SPECIAL FOCUS: YOUTH AND GLOBAL POPULATION
Largest Generation of Youth in History

The momentum of global population growth is indeed slowing. Thanks to the efforts of the past 30 years, growth rates have fallen and will fall further in the coming decades. But because of high fertility in the past, world population is still growing by over 80 million people a year. It will continue to grow at or near these levels for the next decade. What happens after that depends on action in the coming years.

Ninety-seven percent of the world population increase takes place in the less developed regions. Every year the population of Asia is increasing by 50 million, the population of Africa by 17 million and that of Latin America and the Caribbean by nearly 8 million. Africa has the highest growth rate among all major areas. Sixty percent of the world population increase is contributed by only 10 countries, with 21 percent contributed by India and 15 percent by China.

Past high fertility means that more young people than ever -over 1 billion between ages 15 and 24 - are entering their childbearing years. At the same time the number and proportions of people over 65 are increasing at an unprecedented rate. The rapid growth of young and old "new generations" is challenging societies’ ability to provide education and health care for the young, and social medical and financial support for the elderly. This is the news according to the United Nations Population Fund’s, The State of the World Population 1998.

Over the next two decades some less developed regions will see a temporary "bulge" in the working-age population relative to older and younger dependents. This “demographic bonus” offers countries an opportunity to build human capital and spur long-term development — if they invest in education, jobs and health services, including reproductive health care.

East Asia was the first developing region to experience the demographic bonus, and it helped to build the region’s prosperity into the mid-1990s. Asian countries invested their demographic bonus in health care and education. The Republic of Korea, for example, increased net secondary school enrollment from 39 to 84 per cent between 1970 and 1990 while more than tripling expenditure per secondary pupil. South America had a similar opportunity but missed it because countries failed to make similar investments. A similar window of opportunity is opening in Southeast Asia and South Asia.

6 BILLION AND GROWING
World population, 3 billion in 1960 and 5 billion in 1987, will pass 6 billion in 1999. Whether it ultimately grows to 8, 10 or 12 billion will depend on policy decisions in the next decade. Over 90 percent of the growth will take place in today’s developing countries. As the largest-ever young generation comes of age, society’s obligation to address their educational and health
needs, and to promote their human rights is both a moral and practical imperative.

European countries went through a gradual transition from high to low fertility and mortality over the past 150 years. The transition is very much faster in today’s developing countries, where improvements in preventive health and medical care in recent decades have dramatically reduced mortality, especially infant mortality, and increased life expectancy.

Fertility has also declined, but much more slowly, resulting in unprecedented population growth and young populations. Since 1960 Gross Domestic Product per capita has tripled and contraceptive use has grown fivefold, from 10-12 per cent of married couples to 60 per cent in 1995.

In some developing countries, mostly in Africa, fertility and mortality are still high, though declining. There, a woman’s chances of dying as a result of pregnancy are more than 1 in 20. life expectancy is below 60 years and 10 per cent of newborns do not survive their first year.

In the least developed countries, 43 per cent of the people are under age 15. In 71 high-fertility countries, more than 40 per cent are under 15. Since 1980 over half of the global increase in adolescents has been in sub-Saharan Africa.

In all developing countries, the proportion of the population aged 15-24 peaked around 1985 at 21 per cent. Between 1995 and 2050, it will decline from 19 to 14 per cent, but actual numbers will grow from 863 million to 1.16 billion.

Children under 15 in developing countries outnumbered people over 65 by nearly 10 to 1 in 1950—more than double the ratio in the developed countries—and by over 11 to 1 in 1975, the ratio in 1995, though falling, still exceeded 7 to 1.

As a result of reduced fertility and mortality, there will be a gradual demographic shift in all countries over the next few decades towards an older population. The number of people over 65 will grow by about 9 million this year, 14.5 million in 2010 and 21 million in 2050. By 2050, 97 per cent of the growth of older populations will be in today’s developing regions (more than one quarter will be in India), compared to 77 per cent now.

In a growing number of countries, couples are having fewer children than the two they need to “replace” themselves in the population. But even if “replacement fertility” were reached immediately, populations would continue to grow for several decades because of the large numbers of people now entering their reproductive years.

This momentum will account for up to two-thirds of the projected growth of world population, more in countries where fertility declines have been fastest. Raising a mother’s age at first birth from 18 to 23 would reduce population momentum by over 40 per cent.

In countries that have already reached replacement fertility, an influx of migrant workers could ease the labor force decline and alleviate pressures on social security systems.

**ADOLESCENT WOMEN HAVE THEIR OWN UNMET NEEDS**

Today, there are more than one billion young men and women between the ages of 10 and 19 around the world—the largest generation of youth in history. The 260 million 15-to-19-year-old women throughout the world are the next generation of mothers, workers and leaders. To fulfill these roles their sexual experience must be acknowledged and their educational and reproductive health needs must be met.

Parents, communities and governments must recognize how quickly the world is changing, and how imperative it is to direct attention to improving the situation of girls and young women. Indifference, wishful thinking and denial will not prepare their children, particularly their girls, to take their rightful place in a modernizing world.

This is the conclusion of an extensive report compiled by The Alan Guttmacher Institute, a New York City based NGO, on the basis of research conducted in 53 developing and developed countries, covering five major regions which represent about 75% of the world’s total population.

The study found that up to 60% of adolescent births throughout the world are unplanned, and about one in nine adolescents lack the contraceptive protection they need to prevent an unwanted pregnancy. Furthermore, over 300 million cases of curable Sexually Transmitted Disease (STDs) occur worldwide each year, with young women especially susceptible to these diseases.

Girls continue to be disproportionately disadvantaged in their access to education. While more young women today get a basic education than did their mothers, (seven or more years of schooling) girls in many developing countries get less schooling than boys and those in rural areas get less than girls in urban communities. Gender disparity is common throughout North Africa, the Middle East and Sub-Saharan Africa, where half of the

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<table>
<thead>
<tr>
<th>Country</th>
<th>Educated Women Aged 45-49 (percent)</th>
<th>Educated Women Aged 20-24 (percent)</th>
<th>Difference (percentage points)</th>
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<tr>
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<td>Burundi</td>
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<td>8</td>
</tr>
</tbody>
</table>

Distribution of population in the less developed regions by access to health services, 1985-1995.

**SOURCE:** Charting the Progress of Populations, December 1998

countries studied showed six or fewer young women attend secondary school for every 10 young men enrolled.

