

REPRODUCTIVE LIBERTY AND OVERPOPULATION\*

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Abstract:

This essay argues that 1) there is an imminent threat to survival posed by the human environmental deficit, and sustainability will require population reduction as well as changes in consumption; 2) reproductive liberty should not be considered a fundamental human right, or certainly not an infeasible right; 3) a global agreement to address the “tragedy of the commons” should include the option of coercive measures to reduce population to a sustainable level.

In 1996, the Ecological Society of America hosted a major conference on population growth which concluded: “There is general agreement throughout the scientific community that growth of the human population, and the resultant increase in consumption, is exerting an unsustainable amount of pressure on global [eco] systems”(Kearns 1997: 163). This warning echoed the concern raised by the U.S. National Academy of Sciences in 1994 that “Humanity is approaching a crisis point with respect to the interlocking issues of population, natural resources, and sustainability”(NAS 1994). In 1992, the U.S. National Academy of Sciences and the Royal Society of London issued a joint statement warning that science and technology could not be counted on to avoid *irreversible* environmental degradation and widespread poverty (NAS 1992). The same year, the Union of Concerned Scientists issued a “World Scientists Warning to Humanity” signed by 1,600 of the world’s top scientists, including 102 Nobel Prize winners, saying that destructive human activities “may so alter the living world that it will be unable to sustain life in the manner that we know,” and that human behavior must change “if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated” (UCS 1992). In 2000, Worldwatch Institute issued this chilling assessment:

“ The projected growth in population over the next half-century may more directly affect economic progress than any other single trend, exacerbating nearly all other environmental and social problems....the trend that will most affect the human prospect is an irreversible one – the accelerating extinction of plant and animal species....As human population grows,...*at some point we will face wholesale ecosystem collapse*....The risk in a world adding nearly 80 million people annually is that so many sustainable yield thresholds will be crossed in

such a short time that the consequences will become unmanageable (italics added)  
(Brown 2000: 5,8,13).

Noted ecologist Edward Goldsmith warns that the Western life-style of mass-consumption is “ecologically doomed,” because “the biosphere is incapable of sustaining all six billion of us at the consumption levels of the North.” and, if human demands are not reduced, the planet may become “incapable of sustaining complex forms of life” within fifty years (Goldsmith 1996: 81).

William Rees, who, with Mathis Wackernagel, pioneered the concept of an ‘ecological footprint’<sup>1</sup> as a measure of the environmental impact of human population and consumption, has concluded that aggregate human load (resource harvesting and waste generation), “already exceeds, and is steadily eroding, the very carrying capacity upon which...continued humane existence depends”(Rees 1996: 199). Yet, despite mounting evidence of a threat to humane survival<sup>2</sup> posed by a growing ecological deficit,<sup>3</sup> the paradigm of continuous economic growth, in a form increasingly dominated by the global production chains and mass-marketing strategies of transnational corporations,<sup>4</sup> remains firmly entrenched.<sup>5</sup>

While scientists debate the precise carrying capacity of the planet, the accelerating risk of ecosystem collapse urgently requires our species to resolve a dilemma which Garrett Hardin called “the tragedy of the commons”(Hardin 1968). The environment, with its ultimately limited resources of land, clean air and water, food, and so on, is treated as a ‘commons’ when it is viewed as an unpriced asset which may be freely used by all (Costanza *et al*1997). The inevitable result of this *laissez-faire* approach is the eventual exhaustion of shared resources, as each individual acts to maximize his gain. Hardin applied this analysis to population (“freedom to [over] breed”), though it is easily generalized to include a system of production and

consumption which in a similar way exploits the environment as a “free good.” The solution is an enforceable rational agreement to regulate the commons, that is, “mutual coercion mutually agreed upon” to limit reproduction and, by extension, the unsustainable use of environmental resources in production and consumption.

Reducing population to a sustainable level (at some desirable level of consumption), would obviously require a major global effort, not merely to subsidize and distribute effective modern contraceptives, but to offer incentives and impose penalties to influence fertility, manipulate institutional variables,<sup>6</sup> aggressively counter pronatalist cultural values, and, very likely, impose coercive limits on reproductive liberty. However, some or all of those measures have been strongly opposed by many religious conservatives and by an influential bloc of left-liberal and feminist advocates of ‘reproductive liberty’. The contentious 1994 UN International Conference on Population and Development in Cairo declared reproductive liberty to be a human right, and shifted the focus of development efforts from population programs to women’s reproductive health (UNICPD 1994). In this political climate, it is perhaps not surprising that the September 2002 U.N. World Summit on Sustainable Development produced a long list of proposals to achieve sustainable economic growth without a single mention of sustainable population *levels*.

This essay will argue that: 1) there is an imminent threat to survival posed by the human environmental deficit, and sustainability will require population reduction as well as changes in consumption; 2) reproductive liberty should not be considered a fundamental human right, or certainly not an infeasible right; 3) a global agreement to address the tragedy of the commons should include the option of coercive measures to reduce population to a sustainable level.

## 1. The Harm of Unsustainable Population and Consumption

The U.N.'s revised 2000 population projection estimated world population (about 6.3 billion in 2003), would swell to between 7.9 and 10.9 billion by 2050. The medium estimate <sup>7</sup> of 9.3 billion by 2050 was expected to stabilize at about 10 billion by the end of the century, or, on the high estimate, about 12 billion (UNPD 2001; Bongaarts 2002). Contrary to the common perception that the medium forecasts are “more probable” than the low or high estimates, a recent National Research Council study concluded that a 95-percent prediction interval for world population in 2050 would extend from 7.9 to 10.9 billion (NRC 2000:10,191). <sup>8</sup>

The U.N.'s 2002 population revision projects a world population of 7.4 to 10.6 billion by 2050, with a medium estimate of 8.9 billion (UNPD 2003). The estimate reflects the judgment of demographers assembled to advise the Population Division in March 2002, <sup>9</sup> taking into account evidence of a worsening impact of HIV/AIDS and indications that the total fertility rate (TFR) in intermediate-fertility countries <sup>10</sup> may fall below replacement level before 2050. However, at that meeting, Joseph Chamie, Director of the Population Division, stressed that “world population growth is not over....Population momentum <sup>11</sup> will cause world population growth to continue for many decades even if the level of fertility in the intermediate-fertility countries falls below replacement by 2050” (UNPD 2002:19). Griffith Feeney, conference rapporteur, presented an overview of conference themes and emphasized the point that : “We have not seen the end of huge population growth....We are in the middle of a century of rapid world population growth. The end is in sight, but it is still at least 50 years away. To dismiss world population

growth as a fundamental issue for the future of humanity is absurdly short sighted and could incur a terrible human cost” (UNPD2002:21).

The demographer John Caldwell also expressed fear that complacency about a smooth demographic transition<sup>12</sup> could jeopardize critical support for population programs, which in turn could make the difference between a future population of 8 or 12 billion people ( Caldwell 2002:72, 73, 78). “My point ...is that the rich nations should still be primarily concerned with world population growth....The peak global populations could range between 9 and 12 billion....With regard to the long-term stability of the world’s ecosystems and our ability to feed everyone adequately and to give them a reasonably good life, that margin of 3 or 4 billion extra people may be critical” (Caldwell 2002:75).

Population in the developed regions will remain virtually constant (or even fall), until 2050, but less developed countries are projected to grow from about 4.9 billion in 2000 to some level between 6.3 and 9.3 billion in 2050. Population in the 48 least developed countries will double or triple, from about 668 million in 2000 to somewhere between 1.4 to 2 billion in 2050. Africa will grow from about 13% of world population in 2000 to over 20% by 2050 (UNPD 2003: Table 1). John Bongaarts has underlined the point that “the historically unprecedented population expansion in the poorest parts of the world continues largely unabated” (Bongaarts 2002:68).

Development organizations such as the International Monetary Fund (IMF) typically prescribe “sustained and rapid economic growth” through the creation of “market-friendly institutions” as a cure for poverty (IMF 2000:185). Problems associated with rapid population growth (resource scarcity, environmental damage), are thought to reflect short-term problems,

stemming from poor economic and social policies, which can be resolved by better technology and further economic development.<sup>13</sup> Optimists note that world output growth (total world GDP) has increasingly exceeded population growth in the 20<sup>th</sup> century, largely as a result of accelerating technical progress (IMF 2000:ch.5).<sup>14</sup> Nations in which population growth has not been matched by economic development are urged to improve their productive capacity and incomes through market reforms, free trade, and adoption of new technology (IMF 2000: ch. 5).

There are at least two major ecological objections to this growth prescription. First, ecologists have vigorously contested the claim that technology can provide substitutes for all scarce, and critical, resources, and that food production in particular can keep pace with population growth without unacceptable environmental damage. Of course it's always possible that some new technologies will emerge to mediate the environmental impact of population and consumption.<sup>15</sup> However, ecologists have estimated that an absolute reduction of up to 50% in the human load currently imposed on ecosystems would be required for ecological sustainability, and that high income countries would have to reduce their ecosystem demands by 80% or more to create "ecological space" for growth in developing countries (Rees 2002:41). Technology to achieve this goal does not appear to be on the horizon. Therefore, prudence would suggest a direct focus on eco-compatible population and consumption levels. If the economic optimists turn out to be right, efforts to reduce population and consumption will have made the planet healthier and less crowded. But if they are wrong, the planet, and our own species among others, will pay an unacceptable price for growth

The second objection is that even if every nation on the planet rapidly adopted "efficient" free market and free trade policies, and even assuming such policies "worked" to accelerate

global economic growth, the result, given current and, certainly, projected population levels, would be an impossibly large ecological deficit. Humanity's ecological footprint has been estimated to exceed long-term global carrying capacity as much as 40% (Rees 2002:40).<sup>16</sup> Humanity currently appropriates an unsustainable 25-35% of coastal shelf primary production (Rees 1996:198), and over 50% of the Sun's energy captured by the entire plant biomass on Earth each year (Pimentel *et al* 1999:30). William Rees estimated that if the world population of 5.8 billion (in 1996) lived at *unsustainable* North American consumption levels, two additional planet Earths would be required to accommodate the ecological load. With a population of 10 or 11 billion, 5 additional Earths would be needed simply to maintain the present rate of ecological *decline* (Rees 1996:210).

Optimistic economists have argued that the neo-Malthusian perspective<sup>17</sup> in claims about "carrying capacity" limits for human population reflects excessive pessimism (i.e. "alarmism") (UNPD 2001a:75-76; Sen 1996). The UN's *World Population Monitoring 2001* report argues that environmental harm is caused by a number of factors, including population, consumption, technology, and social-institutional factors, and that it's not possible to assign exact measures of blame to each variable (UNPD 2001a: ch.4, 8, Annex II). Moreover, since estimates of carrying capacity have ranged from 1 to 1,000 billion people, the report questions the credibility of this approach (UNPD 2001a: 30-31). Furthermore, more efficient markets, better social policies (to promote "equitable income growth"), conservation measures, factor substitution, and new technology have the potential to increase the supply of critical resources well beyond most estimates of carrying capacity (UNPD 2001a:30,38). For example, a 1994 Food and Agriculture Organization (FAO) study concluded that with "high inputs to agriculture

such as full mechanization and optimal application of fertilizers and chemical controls for pests, diseases and weeds” *developing countries* had a carrying capacity of 33 billion people (UNPD 2001a:76). (Do such estimates undermine the FAO’s credibility?) However, though the UN’s report downplays direct effects of population size, it does concede that, other things being equal, increasing population size plays a role in increasing aggregate economic demand, hence the volume of pollution-causing production. For that reason, population policies can enhance long-term human welfare (UNPD 2001a:38-39).

