁸ Similarly, Chinese premier Wen Jiabao stated that "it's difficult for China to take quantified emission reduction quotas at the Copenhagen conference, because this country is still at an early stage of development. Europe started its industrialisation several hundred years ago, but for China, it has only been dozens of

165. See Al Gore, *Testimony Before a Joint Meeting of U.S. House Subcommittees on Energy and Air Quality, and Energy and Environment* (Mar. 21, 2007).

166. WORKING GROUP I REPORT, *supra* note 163, at 818.

167. Goklany, *supra* note 153 at 73.

168. Pranab Mukherjee, *Climate Treaty Shouldn't Impose Greater Burden*, THAIANDIAN NEWS, Feb. 5, 2009, available at http://www.thaindian.com/newsportal/uncategorized/climate-treaty-shouldnt-impose-greater-burden-pranab-mukherjee_100151361.html (last visited May 3, 2010).

years.”¹⁶⁹ India and China object to limitations on their rights to SD.

Conversely, ADCs offer an alternative argument based on the feasibility of moving to sustainable energy. If the developed countries want them to take a path to SD based on sustainable energy, ADCs argue that the developed countries should provide them with the necessary financial and technological transfers that will enable them to do so. In the Copenhagen Accord, developing countries pledged to commit \$30 billion during the period 2010 to 2012 and to further mobilize \$100 billion per year by 2020 to be used for mitigation and adaptation.¹⁷⁰ This would be in addition to what developed countries spend on the mitigation of carbon dioxide.

The distribution of resources in this manner is difficult to justify on ethical grounds. It is erroneous to rationalize. Spending scarce resources on the industrial sectors of advanced developed countries, that are in fact served by high energy based on fossil fuels, is ethically dubious. These ADCs have advanced up the energy ladder, in contrast to those who are trapped at the bottom of the energy ladder. A recent report of the UNDP focused on the LDCs and Sub Saharan Africa paints a grim picture of the extent to which these countries and their peoples lack access to energy.¹⁷¹ They conclude that, “[a]lthough energy access varies widely across developing countries, it is much lower in poorer developing countries than in other developing countries, *placing poorer countries at a huge disadvantage. Seventy-nine percent of people lack electricity in LDCs and seventy-four percent in sub-Saharan Africa compared to twenty-eight percent of those in developing countries as a whole.*”¹⁷²

EJ calls for a different approach and a new consensus. First, unlike the Copenhagen Accord, the new consensus should not be fixated on the reduction of GHG emissions alone and should instead be focused on SD as a way of combating global warming. The interdiction of black carbon, which is not a GHG, should be included in the new consensus. This will help to address indoor pollution as well as global warming. Second, unlike the Copenhagen Accord, there should be a specific reference to the EOP and an emphasis on how a significant part of the resources committed by developed countries should be devoted to EJ and SD.

As burdened societies in the Rawlsian sense, the EOP are owed assistance by both developed and developing countries until they are capable of integrating into the liberal democratic or well-ordered hierarchical society that controls their geographical area. Of course, the

169. Lomborg, *supra* note 146.

170. Copenhagen Accord, *supra* note 6, art. 8.

171. See LEGROS ET AL., *supra* note 9.

172. *Id.* at 1(emphasis added).

amount and type of assistance required from developed and developing countries will differ from one segment of the EOP to another depending upon the needs of the EOP and the capabilities of the developing state. Like responsibility for climate change, the responsibility for assistance to the EOP is common to all peoples, but differentiated by ability to help.

Rapidly developing ADCs such as Brazil, China, and India must mobilize their governments to provide administrative support to internationally-based sustainable energy programs from developed countries and the UN to the EOP. Indeed, without action from the domestic government to promote the rule of law and provide a framework for organization of labor, capital, and energy (through markets or otherwise) to the EOP, international technological and financial assistance such as disseminating ASETs or microfinancing will fall flat. The primary concern of ADC governments is development for their populations; that development must, according to the law of peoples, include not only their rising middle classes, but the impoverished burdened society they have hitherto left behind.

While the EOP may reside within the borders of the ADCs, the obligation of the liberal or decent peoples in the ADC to assist them resides in the law of peoples. The division of responsibility here is relatively clear. Developed nations should provide resources that facilitate the advancement of knowledge and the adoption of intermediate energy technologies that improve the energy conversions of the EOP. For their part, the ADCs should provide the administrative, managerial, and legal frameworks for advancing the behavioral changes leading to the adoption of those technologies, and thereby raising the EOP out of poverty so that they might integrate into the larger society. The importance of managerial and administrative assistance by the ADCs to the EOP cannot be ignored.

But because LDCs lack the financial resources of ADCs, and the EOP constitute a far larger proportion of the population of LDCs, developed nations bear a greater responsibility for ensuring that the assistance they provide actually reaches the EOP in LDCs. Such a responsibility is a corollary to the primary duty of liberal and decent peoples to assist burdened societies. It is not enough to provide cookstoves, treadle-pumps, and bio-intensive agriculture plans to the governments of LDCs as part of foreign aid or assistance. Too often such assistance is based on the assumption that recipient governments have the resources and knowledge to publicize, organize, and administer those technologies in ways that both reach and impact the EOP. But that, equally often, is not the case. This kind of aid often fails to satisfy the duty of assistance to burdened societies, because it may never reach those who need it, or have any significant impact on their lives.