On the basis of the study of sexual activity and marriage, the majority of women have their first sexual experience as adolescents. Although levels of early union and marriage have typically declined, adolescent marriage remains common among women in some regions. In many countries of Sub-Saharan Africa, 40-60% of adolescent women marry by age 18, and in others, such as in Mali and Niger, more than three-quarters of marriage by age 18 and in Latin America and the Caribbean 25-40% do.

The study found that worldwide, 11% of adolescent women—or 29 million, both married and unmarried are sexually active and do not want to have a child soon, but lack the necessary protection to prevent an unwanted pregnancy, either because they are not using a contraceptive method or because they are using less effective methods. Alarming, in Asia, contraceptive use among married adolescents is very low in India and Pakistan (less than 5%) but more common in Indonesia and Thailand (36% and 43%, respectively), where it has increased strikingly since the 1970s. In Sub-Saharan Africa, North Africa and the Middle East, rates of contraceptive use are low among married young women 20-30% in Morocco, Namibia and Zimbabwe, and under 10% in many others.

The study still shows that each year, adolescents have more than 14 million births worldwide. In the United States, seven in 10 births to adolescents are unplanned. One-fourth to one-half of all adolescent births in Latin America and the Caribbean are unplanned, as are 15-30% of those in North Africa and the Middle East and 40-60% in such Asian and Sub-Saharan countries as the Philippines, Ghana, Kenya, and Zimbabwe.

Across Sub-Saharan Africa, Asia, Latin America and the Caribbean, a woman who has her first child before age 15 will have an average of seven children by the time she has completed her family; That means that if today's young women were to have their first child two-and-one-half years later than is currently the average age at first birth, population growth by the year 2100 will be 10% lower than if no change occurs; if they postpone that first birth by five years, it will be 20% lower—a decrease of 1.2 billion people.

Faced with an unwanted pregnancy, some young women seek clandestine abortions, which endangers their health—or their very life. The rate of adolescent abortion varies from country to country, ranging from very low levels in Germany (3 abortions per 1,000 women aged 15-19) and Japan (6 per 1,000), to moderately high levels in Brazil (32 per 1,000) and the United States (36 per 1,000).

In Malawi, Uganda and Zambia, adolescent women represent one-fourth to one-third of patients suffering from complications of unsafe abortions, that number is more than half in Kenya and Nigeria. In Latin America and the Caribbean, about one-tenth of all women hospitalized after an abortion are younger than 20, and adolescents comprise one-third of the women with the most serious infections.

Furthermore, sexual relationships that result from force, coercion and abuse, and some cultural practices such as female genital mutilation, endanger the reproductive health of young people. Young women who are sexually abused are at risk of infection and unwanted pregnancy, and they may also suffer other trauma and psychological distress. In the United States, four in 10 women who have sex before age 15, report their first sexual experience as involuntary. In Santiago, Chile, nearly 3% of young women who have sex before age 18 say that rape is their first experience of sexual intercourse.

In some regions of the world, the AIDS epidemic has reached shockingly high proportions among adolescents; nearly 13% of all urban youth aged 14-20 in Rwanda are infected with HIV. Half of HIV infections occur among people younger than 25, and recent estimates show that some 7,000 15-24-year-olds are infected with HIV each day. In Botswana, Nigeria and Rwanda, 20% or more of pregnant adolescent women test positive for HIV.

**CONCLUSION**

As we approach the world of 6 billion in less than six months time, growth will not stop. Human numbers will certainly continue to expand to reach 7 billion, but whether our population then goes on to 8, 10 or 12 billion depends on individual actions made in the next decade.

Those decisions will be determined by the one billion young men and women—the largest generation of youth in history — now entering their childbearing years. A truly formidable demographic force and their pattern of childbearing will have major implications for the future size of the world's population.

FOOD FOR THOUGHT:
Eco-tourism in Lancaster County, Pennsylvania

The countryside of Lancaster County, Pennsylvania is a national asset and is of international significance. In June 1996, at Habitat II, the Second U.N. Conference on Human Settlements in Istanbul, Turkey, the former Prime Minister of Turkey asked: Is Pennsylvania known as the Amish state? No, it is the Keystone State, but it is world-renowned for the Amish and Mennonite farms and the beautiful rolling countryside. In fact, Lancaster County has some of the most fertile farmland in the world, a colonial heritage linked closely with the birth of the nation and the distinct culture and way of life of the Old Order communities. The farmland is the keystone of the Lancaster County identity and a primary source of community pride.

Lancaster County has been the stage set for several popular theatrical productions including the movie "Witness" with Harrison Ford; and the play "Plain and Fancy." Lancaster County is also world famous for its Amish and Mennonite quilts, Amish horses and buggies, Amish barns, country roads, and farm foods. These features and strong images of Lancaster County gradually began to give way in the 1970's and 1980's due to a dominant new force known as suburban sprawl. New housing developments began to spring-up in previously cultivated farmland. Small, historic towns and villages were being enveloped by non-descript, look-alike subdivisions. Strip shopping centers and factory outlet stores began to line the major highways. Suddenly, the pastoral look of the country began to change. County officials felt that if the misguided pattern of growth and change were to continue, it would be inevitable that Lancaster County would lose its identity and simply become an indistinguishable component of the eastern seaboard megalopolis.

In 1993, the Lancaster County Planning Commission prepared a Comprehensive Plan, a "Growth Management Plan" for their 627,000 acres (253,846 hectares). The Plan is a bold attempt to conserve the heritage landscape situated a 1-1/2 hour drive west of Philadelphia. The plan is intended to accommodate growth over the next 20 years, while conserving important natural and cultural resources. Many elected officials and civic leaders worked with the County residents and business persons to devise the Plan, focused on saving the remaining countryside. The Comprehensive Plan evolved after extensive public participation and input. The heritage values of Lancaster County were considered to be too important to lose, and too important to be over-
shadowed by the next shopping mall or large lot residential subdivision. Although many localities derive their revenues from tourism and related services, Lancaster County is taking action to balance tourism and development interests, with land conservation interests. In this way, a more effective win-win solution is evolving.

The key ingredient of the Plan is the Urban Growth Boundary (UGB), which encircles the City of Lancaster and 11 other Villages. Places like Strasburg, Lititz, Manheim, and Ephrata are intended to maintain their Village status and expand slightly to accommodate new development. (It is interesting to note that these Germanic place names conjure up the images of their namesakes in Germany. It is not surprising, therefore, that Lancaster County has chosen to follow the German model for Village development and countryside preservation).