Despite the constant appeal to “mediating factors,” the 2001 UN report does not entirely endorse an optimistic outlook for the environment. It acknowledges the reality of significant environmental damage from agricultural intensification, the unresolved problem of global warming, a pessimistic outlook for commercial fish stocks, water scarcity, and loss of forests and biodiversity, all of which have at least some relation to population pressures. “Ecosystems of all kinds are under pressure worldwide” (UNPD 2001a:20). About 34% of all fish species and 58% of coral reefs are now at risk from human activities (UNPD 2001a:20). Flowering plants and vertebrate animals have become extinct in recent years at rates estimated to be 50 to 100 times the expected background rate (UNPD 2001a:20). Destruction of forests, which contributes both to global warming and loss of biodiversity, has been accelerating during the last 30 years, especially in developing countries, where they are being lost to logging, mining, expansion of agriculture, and vegetation removal, including gathering of firewood (UNPD 2001a:20-21, 33). Between 1980 and 1995, developing countries lost about 200 million hectares of forests. Deforestation has been most rapid in Africa (losing about 10.5% of its forests between 1980-1995), especially Sub-Saharan Africa (UNPD 2001a:20-21). Tropical rainforests are a

particularly significant loss, because they contain anywhere from half to 90% of all terrestrial species (UNPD 2001a:21). The report cites a 1992 World Bank estimate that about 60% of tropical forest clearing was due to agricultural development, (UNPD 2001a:33) and also notes that tropical diseases can grow to epidemic proportions as a result of agricultural clearing of frontier areas (UNPD 2001a:35). Agricultural irrigation, which accounts for more than 70% of fresh water from lakes, rivers, and aquifers, is placing “mounting stress” on water supplies in many parts of the world because of “the need to feed a growing population”(UNPD 2001a:33,71). In its conclusion, the report concedes that “whether mediated by technology or by markets and social institutions, there is no doubt that population growth...affects the environment resource base”(UNPD 2001a:78). Without a comprehensive and dynamic model of population, environment and development, “we are thrown back on common sense....”(UNPD 2001a:78).

The debate between neoliberal economists and neo-Malthusians is especially sharp with respect to prospects for food security. Optimistic economists such as Amartya Sen argue that “there is, in fact, no significant crisis in world food production at this time [2000]....there is little room for any great pessimism that food output will soon start falling behind population growth” (Sen 2000:206-9). However, the economic models of agricultural production underlying this optimism assume factor substitutions and market mechanisms can overcome ecological limits. Ecologists, in contrast, take into account biophysical constraints and the long-term sustainability of land intensification. As (agricultural ecologists) David Pimentel and Mario Giampietro put it,

“Some agronomists and many economists generally see no problem in feeding 10 billion people on our planet...whereas ecologists argue that the current population level is already too numerous given...environmental resources. Regarding these

different outlooks...economists and ecologists are simply saying different things. What is considered technologically feasible by agronomists and economists, that is maintaining or improving current yields per hectare in the coming few decades by relying more on technology, fossil energy, soil degradation, and depletion of underground water reservoirs, is not sustainable in ecological terms ....What ecologists do say is that these, so-called, technological fixes are not sustainable in the long run because they are (i) not ecologically compatible with the earth's resources; and (ii) are based on the depletion of fossil energy stocks, which are finite”(Pimentel and Giampietro 1994:14-15).

In 2002, the Food and Agriculture Organization of the UN (FAO) issued a major study projecting world food production prospects through 2030 (FAO 2002). Although the report generally supports the optimistic view of many economists, it also exposes some significant environmental costs of expanded food production. The FAO asserts that although growth rates of agricultural production and crop yields have slowed in recent years, this has been a response to slower demand, and not a sign of land or water shortages (FAO 2002).<sup>18</sup> The FAO is confident global food shortages are unlikely in the future (at least until 2030), if national and international policies promote efficiency, and that the world population will be increasingly well-fed, although in developing countries about 440 million people will be chronically undernourished, 183 million in Sub-Saharan Africa, by 2030 (FAO 2002, 2002a). In fact, the study notes the number of undernourished people in some regions may *rise* because of rapid population growth (FAO 2002).

Food production growth will come from higher productivity. In developing countries, the

FAO believes about 70% of increased crop production will come from higher yields ( from irrigation and fertilizer), 10% from shorter fallow periods and multiple cropping, and 20% from expansion of arable land (FAO 2002, 2002a). Developing countries will require 14% more water for irrigation by 2030(FAO 2002a). However, by that date, about 20 developing countries will suffer actual or impending water *scarcity* (2002b). Developing countries will need an additional 120 million hectares (ha) for crops, but most of the “suitable” new land is in Sub-Saharan Africa (60 million ha) and Latin America(40 million ha)(2002a). Most of this new land will come from forest clearance, and would represent a loss of about 10% of the Sub-Saharan African forest and about 4% of the Latin American forest (since 2000) (UNPD 2001a:21, table.II.7). The FAO acknowledges the “challenges” of meeting production needs while safeguarding the environmental services and biodiversity provided by trees (FAO 2002). It also acknowledges that nitrogen fertilizers are “a major source of water and air pollution,” and that the projected “60% increase in emissions of ammonia and methane from the livestock sector” will require “comprehensive measures”(FAO 2002).

A RAND report (RAND 2000) on population and environment which discussed FAO land-use projections noted, “Converting land to agricultural use can lead to soil erosion, and the chemicals often used in fertilizers can also degrade soil. Deforestation is also associated with soil erosion and can lessen the ability of soil to hold water, thereby increasing the frequency and severity of floods. Human-induced changes in land can often result in habitat fragmentation and loss, the primary cause of species decline. In fact, if current rates of forest clearing continue, *one-quarter of all species on Earth could be lost within the next 50 years*” (RAND 2000).

The FAO says “new technology” is needed to deal with shortages of land or water, as

well as problems with soil or climate, expected to become increasingly serious after 2030, (FAO 2002)<sup>19</sup> and is generally hopeful that biotechnology will increase yields without harming the environment. “Needed for the twenty-first century is a second, doubly green revolution in agricultural technology”(FAO 2002).

The FAO also acknowledges that environmental factors are expected to limit the supply of fish, because by 2000 “three-quarters of ocean fish stocks were overfished, depleted or exploited up to their maximum sustainable yield”(FAO 2002). However, they expect aquaculture to continue to grow rapidly (FAO 2002). Aquaculture is also being promoted by the Malaysia-based WorldFish Center and the International Food Policy Research Institute, which issued a report on declining fish yields in preparation for a conference (“Fish for All Summit”) in November, 2002 (World Fish Center 2002).<sup>20</sup> Ecologists, however, have questioned the sustainability of aquaculture (Rees 2002:29-31). Although bland accounts of declining fish yields might suggest a limited period of conservation can restore “fish stocks,” a major study directed by Dr. Daniel Pauly of the University of British Columbia Fisheries Center (the Sea Around Us project), concluded that the North Atlantic ocean is heading towards a “fisheries collapse”- in effect, losing its ability to sustain further catches. Over the past 50 years catches of cod, tuna, haddock, flake and flounder have fallen by more than half (Pauly 2002). The research reports are available at <http://www.saup.fisheries.ubc.ca/publications/reports>.

David Pimentel and other ecologists have vigorously contested the optimistic economists’ models of agricultural productivity, which they say ignore 1) the non-substitutability of natural resources such as arable land, soil, biota, and water, 2) environmental degradation caused by land intensification and 3) the unsustainability of food production relying

on fossil energy (Pimentel and Giampietro 1994).

The average cropland available for food production worldwide is 0.25 ha per person (Pimentel 2002:419), but 0.5 ha per capita has been suggested as the minimum requirement for a diverse, healthy, nutritious diet of plant and animal products (Pimentel and Giampietro 1994:2; Pimentel *et al* 1994:351-2; Pimentel *et al* 1999:22). Between 1950 and 1992, about one-third of the world's cropland (1.5 billion ha), was abandoned because of soil erosion and degradation, a result of population growth and excessive pressure on the environment (Pimentel and Giampietro 1994:2; Pimentel *et al* 1997:10). It takes 500 years to form 25mm of soil under agricultural conditions (Pimentel *et al* 1997:10). The U.S. is losing cropland soil at an average rate 13 times the sustainability rate of soil (Pimentel, 2000:420). India is losing soil at 30 to 40 times its sustainability (Pimentel 2000:421). In a major report on the environment released in 2002, the UN Environmental Program concluded, "Land degradation continues to worsen, particularly in developing countries where the poor are forced onto marginal lands with fragile ecosystems and in areas where land is increasingly exploited to meet food and agricultural needs without adequate economic and political support to adopt appropriate agricultural practices" (UNEP2002:299).

Most of the degraded agricultural land has been replaced by removing forests. Agriculture accounts for 60% to 80% of deforestation (Pimentel *et al* 1997:10). A CIA assessment of long-term demographic trends (which was based on an October 2000 conference of experts from academia, business, and the intelligence community), noted that "Tropical forests are vanishing at the rate of 250 acres per minute"(CIA 2001:77). Further, nearly half of the world's original forest cover has been lost in the last 50 years, and each year about 16

million hectares of virgin forest are “cut, bulldozed, or burned”(CIA 2001:77). Since about 60% of the world’s population growth this decade will occur in countries with tropical forests, the report expects this population pressure to produce “accelerating destruction of forests”(CIA 2001:76). A combination of demand for wood for cooking and heating, a need for more crop land, and demand for wood in developed countries ensure that “forests will continue to be destroyed at an alarming rate”(CIA 2001:77).

Deforestation is a major threat to biodiversity. It is worth repeating the RAND 2000 projection that current rates of forest clearing would destroy *one-quarter of all species on Earth* within the next 50 years.” Tropical rainforests are a particularly significant loss, because they contain anywhere from half to 90% of all terrestrial species (UNPD2001a:21). Species are also being lost because of pollution, pesticide use, urbanization, and other human activities: “Environmental pressure from the human population is the prime destructive force on earth and is the primary cause of reduced biodiversity” (Pimentel *et al* 1999:30).

Rates of species extinction, which appear to be accelerating, (UNEP 2002:298) have been described by leading scientists as “appalling”(WS 1997). On one estimate, one species extinction occurs every 20 minutes (Levin and Levin 2002:6). The background (“normal”) rate of species extinction, estimated from fossil records, is thought to be about 1 bird or mammal species lost every 500-1000 years (UNEP 2002:121). “Estimates of present extinction rates range from 100 to 1,000 times normal, with most estimates at 1,000. The percent of bird (12), mammal (18), fish (5) and flowering plant (8) species threatened with extinction is consistent with that estimate. And the rates are certain to rise—and to do so exponentially—as natural habitats continue to dwindle” (Lovejoy 2002:70). The extinction rate for some organisms may be 1,000 to 10,000-

times faster than background rates (Pimentel *et al* 1999:30). Ecologists estimate that half of all living bird and mammal species will be gone within 200 or 300 years (Levin and Levin 2002:6). These exceptional losses qualify the present as an era of “mass extinction” (Levin and Levin 2002:6). As “vast tracts of wilderness” vanish in the “not-so-distant future,” the

“alteration and fragmentation of existing habitats ensures that any future radiation of mammals, for instance, will not include large forms such as rhinoceroses, apes and big cats....Human activities will likely increase [primate] rates of extinction....Such a wholesale shift in earth’s biota will impoverish the planet for many millions of years to come” (Levin and Levin 2002:7-8).

Biodiversity loss may pose the greatest direct threat to human survival, if it destabilizes the biosphere and interferes with recycling of such vital elements as carbon, nitrogen, and phosphorus (Pimentel and Giampietro 1994:2). The end result of the accelerating extinction of plant and animal species could be “wholesale ecosystem collapse”(Brown 2000:8). Biodiversity is also essential to a productive and sustainable agriculture, and humans have no technology to substitute for most of the services provided by diverse species (wild biota) (Pimentel *et al* 1994:355; Pimentel *et al* 1997:13). Thus, there are ecological limits on the possibility of converting natural habitats into agricultural fields, and some experts have suggested protecting environmental quality by preserving about one-third of the terrestrial ecosystem as natural vegetation (Pimentel and Giampietro 1994:2; Pimentel *et al* 1994:355).