Developed nations providing sustainable energy assistance must not only promote appropriate sustainable energy technologies, but also work with the LDC governments to create the administrative, managerial, and legal frameworks for publicizing, educating, and training the EOP on how to utilize them. Developed nations must work sensitively with LDC governments to create and maintain these frameworks in a way that does not challenge the self respect or sovereignty of the LDCs. Furthermore, administrative and legal frameworks for mainstreaming energy technologies to the EOP must be crafted in ways that comport with the culture, religion, and values of the burdened EOP. A developed country's stipulation of administrative requirements attached to technological aid extends only to advance the "common institutions and practices of all liberal and decent societies," with the "final aim of assistance: freedom and equality for the formerly burdened societies."¹⁷³

Rawls concluded that the law of peoples "will restrict a state's internal sovereignty or (political) autonomy, its alleged right to do as it wills with people within its own borders. . . . [W]e must therefore reformulate the powers of sovereignty in light of a reasonable Law of Peoples and deny to states the traditional rights to war and unrestricted internal autonomy."¹⁷⁴ As discussed, sovereignty cannot be a shield thwarting measures to address the crushing toll of death and suffering borne by the EOP.

This view of diminished importance of absolute sovereignty stems directly from Rawls's focus on peoples rather than states. States are instrumentalities for carrying out the rights and duties of peoples. They are not sacrosanct in their authority if that authority is being used in violation of the law of the peoples. While it would be unduly imperialistic for a developed nation to require an LDC to import a governmental framework that does not comport with its political culture, a state has no right to accept technological or financial assistance on behalf of a burdened society living within its borders and then fail to implement it. The moral conscience of the liberal democratic or decent hierarchical people cannot permit a state to act in such a way.

VI. CONCLUSION

Two thirds of the world in developed countries and ADCs are high energy users who rely primarily on hitherto abundant sources of fossil fuels for their prosperous life styles. They are responsible for problems of global warming and peaking oil. By contrast, the primary energy

173. THE LAW OF PEOPLES, *supra* note 114, at 111.

174. *Id.* at 26.

relied on by the “other” third of the world, numbering around two billion peoples, is biomass-based fire. They are the EOP who do not reside in the industrial high energy using sectors of advanced developing countries. Instead they inhabit the rural or peri-urban parts of the world and emit hardly any carbon dioxide. Their abject poverty and ill health, attributable to the absence of sustainable energy, cries out for SD and energy justice, but their cry has been unheard and unheeded.

The application of the true Rawlsian paradigm of EJ underlying SD will ensure, first, that the duty of assistance be exercised in a manner conferring direct benefit on the EOP residing primarily in the LDCs, and some ADCs, but not the governments of ADCs. Second, a Rawlsian duty of assistance will provide for energy conversions that advance sustainable development, while rejecting unsustainable development of the kind relied on by the other two-thirds of the world. Consequently, the socioeconomic development of the EOP resulting from such assistance will not foul the planet with more pollutants or inflict disease and death in the way that traditional coal-based power plants do. Third, such assistance will advance technologies, that are sympathetic to the cultural mores, and technological knowledge baseline of the EOP. Fourth, such technologies should empower women to take the vanguard in economic development and the generation of income. Finally, in practical terms, the use of cookstoves will help address the nearly two million premature deaths primarily of women and children.

Remedial action based on SD can begin with tackling indoor and atmospheric pollution but should extend far beyond that single measure to provide the EOP with sustainable energy that will enable them to develop and break the bonds of poverty and energy deprivation. Moreover, the abatement of black soot emitted by the burning of biomass by using cookstoves has the extraordinary co-benefit of reducing global warming. A dollar spent on eliminating black soot will have the double benefit of improving human health as well as of mitigating global warming, thereby benefiting not only to the EOP but the entire world. Even those developing countries driven by rational self interest alone may find it advantageous to finance such an efficient way of mitigating global warming. But other problems afflicting the EOP such as poor sanitation, lack of drinking water, absence of education or gender inequality, may not possess such epiphenomenal consequences.

The daunting prospect of adding the energy demand and polluting emissions of 2 billion developing people to a global environment groaning under the load of traditional hydrocarbon energy generation can be avoided with ASETS.¹⁷⁵ Using ASETs to address the devastating

175. The case for doing so has been argued elsewhere: *See Guruswamy, supra* note 109.

effects of burning biomass only represents the beginning of a journey. It is a first step toward creating a more comprehensive basis for the energy-based sustainable development of the EOP. In other words, helping one-third of the world to address the public health crisis posed by indoor air pollution can also embark the EOP on a different developmental pathway that bypasses the problems created by the other two-thirds of the world.