Essentially, the UGB concept works like this:

• infill development is allowed within the UGB, where the infrastructure such as public water, public sewer, roads, schools, and municipal services, is already in place;

• land outside the UGB remains in farmland and productive agricultural use, and is maintained as the scenic countryside;

• the local economy benefits through increased tourism, with sightseeing in the farm country, and shopping in the nearby towns and villages.

The Comprehensive Plan is being implemented by the 60 municipalities of the County, and a number of agencies such as the Lancaster County Planning Commission, the Lancaster Farmland Trust, and the Lancaster County Housing and Redevelopment Authorities. Many of these agencies are also collaborating on a "Livable Communities" initiative. The "Livable Communities Work Group" is in the process of designing a "Heritage Neighborhood" in one of the 12 UGB's. This effort is a fine example of the implementation of the regional plan, in order to preserve the ecological integrity of the Lancaster County landscape, and to enable tourism to be a sustainable activity.

Key principles of the Livable Communities Work Group that pertain to the Eco-Tourism and regional planning concepts include:

• to concentrate on infill development within existing villages to achieve a compact mix of uses, versus spreading-out development with individual uses on large lots;

• to conserve farmland and other open spaces in the form of greenways to separate villages and other settlements;

• to adaptively re-use existing buildings, streets, and civic spaces to foster re-building in an existing village, versus sprawling out to convert the countryside;

• to concentrate on creating walkable communities as a means of reducing auto dependency.

These principles are critical to the success of Eco-Tourism in Lancaster County, and to the health of future generations of County residents and visitors. These principles are also critical to maintaining a healthy quality of life.

Through the on-going Eco-Tourism and regional planning efforts, there have been several noteworthy accomplishments of the County (which now leads all other counties in the nation in production from non-irrigated land) including:

• Approximately 260,000 of the 400,000 acres in farm use are protected by effective agricultural zoning (the "flip-side" of the Urban Growth Boundary zoning);

• Over 15,000 acres of farmland have been preserved by permanent easement;

• The trend has changed in the loss of farmland acreage per year. From 1959 to 1992, 3,119 acres of farmland per year were lost to development. From 1994 to 1997, 2,066 acres of farmland were lost each year. The loss per year is now down below 2,000 acres.

The Lancaster County model is truly useful to other Counties that are attempting to protect heritage values and promote Eco-Tourism.

Promoting the development of environmentally sustainable tourism is a priority for UNEP.

HEALTH AND ENVIRONMENT:  
*The “Monster” of North America*

The last issue of the *World Ecology Report*, contained a cartoon showing the result of toxic contamination in Sydney, Nova Scotia. In response to a reader’s comment about this cartoon, we present the background information on the Sydney Tar Ponds for our readers who may be unaware of this egregious environmental health problem.

Beautiful Cape Breton Island, in the northeastern segment of the Canadian province of Nova Scotia, is home to what is regarded as the largest toxic waste site in North America. Known as the “Monster,” the Sydney Tar Ponds contain over 700,000 tons of noxious sediments, of which an estimated 50,000 tons are contaminated with polychlorinated biphenyls (PCBs). The accumulated toxic waste is situated in a tidal estuary, which sends PCBs and other dangerous pollutants into the North Atlantic with every tidal cycle. The residents of Nova Scotia suffer the highest rates of cancer in Canada, and within the province, Cape Breton has the greatest percentages of lung cancer, breast cancer and stomach cancer.

Referring to the toxic waste site as a tar pond is a misnomer. The contaminated area is, in fact, an estuary at the mouth of Muggah’s Creek, into which the by-products of steel-making and coking have been dumped for 90 years. Coking is the process by which a coal derivative, coke, is produced in containers called ovens. Coke has a high heating value and as Cape Breton’s steel industry expanded, coke production grew. An unlined municipal dump, originally used for hazardous wastes from the steel mill, sits at the head of Muggah’s Creek and leaches into it. In addition, tons of untreated sewage enter the estuary daily. This estuary opens up to Sydney Harbor, facing the North Atlantic Ocean.

The Sierra Club brought, and continues to bring, attention to the widespread contamination and the concomitant health effects emanating from the Sydney Tar Ponds. According to their research, “Just upstream from the tar ponds, the 51-hectare coke oven plant is now a broken field of coal-black rubble and wild grass. Scientists...do not know if the grasses growing across the 51 acre plant are transforming the poisons, or causing them to become airborne. Benzene, toluene, kerosene, naphthalene, and tar are some commercial byproducts created by the coke plant. Above the coal plant, just beyond a bright yellow mountain of pure sulphur, is a century-old dump. A 76-metre-high mound of garbage topped by an aging incinerator spews deadly mercury from its stack. A bright orange waterway running through the dump was once a healthy brook. The massive area between the tar ponds and steel mill is known as the ‘high dump.’ It is a long hill of slag and industrial waste. No one has even begun testing soil here. When it rains, puddles turn fluorescent green. Perhaps most disturbing is that the area is still being used as a clandestine dump. Truckloads of undocumented industrial junk are dropped amid the slag every week.” The coke plant’s benzene tank leaked for years and the 160-kilometer maze of underground pipe beneath the old plant has ruptured.

The vast toxic zone borders human settlements: homes, ball fields, playgrounds, schools, shopping areas. The Sierra Club cited that in July, 1998, tests confirmed the poisonous waste had invaded lawns, a brook where children play and the groundwater beneath local streets. On the most contaminated block, Frederick Street, the homes border the toxic brook and dump site contaminated with arsenic, molybdenum, benzene, antimony, naphthalene, lead, toluene, tar, benzophrene, kerosene, copper far exceeding allowable levels.

The Canadian government and the provincial government of Nova Scotia started to clean up the site beginning in 1986, with a cost sharing arrangement. However, nothing was done until 1991 when Sydney Tar Ponds Cleanup Inc. was established to supervise the first phase of clean up. This involved constructing a low-temperature incinerator to burn the toxic sludge, even though high temperature incineration was the standard practice for burning toxic chemicals. Ultimately, the incineration plan was abandoned in 1993. Another effort was attempted in 1995 and dropped the following year.

In January 1997 the Canadian government funded a Joint Action Group (JAG), consisting of three levels of government and citizen representatives. By this point the cleanup was estimated to take at least 10 years and cost up to $1-billion. One and a half years later, the JAG process bogged down. Inspired by a Sierra Club-sponsored community exchange project, local citizens of Cape Breton formed their own environmental group, called HELP, to directly organize and lobby for complete remediation.

This group pushed for resettlement of the families living on Frederick Street.