Economists have proposed agricultural intensification, primarily through more irrigation and fertilization, to increase crop yields. However, there are ecological limits on both methods.

Surface water and groundwater, refilled by rainfall, each provide half of freshwater supply in the world. Groundwater resources are renewed very slowly, usually at about 1% per year (Pimentel *et al* 1994:354). “Even though the *total* amount of water made available by the hydrologic cycle is enough to provide the current population with adequate fresh water—most of this total water is concentrated in specific regions....Water demand [in 1993] already far exceeds supplies in nearly 80 nations....”(Pimentel *et al* 1999:24). About 40% of people in the world live in regions that compete for fresh water supplies (Pimentel and Giampietro 1994:2). In the US, groundwater is being depleted at an unsustainable 25% above replacement level...(Pimentel *et al* 1994:354; Pimentel *et al* 1999:25). The 2001 CIA report estimates that by 2025, 48 countries containing 3 billion people, will face freshwater shortages, and 20 countries of the Near East and North Africa have the worst prospects. “In those areas, water supplies could run out by 2100 if per capita consumption and excessive use in agriculture are not controlled....”(CIA 2001:77).

Currently, about 87% of the world’s fresh water is consumed or used up by agriculture and, thus, is not recoverable (Pimentel *et al* 1994:353-4; Pimentel *et al* 1997:10). Water supplies are also threatened by pollution from pesticides, fertilizers and sediments, toxic chemicals and sewage (Pimentel *et al* 1994:354-5). Ocean water desalinization is not a viable source of fresh water because the process is energy intensive and economically impractical (Pimentel *et al* 1999:25). “Some technologists, like Julian Simon (1996), believe that human population growth will not cause any shortage of water and other resources because we have the technologies to provide for the needs of an unlimited population. It would indeed be a wonderful achievement to see these technologists produce crops without water!”(Pimentel *et al* 1999:32). The 2001 CIA report concludes:“water availability is likely to become one of the most pressing and contentious

resource issues of this century....This situation will only be exacerbated by population growth” (CIA 2001:77).

In developed countries, intensive farming techniques require massive amounts of fossil energy for fertilizers, pesticides, irrigation, and machinery. In developing countries, fossil energy is used primarily for fertilizers and irrigation (Pimentel *et al* 1997:11). In 1991, the US Dept. of Energy projected at (then) current pumping rates the US would exhaust its oil reserves in 15-20 years (Pimentel and Giampietro 1994:3; Pimentel *et al* 1997:11). The world oil supply has been projected to last about 50 years at (1994) current pumping rates (Pimentel *et al* 1999:7). Oil production is expected by some experts to peak about 2004,<sup>21</sup> unless new reserves are discovered (Pimentel *et al* 1999:27). This means prices will rise, with serious implications for developing countries which rely heavily on fossil energy for fertilizer and irrigation (Pimentel *et al* 1997:12).

Fertilizer is used to compensate for eroded topsoil. However, field tests have found that beyond a certain limit, the use of nitrogen fertilizer stresses crop plants and causes yields to decline. Thus, “crop yields can not continue to increase in response to the increased applications of more fertilizers and pesticides”(Pimentel 2000:421). Further, increasing reliance on fossil energy inputs.... increases stress on the environment and is unsustainable (Pimentel and Giampietro1994:11).Heavy use of pesticides and nitrogen fertilizer is a significant source of water pollution, soil erosion, and loss of biodiversity (Pimentel and Giampietro 1994:12). The 2001 CIA report warns, “with continued population growth, the amount of biologically available (“fixed”) nitrogen...may double over the next 25 years, increasing the current excess. Over the past 50 years, excessive nitrogen, principally from fertilizers (some 86%), human sewage, and

the burning of fossil fuels began to overwhelm the global nitrogen cycle, with a range of ill effects from reduced soil fertility to eutrophication in lakes, rivers, and coastal estuaries....”(CIA 2001:79).

In sharp contrast to the FAO’s optimism about “feeding the world,” the CIA report concludes that although overall food production will be adequate to feed the world at least through 2015, “population growth in developing countries will increase stress on soils from erosion and poor fertilization and irrigation practices. Lower classes are farming barren tracts to survive, which increases environmental damage, leading to a vicious downward cycle of productivity and opportunity”(CIA 2001:79). In fact, the developing world, which a few decades ago was a net agricultural exporter, is now a net agricultural importer, and the FAO expects the agricultural trade deficit of developing countries to increase “drastically” by 2030 (FAO 2002b). By 2030, developing countries could be producing only 86% of their own cereal needs, forcing them to rely on food imports from the U.S., EU, Canada, Australia, and Argentina (FAO 2002a). The FAO states the obvious: “The poorest countries tend to be the least able to pay for imports” (FAO 2002a).

Sub-Saharan Africa has the worst prognosis for environmental degradation, food shortages, disease and political instability and violence. Rapid population growth<sup>22</sup> will be a significant factor contributing to “undernourishment” in the region (FAO 2002). Even assuming an increase in agricultural output (by clearing forests and increasing use of irrigation and fertilizer), as well as greater equality in access to food, the absolute number of undernourished people is expected to rise in such extremely poor, high fertility countries as Angola, Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Mozambique, and Somalia (FAO 2002). The

CIA report is blunt: “poor infrastructure and distribution, political instability, and chronic poverty will lead to malnourishment in parts of Sub-Saharan Africa”(CIA 2001:79).

In 2000, Sub-Saharan Africa accounted for almost half of infectious disease deaths globally (CIA 2000). Sixty-five percent of all deaths in the region are caused by infectious diseases (CIA 2000). The CIA believes the most plausible scenario over the next 20 years is “deterioration, then limited improvement”, i.e. a worsening of the infectious disease threat, especially AIDS/HIV, for about 10 years, followed by a “fitful” decrease. However, because of high fertility and a large cohort of young people in developing countries, the CIA expects persistent infectious diseases which will have a disruptive effect on global economic, social, and political dynamics (CIA 2000).

The CIA 2001 report on demographic trends projected three possible futures for the world in 50 years: Fertility Drives the Trends, Orderly Progress, and What Can Go Wrong Will Go Wrong. The last, most pessimistic, scenario will strike many as the most likely. It projects very “rough” times ahead, especially in the next 10-15 years, with increased democratization but a relatively shrinking middle class producing instability in the world and even a breakdown of order in some places (such as Pakistan or Lagos, Nigeria) where the U.S. might not be able to intervene. In 30 years, world income inequality may increase, producing “large pools of angry people”, especially young men, who may turn to violence and terrorism (CIA 2001:97). However, in all scenarios, the report imagines that the U.S. and other rich nations will remain relatively secure and affluent (“globalization has been successful” CIA 2001:97), protected by their military and economic power. The CIA does not seem concerned that environmental damage in developing countries could directly affect the ecosystems of developed countries, or

trigger the “wholesale ecosystem collapse” which many scientists consider a genuine threat.

It is instructive to compare the CIA’s scenario with the most recent UN Environmental Program projections of possible future (2032) outcomes of demographic trends and environmental “challenges”. The four UN scenarios are 1) Markets First (corporate-dominated global capitalist expansion), 2) Policy First (governments agree to meet specific environmental and social targets), 3) Security First ( a world divided between rich and poor, with escalating conflicts caused by environmental and social-economic stresses), and 4) Sustainability First (reinvigorated NGO’s promote global grass roots democracy, as affluent groups, especially in North America and Europe, rejecting the values of consumerism, competition, and individualism, turn away from a free-market approach to development and, with the aid of “breakthroughs” in biotechnology and nanotechnology, take actions to preserve the environment and create an “equitable” global distribution of wealth) (UNEP 2002:Ch.4). Three things are striking about these scenarios. First, the Security First and Markets First models seem to reflect the assumptions made in the CIA report, suggesting the “policy” and “sustainability” options were not being seriously considered by the academic, corporate and intelligence experts who advise that organization. Second, the notion that environmental sustainability could depend on a sudden and widespread shift from “individualistic” to altruistic values (UNEP 2002:332) is a sufficient reason to despair of the possibility of saving the ecosystem. It seems prudent to consider further options. And third, although in every scenario the UN report cites “continued population growth” as a significant, negative environmental factor (e.g. UNEP 2002: 333, 337, 338, 358, 361), the only “solution” given is a nonspecific reference to “policy actions and behavioral changes” which (somehow) “speed up the transition to slower [population] growth”

in the Policy and Sustainability scenarios

(UNEP 2002:323). However, “all of the scenarios assume continued growth in global population, tailing off ... as more countries pass through the demographic transition” (UNEP 2002:323).

*None* of the scenarios suggest specific, effective measures to *reduce* population. It seems population programs have become so “politically incorrect” since Cairo that they cannot even be part of a speculative exercise!

The “sustainability” and “policy” scenarios for Africa assume stronger economic growth in that region (stimulated by a more “equitable sharing” of wealth), will create a demand for higher living standards which, coupled with high fertility, will actually produce *more* land degradation than a free market approach (UNEP 2002:358). Sustainability First has the second worst outcome for forests (after Security First), but “very little natural forest remains in Northern Africa in any of the scenarios” (UNEP 2002:358-9). “Pressures on biodiversity increase between 2002 and 2032 in all scenarios” (UNEP 2002:359). Under the Markets First and Security First Scenarios, nothing mitigates a Malthusian disaster in Africa. In short, it would seem that rapid population reduction offers the best, perhaps only hope of preventing further environmental destruction in the developing world. If that is not achieved, then altruistic re-distribution of wealth (or, at least massive food and medical aid) is likely to offer the best hope of improving the welfare of millions of people in poor countries.<sup>23</sup>

Although the CIA demographic report suggests the U.S. and other rich countries can fend off the effects of global environmental problems, there are studies warning that developed countries, including the U.S., will also face a Malthusian trap within several decades if populations are not reduced. The argument is that as global population increases and

environmental constraints on arable land, water, and other resources erode world food surpluses, the U.S. will be one of only a few countries with enough arable land to have the possibility of achieving self-sufficiency in food production (Pimentel and Giampietro 1994: 1,14; Pimentel *et al* 1994:349-50).

If one assumes there will be no further losses of arable land and/or crop yields in the U.S. because of land degradation, fresh water or oil shortages, or increases in oil prices, Pimentel and other agricultural ecologists estimate the maximum population size that could be fed a reasonably diverse and nutritious diet of plant and animal products is 350 million. However, an optimal population size for the U.S., which not only met nutritional needs but also permitted an *ecologically sustainable* form of agriculture, is about 210 million (Pimentel and Giampietro 1994: 26,28). U.S. population, (294 million in 2003), is expected to reach between about 355 million (low), 409 million (medium), and 470 million (high) by 2050, at which point it is projected to continue growing at an annual rate of 0.41% (medium fertility variant) (UNPD 2003). If Pimentel's calculations are accurate, the U.S. has already lost the capacity to be self-sufficient in ecologically sustainable food production.

Pimentel and other ecologists have also calculated an optimal carrying capacity for the Earth, which would allow everyone on the planet to enjoy a European living standard without causing environmental harm: approximately 2 billion people (Pimentel *et al* 1994:363; Pimentel *et al* 1999:32).

“A world population of 2 billion, in addition to having adequate food, renewable energy, and forest products, should also have adequate freshwater resources....A reduction in the world population to approximately 2 billion, in addition to a

reduced per capita consumption rate, would help reduce the current severe pressure on surface and groundwater resources and pollution, especially in countries where water shortages will only intensify with population growth” (Pimentel *et al* 1999:32).

However, if world population grows to 10 or 12 billion people, that will create a “dire situation,” with “catastrophic” health and environmental problems (Pimentel *et al* 1994:363; Pimentel *et al* 1999:33).

In sum, population *reduction* appears to be necessary first, to stave off a Malthusian catastrophe already unfolding in poor countries; second, to prevent a similar scenario in developed countries; third, to prevent a serious risk of wholesale environmental collapse which would threaten the survival of humanity; and fourth, to allow the possibility of roughly equal, desirable, and ecologically sustainable living standards throughout the world. The evidence of a large and accelerating ecological deficit does not suggest that simply reducing consumption will be sufficient to provide a desirable and environmentally sustainable life for everyone at current, much less projected, population levels.

However, though there is a growing awareness of the need for political action to radically change the global system of (over) production and consumption, there is, at least outside the scientific community, a widespread antipathy toward the notion of government interference in (supposedly) private reproductive decisions.

“Unfortunately, most individuals and government leaders appear unaware, unwilling, or unable to deal with the growing imbalances between human population numbers and the energy and environmental resources that support all

life... We must avoid letting human numbers continue to increase to the limit of the Earth's natural resources and forcing natural forces to control our numbers by disease, malnutrition, and violent conflicts over resources"(Pimentel *et al* 1999:34).

Despite such warnings, population programs have been strongly opposed by many religious conservatives and by those leftists, liberals and feminists who see them as a violation of fundamental "reproductive rights."

## 2. Reproductive Liberty as a Fundamental Right

The 1994 Cairo conference proclaimed a human rights foundation for "reproductive rights", recognizing:

"the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children and to have the information and means to do so, and the right to attain the highest standard of sexual and reproductive health. It also includes the right of all to make decisions concerning reproduction free of discrimination, coercion and violence as expressed in human rights documents. In the exercise of this right, they should take into account the needs of their living and future children and their responsibilities towards the community. The promotion of the responsible exercise of these rights for all people should be the fundamental basis for government- and community-supported policies and programmes in the area of reproductive health,

including family planning”(UNICPD1994:para.7.3).

However, the conference bowed to conservative religious opposition, especially from the Vatican, by endorsing the position that abortion should never be used as a family-planning method (Weigel 1995).<sup>24</sup> The ICPD statement on abortion was incorporated into the European Union’s 1997 statement of policy for aid to population programs in developing countries (Council Resolution 1484/97), which asserts that abortion should never be used as a family-planning method ( Schiele 1999:163).

In 1998, so-called “Christian” morality triumphed in the U.S. when Congress withdrew all funding for the U.N. Population Fund, the main source of international family planning aid (UNFPA 1998). This act reinstated the Reagan policy, announced at the 1984 UN International Conference on Population in Mexico City, barring aid to any groups that considered abortion an acceptable element of family planning programs (Dixon-Mueller 1993:72-76). The Mexico City policy was reaffirmed by President Bush shortly after he assumed office in 2001. In July 2002, the Bush administration withheld \$34 million in previously approved aid to the Population Fund, and at a December 2002 regional family planning conference in Bangkok , the U.S. threatened to withdraw its support for the Cairo declaration because it endorsed the concept of “reproductive rights” and support for “reproductive health services.” The Bush administration said the phrases could be construed as promoting abortion. The U.S. delegation also demanded deletion of a reference to “consistent condom use” to fight AIDS and sexual diseases (Dao 2002, 2002a; Kristof 2003).<sup>25</sup> Critics attribute these policy shifts to domestic politics: winning Catholic and fundamentalist Christian votes (Kristof 2003; Dao 2002a).

Conservative Christian opposition to restricting procreation rests on the theory of natural

law. Although the idea of natural law can be traced back to ancient Stoic philosophy, its modern influence derives from the theology of Thomas Aquinas. In the thirteenth century, Aquinas asserted that (the Christian) God was the author of natural law, which is therefore morally binding on human beings. Aquinas believed the natural law had been expressed by God through revelation, but he also argued it could be discovered by reason. Reason must examine human nature, said to be universal and unchanging, to discover what is objectively good for us, i.e. what “befits” human nature. If we discover a “natural inclination,” we can assume that the author of our nature intends (and has commanded) us to act on that inclination. Thus, since we have a natural inclination to preserve our life, we are morally obligated to do so, and suicide is a violation of natural law. And, since we have a natural inclination to engage in sexual intercourse, which naturally results in offspring, we are morally restricted to “natural”, i.e. procreative, sexual activities.

Natural law morality has been preserved in its present dogmatic form under the guidance of the Vatican, which supports the view that the (heterosexual) family, as a “natural institution” serving the divinely sanctioned purpose of procreation, has rights which must be respected by the state. Birth control or abortion are unnatural, hence immoral, acts of interference with the reproductive function.<sup>26</sup> Abortion also violates a natural “right to life” attributed to a fetus. Based on these assumptions, the Vatican has been waging a vigorous global campaign to resist both voluntary contraception or abortion and state population measures. The Church has addressed “demographic [i.e. overpopulation] problems” as moral issues which are to be resolved (somehow) through “the rights of man: respect, justice, peace, solidarity, love.”<sup>27</sup>

Among many liberals, the Cairo conference created a consensus that population policies

must be based on the “cornerstone” of human rights, that is, a right to reproductive self-determination (Abrams 1996:1). Population programs, which “treated women instrumentally, as tools through which to implement population programs”, are to be replaced by a health and rights approach which sees women as “intrinsically valuable” (Shalev 2000:39-40). The claim is that respect for reproductive liberty requires governments and international agencies to provide a full range of reproductive health services (including infertility treatment), and work to “empower women” rather than attempting to reach demographic targets (Freedman 1995: 334-337; Rahman and Pine 1995:407; Abrams 1996:1,32).

A “human rights” approach to reproduction would not permit a state to “compromise” reproductive rights in any way by, for example, resorting to any form of coercion (Tuermen 2000:32). ‘Coercion’ has been defined to include incentives or disincentives that compromise “voluntary choice” (e.g. offering or denying money or significant social benefits to a poor woman), the imposition of “psychological pressure” including group pressure and “heavy propaganda” as well as forced sterilization, abortion, or contraceptive use ( Boland *et al* 1994:100; Fathalla 1995:1183; Abrams 1996:7-8; Broomfield 1996). However, some liberals have argued that, “because population policy assumes state regulation, direct or indirect, of reproduction, the very concept of a population program may be inconsistent with reproductive self-determination” (Abrams 1996:22-23), and that a violation of human rights is “inherent” in narrow efforts at fertility control (Boland *et al* 1994:99,100). Thus, “In terms of state population policy, the recognition of reproductive self-determination means that population programs must become [voluntary] family planning programs” (Abrams 1996:31-32).

Some feminists have (objectively) lent support to religious conservatives by attacking

family planning programs. These feminists claim that *all* population policies, including subsidies for children and access to contraception and family planning, interfere with women's reproductive rights and ignore the "true causes" of poverty and environmental degradation: militarism and consumerism (Schiele 1999:164) <sup>28</sup> Indeed, some feminists have "demonized" population programs, <sup>29</sup> accusing "the population establishment" of, at worst, promoting race- and class-based eugenics, and, at best, following an agenda which ignores their concern with empowering women (Petchesky 1990:Ch.1, 2, 3:116-125; Dixon-Mueller 1993:77-78;Ch.2). <sup>30</sup> The "population movement" has been faulted for focusing on lower population growth, rather than ensuring the right of women to control their bodies and lives: "... the 'freedom' of the individual to decide was, in the view of the population movement, readily limited by the 'responsibility' to make the fertility-limiting decision imposed by government population policies purportedly in furtherance of the public good [i.e. to control world population growth]" (Freedman 1995:336).

The assertion of reproductive self-determination as a fundamental right has been based on four key UN documents: the UN Charter (1945), the UN Universal Declaration of Human Rights (UDHR, 1948), The International Covenant of Civil and Political Rights (1966), and the International Covenant on Economic, Social and Cultural Rights (1966). These agreements constitute what has been called an International Bill of Rights, laying out a "modern" conception of human rights (Boland *et al* 1994:90; Dixon-Mueller 1993:Ch.1; Mann 1998; Hannum 1998 ). The UN human rights doctrine has two distinct moral foundations. The first is the classic (17<sup>th</sup> and 18<sup>th</sup> century) liberal theory of "natural" or "inalienable" individual rights which is embodied in the English Bill of Rights (1689), the American Bill of Rights (1789), and the Declaration of

the Rights of Man and of the Citizen passed by the French National Assembly in 1789 (Dixon-Mueller 1993:5; Tuermen 2000:33). The focus of classical liberal theory is protecting individual liberty, especially against government tyranny. The second foundation for “human rights” is a concept of “social entitlement, that is, the responsibility of society and the state to guarantee not only freedom of *opportunity*... but also achievement of results” (Dixon-Mueller 1993:6). The second concept, which has been attributed to 19<sup>th</sup> and 20<sup>th</sup> century socialist thought, (Dixon-Mueller 1993:6) proposes a set of economic and social rights such as education (Article 26, UDHR), and the right to work, with just and favorable conditions of work and with just remuneration sufficient to ensure an existence “worthy of human dignity” (Article 23). The fact that, for example, the United States has ratified the Political but not the Economic covenant underscores ongoing tension between liberal conceptions of individual political and civil rights and socialist ideals of economic and social entitlements.<sup>31</sup>

Although reproductive liberty is not specifically listed as an individual right in the UDHR, a variety of UN declarations, resolutions, covenants and conventions have been taken to justify the claim that reproduction within the family is a fundamental human right. Article 16 of the UDHR asserts that men and women have the right to marry and to found a family, and that the family is the “natural and fundamental group unit of society”, entitled to protection by society and the State. However, Article 29 states that everyone has duties to the community, and that rights and freedoms are subject to limitations to protect the rights and freedoms of others and to ensure “the general welfare.” Thus, the possibility of legitimate coercive limits on founding a family is not inconceivable although, in practice, the UN has chosen to rule this out.<sup>32</sup>

The 1968 UN International Conference on Human Rights (Teheran) passed resolution 18:

“Parents have a basic human right to determine freely and responsibly the number and spacing of their children and a right to adequate education and information in this respect.” The word ‘responsibly’ was inserted because of concerns about rapid population growth, (Boland *et al* 1994:91,n.1; Shalev 2000:60, n.4) suggesting a latent conflict about the precise boundaries of reproductive “freedom.”<sup>33</sup>

The UN specifically addressed women’s reproductive rights within the family in 1981, when the General Assembly adopted the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW, or Women’s Convention). Article 16.1.e requires State Parties to “ensure, on a basis of equality of men and women:...the same rights to decide freely and responsibly on the number and spacing of their children...” The focus on the human rights of women, especially rights to personal reproductive autonomy and gender equality, was turned into a “primary principle in the development of reproductive health and population programs” at the 1994 ICPD (Cairo conference) (Shalev 2000:40).<sup>34</sup> Cairo represented a paradigm shift in development efforts, away from a focus on population control, toward a model of “empowering women” and support for a full range of reproductive health services.<sup>35</sup>

Both leftists and feminists have emphasized the entitlement aspect of “reproductive liberty”, arguing that an abstract (classical liberal) right to choose “means little when women are powerless” (Petchesky 1990:11). The critical issue is “the social and material conditions under which choices are made”(Petchesky 1990:11). Thus, the state has an affirmative responsibility to create “equality of conditions for reproductive choice,” including a full range of social supports for bearing and raising children, equal pay and status for women in the work force, an end to racism, elimination of reproductively hazardous environments, and a cultural revolution which

will transform gender roles and re-define the meaning of sex (Petchesky 1990:395-7;Petchesky 2000).

Feminists underline a third element in the concept of reproductive liberty, namely, women's "right" and need for bodily self-determination. Since it is in women's bodies that pregnancies occur, it follows that even in the most utopian, egalitarian society, women should retain the exclusive right to control their own bodies. That is, women have a "preemptive claim" to reproductive autonomy with respect to abortion and childbearing (Petchesky 1990:13, 400).