Public information and heightened awareness about the Sydney Tar Ponds pressured local and national government to address the chronic environmental health problems suffered by Cape Breton residents. The steel and mining industries formed the economic backbone of the area, while insidiously poisoning the local land, air and water. Although residents suspected environmental pollution as the source of their excessive cancer rates, they first needed to increase knowledge among public officials before any governmental action would be taken. This local Canadian environmental health problem points to the global blight of industrial pollution facing so many communities. In this sense, it is to the benefit of other citizen’s facing similar conditions, that knowledge about the tar ponds and coke ovens of Cape Breton be expanded.

Worldwide contraceptive prevalence (the percentage of couples currently using contraception) is now estimated to have reached 58 per cent, with average levels of use higher in the more developed regions than in the less developed regions, at 70 and 55 per cent respectively. In the more developed countries of Europe, Northern America and Australia and New Zealand, nearly three quarters of married couples currently use a method of contraception. In contrast, the average contraceptive prevalence in Africa and the developing countries of Oceania is 20 and 29 per cent, respectively. The range in contraceptive prevalence is from just 8 per cent in Western Africa to more than 80 per cent in Eastern Asia. To date, the highest levels of contraceptive use among all countries of the world are reported by Hong Kong and China (86 and 83 per cent respectively). In fact, the very high level of use in China, home to more than one quarter of the world’s population, inflates the average for Asia. Excluding China, average prevalence in the less developed regions hovers around 42 per cent. Nearly all developing countries have experienced an increase in contraceptive prevalence over the recent past. Prevalence increased by at least 10 percentage points over the past decade in more than two thirds of the countries with available trend information and use rates are expected to continue to increase.

**Source:** UN Press Release, (DESA) POP/710, 19 March 1999

- German Environment Minister Juergen Trittin said that work on a nuclear waste storage dump will be halted in keeping with the government’s plans to phase out nuclear power.

**Source:** Energy Central News - Feb 2, 1999

- Spurred by the 1987 Montreal Protocol the global production of chlorofluorocarbons (CFC’s), compounds that deplete the earth’s protective ozone shield, decreased by 50% in 1997. Falling for the ninth straight year, CFC output has dropped 88% below 1988 levels.

**Source:** Vital Signs, 1998, Worldwatch Institute

- Almost half of Finland’s parliament deputies elected in the recent elections oppose building that nation’s fifth nuclear power reactor.

**Source:** Energy Central News - March 24, 1999

- Green power has emerged as the choice of Californians during the first year of the state’s competitive electric market, which has allowed consumers to choose their own power companies since March 31, 1998. The focus of power marketers has shifted from offering the cheapest power possible to offering the greenest blend feasible.

**Source:** Energy Central News - March 25, 1999

- Currently, some 90 countries regulate tobacco in various fashions, but only about a third use tobacco taxes to help reduce smoking and lower smoking’s cost to society. In Norway, just the tax for a pack of cigarettes is $5.23 vs. $2.61 per pack in France; $1.59 per pack in Italy; and .66¢ per pack in the U.S.

**Source:** Smoking and Health Action Foundation, Ottawa, Canada

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**Examples of New Technologies which Have Positive Health and Environment Impacts**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Positive impact on health and environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved biomass stoves/burners</td>
<td>Reduced indoor/outdoor air pollution</td>
</tr>
<tr>
<td></td>
<td>Greenhouse gas “neutral”</td>
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<tr>
<td></td>
<td>More efficient fuel wood use</td>
</tr>
<tr>
<td>Biogas stoves and lights</td>
<td>Reduced indoor/outdoor air pollution</td>
</tr>
<tr>
<td></td>
<td>Reduced dependence on power supplies</td>
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<tr>
<td></td>
<td>Improved recycling of organics</td>
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<td>Heat pump technology for space heating</td>
<td>Negligible indoor/outdoor air pollution</td>
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<td>No greenhouse gas emissions</td>
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<td>Photovoltaic energy conversion systems</td>
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<td>Reduced dependence on power supplies</td>
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<tr>
<td>Genetically improved crops*</td>
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<td></td>
<td>Reduced dependence on pesticides</td>
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<td>Catalytic converters and lead-free petrol</td>
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<td>Electric vehicles</td>
<td>Reduced air pollution from cars</td>
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<td></td>
<td>Reduced emission of air pollutants along roads</td>
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<td>HCFCs and HFCs as CFC alternatives</td>
<td>Reduced stratospheric ozone depletion</td>
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<td>Fiberglass cabling for telephone lines</td>
<td>Vastly reduced use of copper</td>
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<td>Low water-use irrigation systems</td>
<td>Reduced water use and waterlogging</td>
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<td></td>
<td>New alloys and plastics in manufacturing industry</td>
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<td>Reduced waste</td>
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<tr>
<td>Biological pest control methods</td>
<td>Reduced use of toxic chemicals</td>
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*While the two benefits identified are accurate the health deficits remain unknown*

**Source:** United Nations Environment Programme, http://www.unep.org
TRENDS IN ENERGY USE, BY SOURCE, 1990–97

<table>
<thead>
<tr>
<th>ENERGY SOURCE</th>
<th>ANNUAL RATE OF GROWTH (percent)</th>
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<td>Wind power</td>
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*Energy use measured in varying units: installed generating capacity (megawatts or gigawatts) for wind, geothermal, hydro, and nuclear power; million tons of oil equivalent for oil, natural gas, and coal; megawatts for shipments of solar photovoltaic cells. *1990–96 only.


Since 1980, the U.S. and Europe have done a good job of reducing sulfur dioxide emissions as is shown in the chart below. Unfortunately, because Asia’s emissions have increased so dramatically, total emissions from these three regions have actually increased.


The U.N. Food and Agriculture Organization ("FAO") reports that between 1980 and 1995 the global extent of tree plantations (reforestation) roughly doubled... from 90 million hectares in 1980 to 180 million hectares, just slightly smaller than the land area of Mexico, in 1995. Of further encouragement, most developing countries with large plantation estates reported plans to double their plantation areas by 2010.


Communities are returning organic materials to soils at a growing rate in the 1990’s, especially in developed countries. While global data is not available, the U.S. and Europe have seen a sharp increase in composting of municipal organic waste and the reuse of human waste. U.S. composting facilities grew more than fourfold between 1989 and 1997 and in the U.S. and in Europe almost 40% of sewage sludge is land-applied. That being said, composting rates for this waste in major industrialized nations averaged only 11 percent in the early 1990’s.

SOURCE: Biocycle Magazine, July 1997

Russia, Japan, Italy and virtually all the countries of Eastern Europe have 2.1 or fewer children per woman and total population is projected to decline by 2050.