Rosalind Petchesky, a Marxist-feminist who is widely cited in the "rights" debate, has asserted categorically that "reproductive freedom means the freedom to have as well as not to have children"(Petchesky 1990:16). Pronatalist and antinatalist policies are unacceptable in a race- and class-divided society (Petchesky 1990:16, 392). Petchesky argues that since there is no "natural right" to procreate, collective social regulation of reproduction could be legitimate, but *only* given a context of "revolutionary social relations of reproduction" (i.e. an egalitarian utopia), and even then the "right" of women to control their bodies would rule out coercive sterilization, abortion, or surgical, chemical or other bodily interventions for contraceptive purposes (Petchesky 1990:400). The point is amplified by Correa and Petchesky (1994:108,114): "We are suggesting not that reproductive...rights are absolute or that women have the right to reproduce under any circumstances....[but we do not subscribe to] "the claim that women have a duty to society (or the planet!) to abstain from reproducing. Such a duty could begin to exist only when all women are provided sufficient resources for their well-being, viable work alternatives, and a cultural climate of affirmation outside of childbearing so that they no longer depend on children for survival and dignity....And even then, antinatalist policies that

depend on coercion...would be unacceptable.” In the meantime, Petchesky defends the rhetoric of indefeasible “reproductive rights” as a useful “discursive strategy” (“hortatory” rather than descriptive or analytic), to create a narrative which empowers marginalized groups (women, blacks, gays and lesbians) in the political arena (Petchesky 1990:395). It seems some Marxists have decided to pin their hopes for “revolution” on moral rhetoric rather than on “the dialectic.”

Although the socialist and feminist defense of reproductive liberty appears to defend it as an *absolute*, or indefeasible right, (or, as a right which should be treated as absolute under present conditions of unequal social power), the claims for “human dignity” and for a woman’s right to control her body do not rationally justify an unconditional right to reproduce.

The socialist concept of entitlement is perhaps the most controversial of the claims about rights. On the face of it, socialism calls for coercive re-distribution of wealth in violation of liberal property rights. Liberals generally defend such rights as necessary to ensure individual liberty, to prevent government tyranny, and as a necessary condition for efficient markets and thus welfare-enhancing economic growth. This debate leads well beyond the bounds of this paper. However, even if one accepted the entitlement view, it does not follow that reproductive liberty should be absolute. “Human dignity” is not an entitlement for species cleansing of the planet. Presumably socialists have no desire to destroy the Earth’s ecosystem. At the very least, that would have dire consequences for human welfare. Thus, if there is a grave threat to the environment requiring a significant reduction in human load, including reductions in population, coercive limits on reproduction would be entirely rational. Petchesky’s notion that a “duty” to save the planet would only come into play *after* the world has been transformed into a utopia is so absurd one must assume the environmental threat has not been fully assimilated.

The right of a women to control her body is obviously central to a debate about coercive pronatalism. Feminists have emphasized that fertility regulation (contraception and abortion), and the right to refuse to marry or to procreate are essential conditions for the autonomy of women (Dixon-Mueller 1993:115-6). Coercive pronatalism represents such a serious assault on individual liberty, privacy, and bodily integrity that it could only be justified by the strongest evidence of a conflict of rights (in the abortion debate, justification for the claim that a fetus should be viewed as a 'person' endowed with a "right to life"), or of some unimaginably grave and, at this point, quite implausible social harm. However, there is an important asymmetry between a right not to procreate and a right to do so: the right to control one's body by *refusing* to reproduce does not pose a threat to the environment or to the welfare, even the survival, of humanity. If the only way to avoid environmental catastrophe were to impose coercive limits on procreation (by men and women), even, if necessary, using methods which violated bodily integrity, a decision to do so would be entirely rational.

Widespread liberal opposition to population programs is surprising, given the weight of the evidence of a looming environmental catastrophe. On the face of it, a liberal justification for reproductive liberty would treat it as an exercise of individual liberty which would, in principle, be subject to a limit if it came into conflict with other rights or, from a utilitarian perspective, if it caused significant social harm. The environmental argument summarized in section one is, at the very least, a strong *prima facie* case for placing coercive limits on a decision to beget and bear children. However, many liberals have simply dismissed environmental problems (as well as issues of economic development) as "cynical" and "weak"(Boland *et al* 1994:96-97). Some liberals have argued that if "reproductive rights" are universal moral principles, they should not

be “qualified” by the language of “responsibility to the community” with respect to population objectives (Abrams 1996: 36-7,39-40). Liberal opposition to population programs raises a basic question about the rational foundation for asserting a fundamental and inalienable right of reproductive liberty.

Modern political liberalism has been heavily influenced by the social contract theory of government proposed by John Locke in the seventeenth century. Locke’s assertion of natural and unalienable rights has become a kind of bedrock assumption for many secular liberals, even though the theory ultimately rests on a foundation of natural law which Locke assumed but did not demonstrate. If the “cornerstone” of human reproductive rights is founded on natural law, it may be possible to claim that these rights are inalienable. However, if the natural law view of the family is stripped away from the “rational contract,” such rights, if they exist, should be limited by other rights.

In the *Second Treatise of Government*, Locke justifies human rights by an appeal to natural law, which is the moral law established by God and revealed to humanity both through scripture and through reason, as self-evident truths. The “fundamental law of nature” is that “man [is a life form]... to be preserved as much as possible,” (16). That is, we are morally obligated to carry out God’s will that human life, as God’s property, be preserved as much as possible. And, since we have a duty to preserve life, we have a natural right to life. From the obligation to preserve life it follows that we have a natural right to the property which is needed for this purpose, both property in the narrow sense of money, lands and goods, and in the broader sense of “lives, liberties and estates”(123). In effect, Locke treats natural rights as something we “own”: ourselves, the property we acquire by the right of our labor,<sup>36</sup> and the liberty we need to

do what is morally permissible to preserve our lives (legitimately “confined” by laws of society only for the purpose of improving the preservation of life, liberty and property) (129,131).

Locke accepted the natural law view of marriage. Its basic purpose,( in addition to mutual support), is procreation and the continuation of the species, a duty to God which requires that the marriage bond last at least until the offspring are “able to shift and provide for themselves”(78).

As a natural institution, “the civil magistrate doth not abridge the right or power of either naturally necessary to those ends, *viz.* procreation and mutual support and assistance while they [man and wife] are together....”(83).

Locke did not consider the possibility that overpopulation might create a conflict between the natural purpose of the family (hence, liberty to procreate) and the preservation of human life.

If one emphasizes the natural purpose of the family and a duty to God to propagate the species, one might conclude that interfering with procreation, even in order to improve the preservation of life, would be immoral. On this account, there would be no right to limit reproduction within marriage either coercively or through voluntary contraception or abortion. However, modern secular liberals who defend “reproductive liberty” as a fundamental human right have tended to ignore the theological, natural law foundation for, and (with respect to contraception and abortion), limits on, that claim.

If one takes out the natural law component of Locke’s theory, one is left with the following claim: preservation of “life, liberty, and property” are fundamental rights in the sense that rational agents agree to a social contract for the purpose of protecting those rights, and so

would only agree to governmental restrictions if these were necessary to preserve and improve them, i.e. if there were a conflict of rights. Apart from the natural law view of the family, there does not appear to be a basis for carving out reproductive liberty as a specific “fundamental right,” rather than simply treating it as one aspect of a general right to liberty. On this (secular) account, individuals would have a right to choose contraception and (leaving aside the question of any “right to life” attributed to a fetus), a right to abortion; and the state could not legitimately limit procreative liberty unless there were a conflict of rights.

If there is now good evidence for a serious conflict between procreative liberty and a right to life, (preserving human life against an environmental catastrophe, leaving aside a further utilitarian goal of preserving and maximizing a desirable *quality* of life), a restriction on reproductive liberty, within a secular “rational contract,” would be legitimate. There is no reason for a secular humanist to accept the risk of an ecological catastrophe to preserve an unrestricted right to reproduce. Indeed, it is not unreasonable to believe that the rhetoric of “fundamental human rights” attached to reproduction has become harmful. On the face of it, human welfare would be best served by abandoning the vestiges of a natural law view of the procreative rights of the family, and regulating reproduction to achieve and maintain an ecologically sustainable population level.

To the extent that Locke’s theory of rights rests on natural law, it is probably not the most cogent basis for justifying a rational social contract which can protect rights and also deal effectively with the tragedy of the commons. One alternative to a Lockean model might be to justify restrictions on reproductive liberty along Hobbesian lines. Hobbes’ theory, in sharp contrast to Locke’s, was widely disliked by his contemporaries because he rejected natural law

teleology and because his “scientific” model of human nature is distinctly unflattering. On Hobbes’ account, a “state of nature” is a state of war in which we seek power over one another to satisfy our desires. Since humans have approximately equal power, such a life is intolerable – “solitary, poore, nasty, brutish, and short” (*Leviathan*, Ch.13). Hobbes concluded that a rational agent, acting only on self-interest, would agree to an exchange of “natural liberty” for security within a sovereign state, by creating a social contract establishing a sovereign ruler with sufficient power to protect life and property. Since he saw the natural condition as one of radical individualism, in which there was no class cohesion to offset the war “of every man against every man,” Hobbes argued for an absolute, self-perpetuating sovereign. However, a neo-Hobbesian could justify an elected sovereign if there were a sufficient number of citizens with common interests, (above all, an interest in preventing tyranny), who could reach a consensus about the terms of a social contract: the political rights to be protected and the obligations to be met by the sovereign (Macpherson 1962: ch.2). The key point in this version of social contract theory is that some limits on “natural liberty”(or, egoistic, uncooperative choices) are justified by rational self-interest.

The development of decision theory provides a useful model of Hobbesian reasoning. In the game known as “the prisoner’s dilemma”(Kuhn 2001), two individuals, isolated from one another, must choose whether to “cooperate” or “defect” given a set of outcomes in which cooperation would bring the best result for both *only* if both cooperated, but the worst result to each if the other did not cooperate. Under those conditions, rational self-interest will produce a suboptimal outcome for both. Obviously, the welfare of each would be improved if they were able to make an enforceable agreement to cooperate. In Hobbesian terms, the absence of a “sovereign” power to enforce a cooperative agreement leaves

them with “natural liberty”, but at the price of a sub-optimal welfare outcome.

The “tragedy of the commons” described by Hardin illustrates the same dilemma with respect to the use of “free” but scarce common resources. If one grants the premise that overpopulation is destructive to the environment, (and ultimately to humanity), then cooperative agreements to restrict reproduction are rational measures needed to protect basic individual and social interests.

This approach obviously runs counter to the pervasive feminist view that coercive antinatalism poses the same threat to women’s autonomy as coercive pronatalism. For example, advocates for women in patriarchal countries with very strong pronatalist cultures often cite poverty and lack of legal protection, pensions, and economic opportunities as a reason women *must* produce children, especially sons, in the hope that at least one will provide support in old age. Feminists then argue that antinatalist population programs would be harmful to these women (Dixon-Mueller 1993:134-5). To take one example, a researcher in Kenya reported the following: “Mothers have large numbers of children in the hopes that enough will survive disease, poverty, and desperate overcrowding to live to support their parents in old age by scavenging in dump heaps or begging for food.”(Hardaway 1997:1234). This is an entirely rational, self-interested decision given a *laissez-faire* approach to reproduction. It is also clearly sub-optimal. It seems clear that everyone would benefit if reproduction were regulated, since the demand for scarce resources would decrease. Even more obviously, individual and system-wide welfare would increase if there were a cash incentive -- ideally, entitlement to a pension -- to, effectively, “buy out” reproduction privileges. However, in coercively pronatalist cultures, even coercive population reduction measures could actually support women’s autonomy, by allowing

many women to do what they would *prefer* to do.<sup>37</sup> The suffering of people, especially women, in countries with high fertility will almost certainly continue to escalate to a horrifying level if fertility and population are not quickly reduced.