SOURCE: International Monetary Fund

Between 1975 and 1995 world recovered paper volume more that doubled from 49 million tons to 114 million tons. During the same period, the wastepaper recovery rate... the share of paper used that is recovered... increased from approximately 38 percent to 41 percent. Germany leads the world in paper recycling, recovering 67 percent of it's original consumption. The U.S. by comparison, recovers 45 percent and Italy, only 29 percent.


Brazil, like all Latin American countries, has seen a dramatic decline in it's fertility rate over the last generation. In 1960, a Brazilian woman on average had more than six children over her lifetime; today, her counterpart has just 2.3 children.

SOURCE: http://www.popin.org

UNEP endeavours to prevent rather than repair environmental.

Every nation in the world will be touched by Y2K related failures to some extent, according to a review conducted by the US Central Intelligence Agency (CIA) and presented to the U.S. Senate Special Committee on the Year 2000 Technology Problem. The CIA’s assessment remains that it currently does not see a danger of unauthorized or inadvertent launch of ballistic missiles from any country due to Y2K problems. CIA research has identified those areas most likely to affect U.S. interests as: foreign nuclear reactors and power grids, military early warning systems, trade, oil and gas sectors, and worldwide shipping and air transport. Malfunction of navigational equipment either aboard or external to cargo ships may occur, resulting in collisions or groundings, either of which could cause environmental problems.

The CIA found the lowest level of Y2K preparedness in Eastern Europe, Russia, Latin America, the Middle East, Africa and several Asian countries, including China. In Western Europe, the intelligence agency found that modification of computer systems to accommodate conversion to a new currency has taken precedence over Y2K problems. In Russia and Ukraine, Y2K failures could lead to power outages in the midst of harsh winter weather. The review found the potential for Y2K problems in Russia’s Gazprom natural gas pipeline network which transports natural gas through 148,233 kilometers (91,900 miles) of pipeline. The CIA is watching carefully the vulnerability of Soviet designed nuclear power plants throughout the nations of the former USSR, Central and Eastern Europe.

Foreign strategic missile systems, particularly in Russia and China, may experience Y2K-related problems. Missile-related concerns involve the vulnerability of environmental control systems within silos to Y2K disruption. Sensors and controllers need to be Y2K safe. Liquid-fueled missiles within silos must be monitored for fuel leaks. Optimum temperature and humidity levels must also be maintained within the silos.

The Bulletin of Atomic Scientists says the Y2K problem originated with the National Bureau of Standards. In 1967, and again in 1970, the Bureau of Standards wrestled with whether to make a four digit or a two digit number the computer standard for expressing the year. The Pentagon, then the world’s largest computer user, successfully pressured the bureau to make a two digit date the preferred option for federal agencies.

**CHEMNOBYL UPDATE**

Twenty years after the meltdown at Three Mile Island, the nuclear industry has succeeded in ways that were hard to imagine in March of 1979 a Pennsylvania cowered in fear, plants around the country lost their luster and scores of half-built reactors were abandoned. The industry is doing better now, but ironically extinction is in sight.

Today, reactors are quietly producing about one-quarter more electricity each, and the level of radiation exposure to workers is down along with the number of automatic shut-downs. Uranium fuel is cheap and plentiful, and, with low interest rates, so is nuclear power’s biggest ingredient, capital. The industry has also happily achieved a lowered public profile.

Reactors are a bit like the Concorde, the supersonic transport planes that first flew a few days before the Three Mile Island accident, or the Apollo moon rockets, which made the last of their flights to the moon a few years before. They are technological artifacts of an era slipping into history.

Cloning the best practices from one utility to another, policing each other, getting more output from the reactors, the industry essentially adopted the Greenpeace motto: a nuclear accident anywhere is a nuclear accident everywhere. It vowed to have no more meltdowns. Not counting the 1986 catastrophe at Chernobyl, where the nuclear reactors are of different design, the industry has so far succeeded.

**Global Nuclear Energy**

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage of Energy Produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithuania</td>
<td>82%</td>
</tr>
<tr>
<td>France</td>
<td>76%</td>
</tr>
<tr>
<td>Belgium</td>
<td>60%</td>
</tr>
<tr>
<td>Ukraine</td>
<td>47%</td>
</tr>
<tr>
<td>Sweden</td>
<td>46%</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>45%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>44%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>41%</td>
</tr>
<tr>
<td>Slovenia</td>
<td>40%</td>
</tr>
<tr>
<td>Hungary</td>
<td>40%</td>
</tr>
</tbody>
</table>

Percentage of energy produced by nuclear power plants for the 10 nations with the highest reliance on nuclear energy. The United States produced 20 percent of its electricity from nuclear power in 1997.

**Source:** New York Times, March 7, 1999

The meltdown at Three Mile Island 20 years ago set off a crisis in nuclear power. Now, half the plant is running and half remains shut.

If two decades ago nuclear power seemed forbidding and secret, today anyone can log on to Nuclear Regulatory Commission Web site, which offers detailed specification for each reactor (http://www.nrc.gov/AEO/phot/lib.html). Another table for Three Mile Island shows the temperatures at which the emergency systems will automatically start, with different numbers depending on how many coolant pumps are running.

But elsewhere technology is accelerating, too. Natural gas becomes cheaper to find and recover, and the system for turning it into electricity has improved steadily. The newest plants produce twice as many kilowatt-hours from a thousand cubic feet as the ones that nuclear power was competing within 1979.

The real reactor killer, according to Professor Corradini and others, is something that was not thought of in 1979 — deregulation in the utility industry. Nationwide, power companies that will distribute electricity and sell it to consumers (like local phone companies) and other companies that will generate power and compete to sell it (like long distance carriers). If electricity is completely deregulated, the market price will be about 2 cents per kilowatt-hour at the wholesale level, a price that about 28 nuclear plants cannot achieve.

**Source:** New York Times, March 7, 1999
DID YOU KNOW?

- A new study suggests exposure to pesticides in the womb or at an early age may cause children to suffer permanent brain defects. Widely used pest-killing chemicals, in amounts routinely found in farm areas, seem able to skew thyroid hormones, which control how the brain of a fetus or young child develops, says the recent study published in the journal *Toxicology and Industrial Health*. The study and other recent research support an emerging theory that pesticides may exact a toll on the intelligence, motor skills and personalities of infants, toddlers and preschoolers. In tests in Mexico, scientists found striking differences in hand-eye coordination and other mental and physical skills when comparing preschoolers in an agrarian region with those in adjacent foothills where no pesticides are used. Four- and five-year-olds in the agrarian area had trouble performing simple motor skills and had had poorer memory skills. Farm and household pest killers are widely used there, and high levels of multiple pesticides have been found in the cord blood of newborns and breast milk of mothers.