A neo-Hobbesian approach to reproductive liberty would ask whether, under present conditions, a rational, self-interested agent should give up natural (unlimited) reproductive liberty in exchange for a limited social “right” (or, a license) to reproduce, up to some limit compatible with the preservation of life at an acceptable consumption level? If the evidence suggests people are, or will be, far worse off with unrestricted population growth, the conclusion is obvious.

### 3. A Global Agreement for the Commons

Probably the most common argument made by liberals who acknowledge “demographic problems” is the claim that a crisis is not yet imminent, and therefore the overpopulation threat can be effectively addressed through economic development and especially through better educational and economic opportunities for women, rather than by resorting to methods which violate “human rights”.

For those who believe there *is* an imminent crisis, the question is whether the voluntary decisions of rational and “empowered” individuals can be relied upon to resolve the problem in time, or whether governments should establish population programs, even coercive ones, to achieve ecological sustainability.

Confidence in economic development as a solution to demographic problems was originally based on the so-called demographic transition model, which has been influential since the 1940s.

This theory explains reductions in fertility rates as a function of economic development, prosperity, education, and reduced infant mortality. However, this model has failed to explain recent declines in fertility rates in developing countries, forcing demographers to search for more complex theories.<sup>38</sup>

There is evidence that improvements in women's status significantly enhance the transition to lower fertility rates. Women who have access to birth control, and are able to make decisions about reproduction, are likely to have fewer children (Sen 2000; Brown *et al* 1999:131). So, it might appear that a left/liberal defense of "reproductive liberty" and a feminist perspective on the need to "empower" women through access to education and paid employment coincide with the most efficient means to resolve the population problem. This is exactly the position which has been argued by such influential political economists as Amartya Sen (Sen 2000; Dreze and Sen 1995; Sen 1996).<sup>39</sup>

Sen has acknowledged a need to slow down population growth (for environmental reasons), or "the world certainly would be tremendously overcrowded before the end of the twenty-first century"(Sen 2000:210). But he rejects coercive methods as incompatible with human rights and as unnecessary, because empowering women is the most efficient way to achieve demographic transition. Sen has repeatedly cited a comparison between fertility reductions in the Indian state of Kerala and in China as evidence for the efficiency claim. Kerala reduced its fertility rate from 3.0 in 1979 to 1.8 in 1991 with no coercive policies, while China, which introduced the one-child policy in 1979, only reduced its rate in that period from 2.8 to 2.0. Sen argues that the key variables which explain fertility reduction in Kerala are high levels of basic education, especially for women, along with access to health care and an important role for women in the economic and political life of Kerala (Sen 2000: ch.8,9; Sen 1996:1056; Dreze and Sen 1995:77-83). If this example can be

generalized, it follows that coercive population programs are unnecessary. In effect, women's reproductive rights are the best contraceptive.

The first counter-point to Sen is that, although women *are* likely to have smaller families if given the choice, the strength of anti-feminist forces in some parts of the world almost certainly rules out rapid improvements in female status. Sen's discussion of Kerala fails to point out that the "empowerment" of women in Kerala did *not* occur within a short time period. What the Kerala example shows is, not what was done in 12 years, but rather the depth of the social revolution which took place over 200 years through an "activist democracy": the organized power and sacrifice of the poor, aided by some remarkable allies from the upper castes. Kerala is in many ways a region with a uniquely progressive culture and politics, and should certainly not be taken as a model for a realistic near-term global solution to the environmental crisis posed by overpopulation.

The conditions which made Kerala's rapid decline in fertility possible include some remarkable and beneficial elements in the culture and history of the region. Among other factors, the matrilineal Nair caste (about 16% of the population) had a long tradition of female control over sexuality and property which empowered these women long before modern reforms (Douglas 1970:171-2; Franke and Chasin 1989: 90-94; McKibben 1995: 142-3). A successful grassroots social revolution which began with a rebellion against the caste system starting in the early nineteenth century radicalized the population and laid the foundation for a broad coalition between the lower castes and the trade union and Communist movement which emerged in the 1930's (Franke and Chasin 1989:75-81; McKibben 1995:ch.3). Kerala has benefitted from redistributive policies carried out since 1957, when the first democratically elected Marxist government in the world assumed office. Starting with a radical land reform passed in 1969, a series of governments have

implemented progressive policies, including state pensions for agricultural workers, subsidies for health care, food and other essential items, and a highly effective campaign to achieve “total literacy”(Ramachandran,1995; Kumar 1979; Franke and Chasin 1995; McKibben 1995).<sup>40</sup>

The government decided to make population an issue in the 1960s, appealing to the state’s “rationalist” tradition to make the case that smaller families were a condition for creating a well-educated, prosperous society. Contraceptives were widely distributed, IUD’s inserted for free at local clinics, and women activists spear-headed a grass roots campaign to promote a small family norm (McKibben 1995; Marquand 1999; Banerjee *et al* 2002). Today, both men and women in Kerala are given a small cash incentive if they choose sterilization, and most women elect sterilization after the second or third child (Marquand 1999). One Kerala birth rate expert attributes the success of the program to the radical social changes which preceded it: “In Kerala, the determinants came in the right order – a reduction in infant and child mortality, followed by or along with an increase in female education, followed by redistributive policies, and finally the official family-planning programme”(Franke and Chasin 1989:44).

The precondition for these social changes was, again, 200 years of social revolution. Kerala emancipated itself from an especially rigid caste system, religious hatred, gender discrimination, and illiteracy, and the people of the region have made government accountable, demanding massive redistribution and an array of social welfare benefits which are now being tested by the pressures of the global economy (Ramanathaiyer and Macpherson 2000; Parayil 2000; Franke and Chasin 1995; Ramachandran 1995; McKibben 1995:145,162).

In the world outside Kerala, it is unlikely that empowering women is the most efficient *general* solution to overpopulation. The point is *not* that empowering women has no effect on

fertility, but rather that, contrary to Sen, the time frame for reducing population is probably too short for the cultural evolution, perhaps revolution, needed to accomplish this in some parts of the world. A 1994 UN population and development review found that improvement in women's status since the 1980 Women's Convention (CEDAW) was "much slower than expected" and in fact had deteriorated in many developing countries, and attributed pervasive and continuing gender discrimination to the traditions and practices controlling social relationships.<sup>41</sup> Patriarchal gender norms are often rationalized by religious beliefs and traditions which support high fertility as well as subjugation of women, especially in agrarian societies. "The wife's subordination to the husband may be expressed by worship of him and his lineal ancestors" (Davis 1998:148). At a 2001 UN conference discussing high fertility countries, a Nigerian demographer noted that according to traditional African beliefs, "ancestors are reincarnated through additional births" so that preventing a birth means "consigning an ancestor to oblivion,"(Makinwa-Adebusoye 2001: (12)5,6). Further, the general form of African households,( mostly rural, patriarchal and hierarchical, frequently polygynous, and highly motivated to perpetuate a male lineage), "perpetuate women's subordinate position and make them rather voiceless and powerless in matters affecting their reproduction....In fact, the bottom line is that women and their children are legal property of the husband" (Makinwa-Adebusoye 2001:(12)6,7).<sup>42</sup>

A second response to Sen is that the shift from a focus on population to women's empowerment and reproductive health services may actually be one of several factors which will slow the pace of fertility decline in developing countries. One of the prominent themes highlighted in the UN Population Division's 2002 expert group meetings was noticeably reduced support for population programs since Cairo. Jason Finkle questioned the "problematic" result of the Cairo

paradigm shift from macro social concerns to individual welfare, suggesting that the exclusive focus on “empowerment of women” had a negative result:

“Lost in the shuffle and acclaim for the Cairo agenda was the concern over population size and growth, issues which demographers and other population specialists still considered to be of great importance.....We do know that donor nations have not met the financial targets set at Cairo; developing countries have not embraced Cairo thoroughly; more rhetorical obeisance than programmatic support has been given to Cairo. What we may be seeing is that development, societal concerns and a macro focus have greater support among aid-givers and the governments of developing countries than does a policy that focuses on the individual’s welfare concerns and a micro approach” (Finkle 2002:83, 84).

John Caldwell believes the Cairo action program “discouraged many involved in existing family planning programs by seeming to condemn what they had hitherto regarded as past successes and by appearing to ask more than their countries’ health services could provide in the foreseeable future. It has almost certainly also confused donors who had not previously considered that the much more expensive national education and health services warranted the same proportional support as did the family planning programs”(Caldwell 2002: 74). Steven Sindling noted that : “assistance for population programs has fallen well short of the goals set at [Cairo]....the absence of a sense of urgency about high fertility at senior policy levels, either in donor capitals or in most developing countries, suggests to me that the ‘population movement’ as it has existed since the 1960s, may be close to having run its course”(Sindling 2002:88-89). Reduced funding for population programs is cause for concern, not only because fertility decline has not begun in many countries and is slowing

in others, but because “we are in the era of the largest cohort of reproductive aged people in history” and even if all of these people only wanted two children, “the consequences of even small differences in unwanted fertility will...be very large” (Sindling 2002:89).

Diminished international support for population programs, including funding for the distribution of subsidized modern contraceptives, cannot be blamed entirely on the Cairo agenda. Conservative religious opposition to contraception and abortion, coupled with a belief that the remedy for poverty is market reform and free trade rather than family planning, account for significantly reduced funding from the U.S. (In 2003, the U.S. donates only 300 million condoms annually, down from about 800 million in 1992 (Kristof 2003).) Further, unexpectedly rapid fertility declines in many developing countries, along with below-replacement level fertility in many developed countries, has created the impression in some quarters that population is “no longer a problem,” and indeed, that in rich countries, the “problem” may even be low fertility (UNPD 2002:20). In any case, the strange alliance of religious conservatives, feminists, “progressive” liberals, and free market ideologists now poses a threat to the environment and human welfare. John Caldwell points out that the loss of interest in population growth, reflected in changing “attitudes, policies and expenditures,” may have a “significant demographic impact”, perhaps making the difference between an eventually stable population of 8 billion or one of 12 billion. “The differences in long-term environmental sustainability could be huge” (Caldwell 2002:72, 78).

In the case of Sub-Saharan Africa, a study of proximate (direct) determinants of fertility concluded that a transition to low fertility will require a significant increase in the use of modern contraceptives, and that the “full reproductive health agenda” poses “problems” for the region by undermining a focus on much needed core family planning services (Guengant and May 2001: (3)

14,17,18). The 2002 UN Population Division's report on demographic transition in intermediate-fertility countries notes that most below-replacement fertility societies have very high levels (65-85%) of use of effective contraceptives, implying that a large increase in contraception will be necessary for fertility reduction in the developing world (UNPD 2002a:53,55). John Bongaarts finds some empirical support for human development (especially health and education) as (intermediate) determinants of fertility transition (citing the examples of Sri Lanka and Kerala), but also stresses that replacement-level fertility cannot be achieved without "a high level of birth control.....Ready access to family planning methods and abortion services is needed to achieve low levels of unwanted childbearing" (Bongaarts 2002a:295). A study of Nigeria which cast doubt on the odds of reaching replacement level by 2050 noted: "In almost all the countries that have experienced significant reductions in fertility levels...government has demonstrated strong support for fertility control programs. Unfortunately, the same cannot be said of Nigeria now"(Feyisetan and Bankole 2002:515).

Given the fact that about 80% of all contraceptive users receive their supplies from public sector programs, and that it is estimated about 100 million women in all nations (excluding China) have an unmet need for contraception (Rahman and Pine 1995:403),<sup>43</sup> even as a billion young people between 15 and 24 enter their reproductive years, reduced support for family planning programs is certain to have a major impact on fertility. Thus, the efficiency of the Cairo paradigm as a replacement for population programs is a matter of critical concern.