SOURCE: *The Ottawa Citizen*, March 15, 1999

- The *British Medical Journal* estimates that tobacco today is killing four million people each year, half in the rich nations and half in the Third World. In the U.S. today, 33% of all deaths of people between the ages of 35 and 69 are attributable to tobacco. By the year 2030, tobacco is expected to be killing 10 million people each year, 70% of them in the Third World. In China alone, 100 million young men alive today will die due to smoking.


- On January 14, after an 8-year scientific review, Canada rejected Monsanto corporation’s request for approval of its genetically altered milk hormone, rBGH, that makes dairy cows produce 10% more milk than normal. This was Monsanto’s first genetically-engineered product. Canada rejected rBGH because, as the product label acknowledges, it can cause udder infections, painful, debilitating foot disorders, and reduced life span in treated cows. The U.S. Food and Drug Administration (FDA) approved the use of rBGH in U.S. dairy cows in November, 1993, without taking a position on the issue of cruelty to animals. Monsanto will not reveal how widely the drug has been adopted by U.S. dairy farmers. Monsanto will ask the World Health Organization’s Codex Alimentarius to declare the hormone safe when Codex meets in Rome this coming summer. If Codex issues the statement that Monsanto wants, under the World Trade Organization’s rules, Canada will lose its right to ban the use of rBGH within its borders. Codex Alimentarius is widely perceived to be dominated not by public-spirited health specialists but by scientists aligned with the interests of transnational corporations.

SOURCE: *Rachel’s Environment & Health Weekly* #639, February 25, 1999

- Depression is in pace to be the world’s second most disabling disease (after heart disease) by the year 2020; already the World Health Organization ranks it first among women and fourth overall.


- The United States consumes 25% of the world’s oil, almost all of it for transport. The U.S., however, has the world’s lowest petroleum taxes.

SOURCE: *The Economist*, March 12, 1999

- 1998 was by far the warmest year recorded during the past 600 years.

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### Sulfur Dioxide Emissions from Fossil Fuel Burning in Asia, Europe, and the United States, 1980–2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Europe (million tons of sulfur dioxide)</th>
<th>United States</th>
<th>Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>59</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>1990</td>
<td>42</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>1995</td>
<td>31</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>2000</td>
<td>26</td>
<td>15</td>
<td>53</td>
</tr>
<tr>
<td>2010</td>
<td>18</td>
<td>14</td>
<td>79</td>
</tr>
</tbody>
</table>

freshwater fish species have been pushed to the edge of extinction from contaminated water. The amount of fresh water on the planet is finite — less than a million cubic kilometers. The populations of water-short countries, today estimated to be 550 million, are expected to increase to 1 billion by the year 2010. Water shortages will be especially adverse for agriculture, which takes 70-80 percent of all available fresh water in the world.

**SOURCE:** Joint UNEP and United Nations University (UNU) News Release, Nairobi, March 18 1999

- Women and girls in developing countries spend more than 10 million person-years in aggregate each year fetching water from distant, often polluted sources, noted by Klaus Toepfer, Executive Director of the United Nations Environment Programme (UNEP).

**SOURCE:** Joint UNEP and United Nations University (UNU) News Release, Nairobi, March 18 1999

- A study conducted by a project team for the Annie E. Casey Foundation reports several indicators of success in community programs that offer low-income people opportunities to learn to use computers and on-line communications. A survey was conducted in five different cities of successful programs that work with children, youth, and adults who want to explore new technologies and acquire specific skills, such as English literacy, office computer applications, and using the Internet. Successful programs were found to have the following characteristics: a qualified staff and participants who associate computer proficiency with success in school and in the workplace; address a wide variety of needs and interests both community and individual; are popular with all ages; develop appropriate curriculum; obtain necessary

(by thermometers, tree rings and ice cores) — nearly one degree Fahrenheit warmer than 1997 the second-warmest year. The extreme warmth of 1998 was accompanied by the following signs of “climate chaos” reported by the British *New Scientist* magazine: record-setting forest fires in Florida, Indonesia, Brazil, Russia, and southern Europe; bush fires in northern Australia; floods and accompanying mudslides in California and coastal Peru and Ecuador (where 50,000 were left homeless); major flooding in east Africa; Hurricane Mitch, which killed more than 20,000 people in Honduras, Nicaragua, and El Salvador and devastated the economies of central America; drought in New Guinea; intense drought and famine in southern Sudan; drought in central America that left the Panama Canal too shallow for many ships to pass through; failed coffee crops in Indonesia and in Ethiopia; failed sugar and rice crops in Thailand; failed cocoa and rubber crops in Malaysia; cotton crop failure in Uganda; and warm ocean currents that reduced the Peruvian fish catch by 44%.

funding: and keep equipment and software up-to-date. Challenges include overburdened agency managers, elaborate reporting requirements for obtaining and maintaining funding, and the rapid change in computing.

**SOURCE:** "Computer and Communications Use in Low-Income Communities: Models for the Neighborhood Transformation and Family Development Initiative." Internet address: http://www.ctcnet.org/casey/

- Human activities continue to increase the supply of nitrogen that can be used by plants, a trend that effectively raises the fertility of the world. Nitrogen fixation... the conversion of atmospheric nitrogen to a form plants can use... has more than doubled over it's natural, preindustrial level. Nitrate pollution, which results principally from overfertilization, can be very damaging. Nitrate pollution, for example, is regarded as one of the most serious water quality problems in Europe and North America. Nitrate pollutants, above maximally allowable levels, can be converted to potential carcinogens when digested by humans, and can cause brain damage or even death in infants by affecting the oxygen carrying capacity of the blood.

**SOURCE:** Human Alteration of the Global Nitrogen Cycle: Causes and Consequences (Washington, DC, Ecological Society of America, 1997); UN Organization for Economic Cooperation and Development.

- Fish farming known as "aquaculture" has become a $40 billion industry that didn’t exist prior to 1984. China is the world’s leading producer accounting for 61 percent of all "farmed fish". Today one out of every five fish eaten is raised on a farm.

**SOURCE:** UN Food and Agriculture Organization (FAO)

Developing countries must focus on using their indigenous music, exotic foods, culture, art and crafts, and on adding value to them.

**SOURCE:** Our Planet, Volume 10, Number 1, 1999
Voices

The United Nations International Conference on Population and Development (ICPD), held in Cairo, Egypt, in 1994, will be reviewed in a Special Session of the UN General Assembly June 30-July 2, 1999 in New York. As part of the preparatory process for the five year review of the ICPD Programme of Action, NGOs were invited to give their views during the annual Population and Development Commission meeting, March 22-30, 1999, chaired by H.E. Anwar Chowdhury, Permanent Representative of the Mission of Bangladesh to the UN.

Statement by World Information Transfer, Inc., to the Preparatory Committee for the ICPD + 5 Process, March 26, 1999

Mr. Chairman, Distinguished Delegates,

World Information Transfer, Inc., places great emphasis on the health of children. Healthy children are the nation's future, therefore, we must first recognize the primacy of children's rights. We can start by implementing laws that would provide a responsible family for every child that is born. A family that is aware of the needs of every child, not as a slave to its own existence binding that child to traditions that negate health, but as an individual with rights of its own. It is in the interest of governments to provide basic needs to its citizens as a means of protecting the health of children.

The cost of housing and food would also be limited if governments recognized that their primary interest should lie in the future, that is, in fostering the growth of children who are physically capable of becoming productive, creative citizens.

No nation can maintain a healthy economy when significant parts of its population are malnourished or traumatized or suffering the effects of chronic exposure to pollutants. In the past five years, since the ICPD in Cairo, scientific research has more clearly revealed the human health impacts of environmental contamination. We have indisputable evidence of rising rates of cancers, tuberculosis, lung diseases, and reproductive impairments, as well as the appearance of vector borne diseases in areas not previously afflicted.

One critical consequence of maintaining traditional practices and viewpoints is the deterioration of human health around the world. Understanding our culture and history enhances our capacity to respond creatively to our present problems rather than being enslaved by them. We must use our endowed creativity to reach beyond the cultural and traditional control of practices that doom humankind to repeat its past mistakes, learn from those mistakes and move in new directions.

"Children are key when pursuing a future of equity and social justice. Mothers are key to the lives of their children and to the building of healthy families and populations. The most sustainable investment we can make in healthy populations is to take proper care of our children's health." – Kofi Annan, UN Secretary-General, 1997

Safe & Secure: Eliminating Violence Against Women and Girls in Muslim Societies, by Mahnaz Afkhami, Greta Hofmann Nemiroff, and Haleh Vaziri in consultation with Affa Dirani Arsantos, Asma Khaled, and Marilyn Tadros, published by Sisterhood Is Global Institute (SIGI). This manual’s purpose is to assist women to identify sources of violence in the family, community, society, and state; communicate this information; and influence governments to formulate and implement policies that eliminate gender-based violence. The authors developed this manual to train trainers who work with service providers such as police, doctors, and judges, or grassroots-level women and men, and women’s rights activists. The book contains thirteen case-studies of violence against women and girls in Muslim societies, based on factual accounts collected by SIGI. The order in which the case studies unfold represents an escalation from psychologically damaging to life-threatening forms of violence. Each case study is followed by a series of questions and interactive learning exercises that are intended to stimulate discussion and the development of strategies for dealing with violence against women and girls. For more information about the manual, please access: http://www.sigi.org/Programs/VAMP/index.htm; or contact Sisterhood Is Global Institute, 4343 Montgomery Avenue, Suite 201 Bethesda, MD 20814, USA.

In Rajasthan, India, voluntary agencies have worked out a new software program which will help villagers predict their drinking water supplies. Called SimTanka, this free computer software is meant at simulating performance of rainwater harvesting systems with covered water storage tanks under the influence of a fluctuating rainfall. Such systems are called Tanka in the western parts of Rajasthan. The software claims that it helps the user find the minimum catchment area and the smallest possible storage tank that will meet the demand with probability of 95%. The Ajit Foundation in Jaipur, developed this free software in the spirit that it might be useful for meeting the
water needs of small communities in a sustainable and reliable manner. according to a spokesperson for the foundation. SimTanka runs on Windows 95. Further information is available from Vikram Vyas, The Ajit Foundation, 396 Vasundhara Colony, Tonk Road, Jaipur 302 018, India visquar@jl1.vsnl.net.in

SOURCE: Frederick Noronha fred@vsnl.com

■ Galilee College, Israel, will hold a special course on the subject of Environmental Management on Oct. 13 - Nov. 1, 1999. The course is designed for senior environmental officials and professional planners from African and Asian countries. The College will grant full tuition scholarships to candidates who hold senior positions poses at least a BA or BSc degree and are fluent in English. Candidates for the scholarships must citizens of a Developing Country. Additional information can be obtained from Ms. Yael Strausz, Director, International Department, Galilee College, Tivon Israel 36000, fax: 972-4-9830227; email: galicol@netvision.net.il

■ Sustainable Fisheries: Options for the Future, A Marine Stewardship Council (MSC) Conference, 19 - 20 April 1999, New York, USA. Topic: The Crisis in World Fisheries. The mission of the Marine Stewardship Council, established in 1997, is to work for sustainable marine fisheries by promoting responsible, environmentally appropriate, socially beneficial and economically viable fishing practices. The purpose of this MSC Conference is to focus world attention on the serious crisis facing the marine environment as a result of over-fishing and examine some possible solutions. Contact information, Brendan May, External Affairs Director, on +44 171-3501231.

■ Endocrine Disruptor Video Series from World Wildlife Fund. To assist educators in teaching their students about endocrine disruption, World Wildlife Fund (WWF) has produced a set of five video presentations featuring leading scientists in the field. The video presentations provide basic information and are specifically designed to facilitate discussion in under-graduate and graduate level courses. An overall recommended readings list is also provided. The presentations are available on video-cassette for loan. Requests can be made through the Interlibrary Loan Department in local libraries by directing the request to: Librarian, World Wildlife Fund, 1250 24th Street NW, Washington, DC, 20037-1175 (email: carla.langveveld@wwfus.org). Loans cannot be made to individuals.

■ Working Group on Girls web site: http://www.girlsrights.org This is a readable, attractive site developed for the NGO Committee on UNICEF, Working Group on Girls. The site offers pertinent information on international issues regarding the girl child as well as the working group itself.