Fertility reduction has been achieved under a wide, even "bewildering" range of social conditions: when economic conditions have been improving or deteriorating, in societies with both high and low living standards, and in countries with both increasing and decreasing gender inequity

(UNPD 2002:10; UNPD2002a:49). However, it is clear that, whatever the underlying causes may be, strong government support for efficient population programs has produced striking results in many developing countries. Bangladesh, for example, is often cited for the effectiveness of its family planning program (Amin and Hossain 1995). Government population programs in Iran and Egypt have been supported by religious leaders who reassured people that the Koran does not forbid contraception (UNPD 2002: 17-18, 26-7). Since 1989, Iran has imposed a National Birth Control policy to reduce population and increase contraceptive use (Obermayer 1994: 66).<sup>44</sup> Contraceptive pills and free condoms are widely available, men and women are required to attend classes about contraception before obtaining a marriage license, and, in 1993, the government dropped certain maternity benefits for couples with more than 3 children (Muir 2002). Population and family planning is also a compulsory unit for university students. As a result of these measures, contraceptive use was estimated to be about 72% in 2000, and the TFR has fallen from about 6 during the 1980s to 2.26 by the end of the 1990s (UNPD 2002: 26-27). The Iranian government has designated 2000-2010 “the decade of population crisis” (because of an expected “echo” of the post-revolutionary baby boom), and the slogan “Two is enough” is, literally, everywhere, even on children’s toy and chocolate boxes (UNPD 2002:17-8,27-7). Islam, (unlike Roman Catholicism) is a pragmatic religion(UNPD 2002:18).

Under the white (apartheid) government of South African, fertility declined at an unprecedented rate in the Sub-Saharan region, from a TFR of about 6.6 for black Africans in 1960 to 3.1 in 1998. Although the well-funded National Family Planning Programme launched in 1974 was explicitly motivated by demographic and racist fears, and did nothing to improve black African economic welfare or empower women, it was nonetheless embraced by many African women for

their own reasons, probably without the knowledge of their spouses ( Swartz 2002). This finding suggests that in patriarchal societies creating incentives for men to reduce fertility would be effective.

Women deserve exactly the same rights as men. However, neither men nor women have an absolute “right” to procreate. If one believes that reducing fertility as rapidly as possible is essential, and if narrowly-focused population programs are in some cases the most efficient means to that goal, it follows that *substituting* a women’s rights agenda for effective population measures is, from an environmental perspective, misguided and harmful.

A final objection to the “empowerment” solution to high fertility is that, if the carrying capacity estimates made by Rees, Wackernagel, Pimentel, and others are correct, reducing human load to a sustainable level will require absolute *reductions* in population, and not merely a transition to replacement level at somewhere between 8 and 12 billion. Even with below-replacement fertility, population reduction would be a slow process. For example, David Pimentel estimates that it would take more than 100 years to achieve an “optimal” global population of 2 billion, even if each couple could be limited to an average 1.5 children (Pimentel *et al.* 1999:31). And, since human load is a function of both consumption (and technology) and population size, countries with high consumption levels have the largest ecological deficits, despite generally low birth rates. From this perspective, the U.S., despite the empowerment of women, has been described as the most “overpopulated” country in the world (Ehrlich and Ehrlich 1997:1191,1203). Yet, it is fair to say that there is currently no broad support in the U.S. for the view that U.S. fertility rates are too high.<sup>45</sup>

And while the UN’s Environmental Program projects a “sustainability” scenario which requires a sudden turn away from materialism in affluent nations (UNEP 2002), there is no sign of this so far,

and it is very unlikely that rich countries will ever agree to significant redistribution of wealth based on altruism. Global bickering about what is “fair” is likely to produce stalemate. The CIA demographic scenario (CIA 2001) suggests some level of confidence in government and corporate circles (at least before 9/11/2001), that environmental damage (and its social consequences) can be managed, and that the U.S. and other affluent allies will continue to enjoy material prosperity without reducing population size.

Although altruism is unlikely to save the environment, there might be some hope based on enlightened self-interest. If, as many predict, environmental problems begin to accelerate, with corresponding damage to human interests, it should become obvious that everyone is harmed by damage to the ecosystem. The U.S. and other rich countries do not have the option of living in “gated communities” on planet Earth. Indeed, we face a bleak future in a Hobbesian state of nature unless each nation agrees to terms which will resolve the tragedy of the global commons. On the face of it, the best, perhaps only, way out of the dilemma is an agreement requiring each nation to eliminate its ecological deficit,<sup>46</sup> making its own trade-off between consumption and population size. No country would be permitted to “live beyond its means” by emigration or by exporting pollution. It is likely that, faced with a choice between population reduction or dramatic reductions in consumption, (or other constraints), most people would choose the former. Each nation could choose its method of achieving sustainability. Perhaps in some countries education, the example set by enlightened leaders, and fear of environmental collapse would be sufficient to reach population targets. However, it seems unlikely populations could be reduced rapidly without some coercive measures.<sup>47</sup>

Is there likely to be a rational resolution of the commons tragedy? It may be that success in dealing with unsustainable reproduction and consumption will actually decide, far more

“objectively” than any cultural test, the nature of our species. A species which risks destroying the preconditions for its own survival (while wishing to survive) is hardly rational.

## Notes

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1. “Ecological footprint: the ...area of productive land and aquatic ecosystems required to produce the resources used, and to assimilate the wastes produced, by a defined population at a specified material standard of living, wherever on Earth that land may be located” (Rees 1996: *Box 3*). See also Wackernagel and Rees, 1996.
  2. Humanists generally believe only direct costs to humans “count” in a moral sense, but in the end, nature has the potential to inflict a catastrophic punishment for the *hubris* in our species’ disregard for the survival of other species in a healthy ecosystem.
  3. “Ecological deficit: the level of resource consumption and waste discharge by a defined economy or population in excess of locally/regionally sustainable natural production and assimilative capacity (also, in spatial terms, the difference between that economy/population’s ecological footprint and the geographical area it actually occupies” (Rees 1996: *Box 3*).
  4. See Dicken, 1998 for a recent, detailed study of the state of the global economy. Dicken shows how transnational corporations have shaped a complex network of financial and production chains through which regional and national economies become “locked in” to a particular pattern of development.

5. For example, “The WTO, the World Bank, and the IMF, while intoning the term ‘sustainable development’ at every opportunity, continue to support the goal of infinite growth for the world, including especially the high consumption societies....Global trickle down remains their solution to poverty” (Daly 2001). Daly was the senior economist in the Environment Department of the World Bank from 1988-94. He is now a professor at the University of Maryland.

6. For example, policies to strengthen territory-based community systems over kinship-based systems, suggested by McNicoll, 1998 and Cain & McNicoll, 1998.

7. The UN population estimates give a range of projections (low, medium, and high), based primarily on their assumptions about fertility and mortality.

8. The report noted, “no specific probability is attached to the [UN’s low-medium-high] range, and what it means is therefore unclear.” To address this problem, the panel analyzed the distribution of errors in past UN forecasts over two decades (NRC 2000:10).

9. UN population projections are revised every two years, following meetings with experts.

10. Intermediate fertility is a TFR above replacement level (usually 2.1 children per woman), but below 5; low fertility is fertility at or below replacement level; and high fertility is a TFR of 5 or more.

11. Momentum is a function of the current young age structure of the world’s population. In 2000,

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the world total median age was 26.5 years, 18.2 years in the least developed countries (UNPD 2001: table 7). The National Research Council study concluded that over half of the projected population growth to 2050 would be due to population momentum (NRC 2000: 27-28).

12. See note 38 for a discussion of demographic transition theory.

13. See Rees, 2002 for a discussion of Julian Simon and neoliberal optimism.

14. The IMF report cites a study by UC Berkeley professor Bradford DeLong,

“Estimating World GDP, One Million B.C.-Present”, available at <http://econ161.berkeley.edu>.

The DeLong study finds that economic growth accelerated sharply after 1950, and that from 1950 to 2000 total world GDP per capita grew about 4 times faster than world population. Total world GDP per capita (in constant dollars) grew from about 4082 billion dollars to about 41,017 billion, and population grew from about 2.52 billion to 6.057 billion between 1950 and 2000.

15. The IMF report notes helpfully that intellectual property rights and free markets increase the potential for technical breakthroughs (IMF 2000:153).

16. An “overshoot” is possible for a limited period by depleting essential ecosystems and using up non-renewable resource stocks (Rees, 2002:40).

17. Malthus argued that human population expands geometrically, (i.e. exponentially), while the means of subsistence can at best increase arithmetically. Since that imbalance is unsustainable, it must be corrected, either by a “positive check” (famine, disease, war) or, theoretically, by a “preventive check” – sexual abstinence. (Malthus considered contraception to be immoral.) Malthus was quite pessimistic about the prospect of widespread voluntary sexual abstinence, and so he

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predicted a positive check would almost certainly be needed to correct imbalances. Neo-Malthusians (who support contraception as a moral practice, acknowledge that prosperity *may* reduce fertility rates, and concede the positive check is not *inevitable*), have argued that Malthus' basic point is indisputable, namely, "there is a limit on the capacity of the earth to support an expanding population" (Hardaway. 1997:1216).

18. Worldwatch has attributed slower growth rates in grain harvests to lack of new land and slower growth in irrigation and fertilizer use (Brown *et al* 1999:33-36). The FAO says demand has slowed for two reasons: 1) diminishing increases in demand by affluent consumers with high levels of food consumption, and 2) declining rates of world population growth. The FAO report cites the UN Revised 2000 medium estimate of an additional 2 billion people by 2030, rather than the *equally probable* high estimate of another 2.7 billion and says nothing about the 2050 projection of another 3 to 4.7 billion by 2050 (medium and high estimates) (FAO 2002a). The FAO also claims "perceptions of a continuing population explosion are false", (FAO 2002) even though the actual numbers are likely to rise by 2050 by at least as much as between 1950 and 2000.

19. The FAO says "The main and increasingly serious impacts of climate change on agriculture will occur after 2030" (FAO 2002b).

20. The report said that population growth and overfishing would cause one billion people in developing countries to face fish shortages within 20 years, and that "strong growth in fish farms" would be needed to meet the need for protein. Professor Robert Kearney, who presented the Conclusions from a Panel on the Environment, noted that "The sustainability of aquaculture is still quite contentious." The report, conference agenda, and press release is available at

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[www.fishforall.org/outcomes](http://www.fishforall.org/outcomes)

21. See Holdren (2002:65-6) for a discussion of the debate about this date, and the point that rising oil prices will force a shift to alternative energy before all oil stocks are depleted.

22. African population, about 851 million people in 2003, is expected to increase to between 1.5 billion (low), 1.8 billion (medium), or 2.1 billion (high) by 2050. This estimate takes AIDS into account (UNPD2003:Table 1)

23. Although “it might be possible to feed the current 6 billion people a minimal but nutritionally adequate diet, if all food produced in the world was shared and distributed equally....there are problems with this proposal....how many people in developed and developing countries ...would be willing to share their food and pay for its production and distribution? Also, if the world population doubles to 12 billion, then this option would no longer be possible because of severe shortages of land, water, energy, and biological resources....”(Pimentel *et al* 1999:31). The “sharing” option also assumes current, unsustainable, levels of agricultural productivity.

24. Before the Cairo conference, the Vatican formed a political alliance with fundamentalist Islamic clerics and representatives of Muslim countries such as Iran who opposed the UN’s concept of women’s rights and women’s autonomy (Mayer1995:127ff.). However, Islamic governments are not necessarily opposed to population policies, as, for example, the programs of Iran, Egypt, Bangladesh, and Indonesia demonstrate. *See* Afkhamil 1995 for an excellent discussion of the concept of women’s rights under patriarchal and non-patriarchal interpretations of Islam.