■ Against The Grain: Biotechnology And The Corporate Takeover Of Your Food, Marc Lappe and Britt Bailey, (Monroe, Maine: Common Courage Press, 1998). Lappe and Bailey propose that the genetic engineering revolution has nothing to do with feeding the world's hungry and criticize Monsanto's aims in producing genetically engineered seeds and crops. The authors argue against Monsanto's claims that genetic engineering is essential if the world's food supply is to keep up with human population growth. They point out that if genetically engineered crops were aimed at feeding the hungry, then Monsanto and the others would be developing seeds with certain predictable characteristics that would feed people, not animals, and benefit the small farmer. None of the genetically engineered crops now available, or known by the writers to be in development accomplish this. The new genetically engineered seeds produce crops largely intended as feed for meat animals, and harvesting the crops requires the intense use of pesticides. Available from Common Courage Press, P.O. Box 207, Monroe, ME 04951, Tel. (207) 525-3068

“Sustainable development: ...development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

SOURCE: UNIDO United Nations Industrial Development Organization

MISSION STATEMENT

We have not inherited the world from our forefathers... we have borrowed it from our children.

—Kashmiri Proverb

World Information Transfer, Inc. (WIT) is a not-for-profit 501(c3) non-governmental organization in consultative status with the United Nations, promoting environmental health and literacy.

In 1987, inspired by the Chernobyl nuclear tragedy, WIT was formed in recognition of the pressing need to provide accurate actionable information about our deteriorating global environment and its effect on human health to opinion leaders and concerned citizens around the world.

WIT exercises its mandate through:

1. The publication of the World Ecology Report, a quarterly digest of critical issues in health and environment, published in five languages and distributed to opinion leaders around the world, and for free in developing countries.

2. Our annual conference on Health and the Environment: Global Partners For Global Solutions held at United Nations headquarters in New York since 1992. The world’s leading authorities in the field of environmental medicine share their latest findings and discuss possible solutions with leaders in governments, business, organizations and the media.

3. Since 1995, WIT has been providing and promoting humanitarian relief to areas devastated by environmental degradation. Supplies and equipment have been sent to hospitals and orphanages in areas contaminated by the Chernobyl fallout. This program has been rapidly expanding since its inception.

4. Centers for Health & Environment providing centralized scientific data pertaining to health and sustainability issues. The objective of the Centers is to provide continuous monitoring, ongoing research, education and implementation of corrective programs. The first center was opened in Kiev in 1992 and moved to Lviv in 1996. The second center opened in Beirut, Lebanon in 1997.

WIT currently operates from headquarters in New York City with regional representative offices in Australia, Austria, Canada, China, Colombia, Egypt, Germany, Holland, Honduras, India, Iran, Israel, Lebanon, Nigeria, Pakistan, Philippines, Russia, Switzerland, Ukraine.

WIT is on the Executive Board of CONGO (Conference of Non-Governmental Organizations in Consultative Relationship with the United Nations) and is vice-chair on the DPI/NGO Executive Committee.

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HOW YOU CAN HELP:
WIT is a non-profit, international, non-governmental organization, in consultative status with the United Nations, dedicated to forging understanding of the relationship between health and environment among opinion leaders and concerned citizens around the world. You can help us with your letters, your time, and/or your donations.

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Spring 1999
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POINT OF VIEW: Sustaining a Global Economy

[Excerpted from International Herald Tribune, Paris, Tuesday, January 19, 1999 "It's Getting Late to Switch to a Viable World Economy," by Lester Brown, President, and Christopher Flavin, Senior Vice-President of the Worldwatch Institute]

We approach a new century with an economy that cannot take us where we want to go. Satisfying the projected needs of 8 billion or more people with the type of economy we now have is simply not possible. The Western industrial model - the fossil-fuel-based, automobile-centered, throw-away economy that so dramatically raised living standards in this century - is in trouble.

The shift to an environmentally sustainable economy may be as profound a transition as the Industrial Revolution. But the broad outlines of a sustainable economic system that can meet the human needs of the next century are beginning to emerge.

The foundation of such a system is a new design principle, one that shifts from the onetime depletion of natural resources to an economy based on renewable energy and which continually reuses and recycles materials. A sustainable economy will be a solar-powered, bicycle/rail-based, reuse/recycle economy, one that uses energy, water, land and materials much more efficiently and wisely than we do today. Building an environmentally sustainable world economy depends on a cooperative global effort. No country acting alone can protect the diversity of life on earth or the health of oceanic fisheries.

So far, national governments have largely failed effectively to implement the last decade's landmark environmental treaties on climate change and biodiversity. One of the big challenges of the early 21st century will be to fulfill their ambitious promises to stabilize the climate and slow the destruction of species.

Without a concerted effort by the wealthy to address the problems of poverty and deprivation, building a sustainable future may not be possible. Growing poverty, and the political and economic chaos that can be provoked by it, reverberate around the world, as was seen in 1998 with the Asian economic meltdown, which pushed tens of millions of people below the poverty line in just a few months. Meeting the needs of the more than a billion people now in poverty is essential to making the transition to an environmentally sustainable world economy.

We will also need a new understanding and values to support a restructuring of the global economy. The 21st century will require a new ethic of sustainability. We will need a new set of human responsibilities - to the natural world and to future generations - to go with our newfound human rights.

One key to reversing environmental degradation is to tax the activities that cause it. By putting a price on these activities, the market can be harnessed to spur progress. If coal burning is taxed, solar energy becomes more economically competitive. If auto emissions are taxed, cleaner forms of transportation become more affordable. The new German government has embarked on the world's most ambitious environmental tax reform, reducing taxes on wages by 2.4 percent while raising energy taxes by an identical amount. This is a landmark step that will push Europe's largest economy in an environmentally sustainable direction.

Europe is also leading the way in some of the industries that are the foundations of a solar economy. For example, it has added 5,000 megawatts of wind power in the last five years, half of it in Germany, where Schleswig-Holstein gets 15 percent of its electricity from the wind. Wind power, now one of Europe's fastest growing manufacturing industries, employs thousands of workers. Sales of other new energy technologies are soaring as well. The production of solar photovoltaic cells has doubled in the last five years, propelled in part by the Japanese government's efforts to promote solar rooftops as a standard option for new suburban homes. Fuel cells that turn hydrogen into electricity, with water as the only by-product, are being spurred by billions of dollars of investment capital, as companies pursue them as a replacement for everything from the coal-fired power plant to the internal combustion engine.

The effort to replace today's unsustainable economy with one suited to the demands of the 21st century will create some of the new century's largest investment opportunities. Bill Ford, incoming chairman of the Ford Motor Co., has plans to increase profits by replacing the internal combustion engine that was at the center of his great-grandfather's success. "Smart companies will get ahead of the wave," Mr. Ford says. "Those that don't will be wiped out."

The challenge now is to mobilize public support for a fundamental economic transformation, a shift to a 21st century economy far less resource-intensive and polluting yet even more productive than today's.

"Never doubt that a small group of thoughtful committed citizens can change the world. Indeed it's the only thing that ever has."

Margaret Mead