25. The Bush administration may allow some of the \$15 billion proposed to fight AIDS in Africa

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and the Caribbean to be given to organizations that promote or perform abortions “under some circumstances” which remain to be specified. Colin Powell said the administration will try to remain consistent with the Mexico City policy. Some health and family planning organizations have said they may be forced to choose between taking the AIDS money and providing a full range of health services (Stevenson 2003).

26. The (1992) Catechism of the Catholic Church teaches that contraception is a mortal sin.

"By its very nature the institution of married love is ordered to the procreation and education of offspring" (#1652). And: "Every action which, whether in anticipation of the conjugal act, or in its accomplishment, or in the development of its natural consequences, proposes, whether as an end or as a means, to render procreation impossible is intrinsically evil" (#2370). This doctrine has been re-affirmed in several papal statements: *Casti Connubii* (1930): “any use whatsoever of matrimony exercised in such a way that the act is deliberately frustrated in its natural power to generate life is an offence against the law of God and of nature, and those who indulge in such are branded with the guilt of a grave sin”; *Humanae Vitae* (1968), which declared contraception to be intrinsically evil, and *Evangelium Vitae* (1995).

27. ‘Reflections on Demography and the Ethics of Family Planning’ at [www.simbahayan.org](http://www.simbahayan.org), website of the Roman Catholic Archdiocese of Manila’s Commission on Marriage and Family Life. Simbahayan also sponsors a “Friends of Life” document defending natural law and attacking population programs as revivals of Nazi ideology ( <http://choice4life.tripod.com> ).

28. The [www.simbahayan.org](http://www.simbahayan.org) (Catholic Archdiocese) website recommends a book by Lynette

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Dumble in which she attacks RU486, describing it as “persuasive” because of Dumble’s credentials as a “feminist scientist.” On August 11, 1999, Lynette Dumble and Elizabeth Hartmann (Director of the Hampshire College Population and Development Program) circulated a petition against “population control” which attacked “demographically driven population policies” which “violate women’s rights” and exhibit a patriarchal “logic of domination.” (‘Open Letter to Oppose ‘Day of 6 Billion’) The Women’s Global Network for Reproductive Rights, a feminist group with headquarters in Amsterdam, has actively opposed research on contraceptive vaccines (Moreno and Claro 1994:52). See <http://mai.flora.org> for links to essays by Dumble, Hartmann, and other feminists who argue that claims about overpopulation are “alarmist”, and that population targets “inherently undermine” rights.

29. At a recent UN conference on demographic transition, one of the speakers referred to “the demonization of family planners that pervaded the corridors of the Cairo conference and [which] has become part of the gestalt of many women’s rights groups”(Finkle 2002:84).

30. Ruth Dixon-Mueller is a feminist who does acknowledge the “overwhelming problem of sustained population growth at the global level” (Dixon-Mueller 1993:216). Her view is that a focus on empowering women will liberate women from coercive pronatalist social forces more effectively than traditional population programs (Dixon-Mueller 1993:198, 216-9).

31. The UDHR is not binding in international law, but covenants and conventions are supposed to bind ratifying states to implement the principles. The conflict between the two notions of rights surfaced when a U.N.-sponsored World Food Summit (Nov.13-17, 1996) issued a declaration

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affirming “the right of everyone to have access to safe and nutritious food consistent with the right to adequate food and the fundamental right of everyone to be free from hunger” (*Rome Declaration on World Food Security*. FAO 1996). The U.S. government entered a reservation stating that the right to adequate food was “a goal or aspiration” but not an international obligation on governments (‘Interpretative Statements for the Record by the Government of the United States of America’, FAO 1996:Annex II). The Vatican, in contrast, supported the right to adequate food, but objected to references in the text to population and family planning policies (‘Holy See: Reservations and Statement of Interpretation’, FAO 1996:Annex II).

32. In 1990, the UN addressed the question of family rights, and issued a comment stating: “The right to found a family implies, in principle, the possibility to procreate and live together. When State parties adopt family planning policies, they should...not be discriminatory or compulsory.” (General Comment 19; Article 23 of the International Covenant on Civil and Political Rights, Thirty-ninth session, 1990).

33. Boland *et al* (1994:93) discuss the 1984 UN International Conference on Population (Mexico City) text, explaining the meaning of “responsible” reproduction as taking into consideration “the implications...for the balanced development of their children and of the community and the society in which they live.” The Mexico City text referred to the rights of “all couples and individuals” to decide on the number and spacing of their children “freely and responsibly.” However, by 1984, the U.S. government, a major sponsor of population programs, had decided rapid population growth was no longer a problem, i.e. an obstacle to economic growth. The Reagan administration favored growth through free markets and refused to support any population programs which used coercive

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methods or offered abortion services, counseling or referrals (Dixon-Mueller 1993:72-6).

34. The evolution of the UN's concept of reproductive choice as a "human right" is reflected in the International Planned Parenthood Federation's Charter on Sexual and Reproductive Rights, which identifies 12 such rights, each one derived from specific UN human rights instruments (IPPF 1996).

35. Reproductive health is defined in the ICPD Programme of Action as "a state of complete physical, mental and social well-being...in all matters related to the reproductive system"(7.2).

36. See Macpherson (1962) for analysis of Locke's justification of capitalism as a theory which based property rights on natural law and then removed the natural law limits from that right.

37. Petchesky (2000) discusses an imagined case, based on "real-world facts", of a South African woman, married to a man who contracted AIDS from prostitutes and then infected her, who is afraid to suggest that he use condoms for fear of beatings and accusations of "promiscuity". Her culture tells her to "accommodate her husband's desires." She discovers she is pregnant, but cannot afford the drugs which might save her child from HIV. If the state were to coercively sterilize her husband (or prosecute him for manslaughter), or force her to accept chemical contraception (which she desired but her husband opposed), would these measures *reduce* her "autonomy"? Mahmud and Johnston (1994) cite a "true story" of forced marriage in a South African community where many 14-year-old girls are forced to leave school and marry. In this case, the young girl was continually beaten and forced to have four children, despite a heart attack. "Generally married women are not allowed to make any decisions or say anything which contradicts their husbands. They cannot use

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contraception of any kind because they should ‘give birth until the babies are finished inside the stomach.’ It does not matter whether you give birth ten or fourteen times”(p.155). “Reproductive health services” for women forced to serve as sexual servants and breeding stock by brutal patriachs would not appear to support any “choices” made by such women. Until there is a successful women’s rebellion, many women’s needs (and desires) might be best served by coercive antinatalist interventions. Rather than attacking population programs, feminists should focus on economic and legal issues raised by African women. At a meeting on widows’ rights held prior to the 1995 Beijing Fourth UN World Conference on Women, widows from developing countries gave graphic testimony about their dire condition, abandoned without legal protection and suffering from the collapse of traditional family structures, especially in Africa. See [www.widowsrights.org](http://www.widowsrights.org)

38. The theory was developed to explain a broad fertility decline in Europe following the Industrial Revolution. At stage one, both fertility and mortality rates are high. Then, with modernization, mortality falls, creating a period of rapid population growth. Finally, fertility rates fall and population stabilizes. The report of the expert group of demographers assembled by the UN Population Division in March 2002 concluded that “we are still far from knowing what factors were responsible for triggering and sustaining the marked fertility reductions that have taken place....”(UNPD 2002a:49). A “blended theory” suggests fertility will fall when couples are “ready” (when reduced fertility is advantageous), “willing” (when fertility reduction is considered legitimate), and “able” (when effective contraceptives are accessible) (UNPD 2002a:49-53). The willingness criterion suggests the importance of “elite opinion” in supporting population programs. See Robey *et al* (1993) for a discussion of demographic transition theory

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and John Bongaarts' model of proximate determinants of fertility.

39. John Rawls accepted Sen's assertion that coercive measures to reduce population were unnecessary if a society protected "human rights" and especially "equal justice for women" (Rawls 1999:109-110).

40. Communist or communist-led governments held office from 1957-59, 1967-70, 1980-82, 1987-91, and 1996-2000. Even when the communists were not in power, public pressure forced the centrist coalition which ruled from 1970-80 to carry out a number of leftist policies.

41. *Fourth Review and Appraisal of the World Population Plan of Action*, United Nations Document A/CONF.171/4 (1994), paras. 49-50 (Abrams 1996:18-19).

42. Although the author concludes that sociocultural forms supporting high fertility in Sub-Saharan Africa can give way, that some countries in this region have started a demographic transition, and that the process would be helped by a paradigm shift to "women's empowerment", her data show that only 8 out of 30 Sub-Saharan countries (excluding South Africa) meet her criteria for a transition, with TFR's ranging from 4.3 to 6.2. Only 3 countries had TFR's below 5 (4.3, 4.5, and 4.9). At the same workshop, other demographers were pessimistic about prospects for a smooth demographic transition or near-term improvements in women's status, and recommended a focus on increasing the use of effective modern contraception and other family planning services (including abortion), rather than promoting "the full reproductive health agenda" (Guengant and May 2001:(3)3,7,14,17,18).

43. Robey *et al* (1993:67) cite an estimate that 120 million married women of reproductive age

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have an unmet need for contraception, and that if demand for family planning in developing countries were met, contraceptive use would rise from 51% to over 60%. In one survey, in 14 African countries less than half the need was met— less than one-third in most Sub-Saharan countries.

44. Iran has also promoted women's education and the social and economic role of women, justifying all these policies with reference to Islamic tradition. However, there is no clear evidence of significant improvement in women's status, suggesting that it is still an open question "whether changes in gender roles are the pathway through which political values are translated into reproductive outcomes"(Obermeyer 1994:66-68).

45. Carrying Capacity Network is one of the few organizations in the U.S. to focus on both population and consumption aspects of unsustainability. ([www.carryingcapacity.org](http://www.carryingcapacity.org).)

46. Mario Petrucci argues for a Red-Green alliance, combining a Green critique of industrial growth with a neo-Marxist ideology (rejecting determinism but, presumably, retaining a labor theory of value)( Petrucci 2002: 325-352). He rejects the 'carrying capacity' model and concerns about overpopulation as a form of 'eco-fascism' (329) which stabilizes a capitalist system of global privilege (332,346); and argues that ecological concerns about population reflect a Malthusian viewpoint which now, as in the 19<sup>th</sup> century, justifies the wealth of a global elite (328,330,332,346). This critique of neo-Malthusian concerns flies in the face of the growing scientific consensus about the threat of unsustainable levels of consumption *and* population. Neo-Marxists who take this line appear to be stuck in a 19<sup>th</sup> century debate, unable or unwilling to see that the commons tragedy poses a survival threat to everyone, and is thus an objective

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basis for unified political action to change the global production system. Hobbesian and neo-Malthusian survival concerns are far more likely to spur welfare-enhancing political action than the (by now discredited) call for “class warfare.” Eliminating humanity’s environmental deficit would fundamentally transform global capitalism. And if *national* economies became sustainable, the disparity between rich and poor nations should gradually diminish. Among other factors, southern nations should become more prosperous and economically self-reliant as a result of population reductions, the end of unsustainable global trade, much more favorable terms of trade (with environmental costs factored into commodity prices), and the dispersion of manufacturing which would be needed to reduce human load in developed countries. (Although China is rapidly transforming itself into a global manufacturing center, about four-fifths of all manufacturing is now located in North America, western Europe and Japan – 60% of that in the U.S., Japan, and Germany (Dicken 1998:27).) In a sustainable world, it might be that the difference between a ‘regulated market’ and ‘market socialism’ would become moot, and the utility of private capital would be judged pragmatically. (See Daly and Goodland (1994) for a detailed discussion of the ecological implications of global trade and TNC-dominated growth. Daly (2002) proposes a new “ecological tax” structure.)

47. An agreement could include a burden of proof on governments to justify the need to use coercive methods which violate bodily integrity (e.g. forced sterilization), rather than, e.g. economic penalties, to help ensure coercion would be minimized.

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