Health and Environment

Briefing Paper

HEALTH AND ENVIRONMENT: Supporting sustainable livelihoods

INTRODUCTION

The state of human health globally serves as a key indicator for the conditions of the natural environment and the success of sustainable development. Sound development is not possible without a healthy population. Most development activities affect the environment in a way that typically causes or exacerbates health problems. At the same time, a lack of development adversely affects the health of many people (Agenda 21).
Sustainable development has been recognised as a key principle for the development of environmental health, since it embraces empowerment and equity issues as well as environmental impacts. Prosperity, equality, better health and the environment are inter-related elements towards obtaining a better future. Promoting health is important, both in its own right, and because good physical and mental health contributes to people's ability to participate fully in society and the economy.
Principle 1. of the Rio Declaration UN Conference on Environment and Development 1992, states "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature." The World Health Organisation (WHO) defines health as "a state of complete physical, social and mental well-being and not merely the absence of disease or infirmity. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being, without distinction of race, religion, political beliefs, or economic and social conditions." (WHO 1948). This definition has remained unchanged since that date.
Health issues, like pollution, crosses national boundaries. The WHO estimates that poor environmental quality contributes to 25 percent of all preventable illnesses in the world today. Better health management can be effective in addressing some of the most pressing sustainability issues, including poverty eradication and changing unsustainable consumption and production patterns. These issues are not new but what is often lacking is the political will to make the necessary changes. Back in 1994, the International Conference on Population and Development, in Cairo, called for countries to give "priority to measures that improve quality of life and health by ensuring a safe and sanitary living environment for all population groups through measures aimed at avoiding over-crowded housing conditions, reducing air pollution, ensuring access to clean water and sanitation, improving water management, and increasing the safety of the workplace."

This paper presents some of the most pressing global and regional environmental health problems and the strategies that need to be reinforced at Earth Summit 2002 (Figure 1.).

ISSUES: PROGRESS AND CHALLENGES

Chapter 6 of Agenda 21 (1992) highlights the interlinked nature of health and development. "Both insufficient development leading to poverty and inappropriate development resulting in over-consumption, coupled with an expanding world population, can result in severe environmental health problems in both developing and developed nations." Action is needed to try and tackle these problems, through addressing the primary health needs of people, as they are central to the achievement of the goals of sustainable development and primary environmental care. Such strategies for action include:

- Meeting primary health care needs
- Reducing health risks from environmental pollution and hazards
- Controlling communicable diseases
- Meeting urban health care challenge
- Protecting vulnerable groups

Figure 1. Regional health trends

Asia and Pacific	* Some 75% of the world's poor people live in Asia. At least 1 in 3 Asians have no access to safe drinking water and at least 1 in 2 has no access to sanitation. Asia's rivers contain 3 times as many bacteria from human waste (faecal coliform) as the world average and more than 10 times the OECD average. * The limiting factor to producing more food in the future will be an increasing lack of freshwater supplies for the region. Contamination by pollutants has seriously degraded water quality, thereby reducing the availability of clean water available. By 1995, most Asian cities were already facing an acute shortage of safe drinking water. In China, India and Indonesia, twice as many people are dying from diarrhoeal diseases than from HIV/AIDS (WaterAid 2002) * Urbanisation is one of the most significant processes impacting health in Asia and the Pacific. Asia's particular style of urbanisation – towards megacities – is likely to further exacerbate environmental and social stresses. In the early 1990's, 10 of Asia's 11 megacities already exceeded WHO guidelines for particulate matter by a factor of at least 3. Levels of smoke and dust are twice the world average, and 5 times as high as industrialised countries and Latin America. A large percentage of industrial wastes in SE Asia, including hazardous chemicals, are discharged without treatment, affecting both workers and local residents health.
Africa	* UNDP (1997) estimate that almost 40% of people in sub-saharan countries live below the poverty line. Africa is the only continent where poverty is expected to rise in the next century (UNDP 1998). * More than 300 million people still lack reasonable access to safe water. 14 countries are subject to water stress/ water scarcity & a further 11 will join them by 2025. * In many sub-Saharan countries, life expectancy fell to below 45 years during the 1990's owing to the impact of HIV/ AIDS. Over 25 million people are infected with HIV/AIDS; 13.2 million children have been orphaned. Women's lives are threatened by HIV/AIDS, and about 500,000 women in Africa and Asia die annually as a result of causes related to pregnancy & childbirth. * Life expectancy examples: Congo - 42.5 (Male) 42.8 (Female); Gambia 46.9 (m) 46.6 (f); Burkino Faso – 35.4 (m) 34.1 (f) Sierra Leone – 29.7 (m) 29.3.(f); South Africa – 43 (m) 43.5 (f). Deaths from malaria (1998 estimates) – 961,000 people: Incidences of infection – 237,647,000 people. * Malaria has slowed economic growth in endemic countries in Africa by up to 1.3% per year. * Annual population growth in half of the sub-Saharan countries is falling by 0.5%-1.2% as a direct result of AIDS* As a result of declining food security, the number of undernourished people has doubled from 100 million (late 1960s) to 200 million (1995).
Europe and Central Asia	Central Asia * In Asia, poverty remains a significant problem especially in S. Asia where 39% of the population is below the poverty line. * There has been a marked decline in infant mortality, from 68 per 1000 births to 59 per 1000 (1995) although great disparities still exist in Asia. * In many Asian countries, life expectancies are now comparable with those of middle to high-income countries. Examples: India 52 (male) 51.7 (female); China 60.9 (m) 63.3 (f); Singapore 66.8 (m) 68.9 (f). * S.E Asia malaria deaths 73,000, incidences 1,579,1000 Europe * Declining life expectancy, especially for men, and health situation in Eastern Europe is thought to be due to lifestyle (smoking & diet), medical care and environmental factors such as urban pollution and drinking water quality. Life expectancy examples: UK 69.9 (male) 71.4 (female); Sweden – 71.4 (m) 73.3 (f) Czech Republic 62.9 (m) 68.3 (f); Romania 59.5 (m) 64.0 (f). * Declining water quality in Europe is linked to significant pollution by nitrates, pesticides, heavy metals and hydrocarbons. 60% of large cities in Europe are over-exploiting their groundwater resources. * Although there are improvements in air quality, WHO research shows that about 25 million urban dwellers are still exposed at least once a year to levels above WHO Air Quality Guidelines. * Tobacco deaths for European WHO Region – 1,273,000 (1998).
Latin America and Caribbean	* In Latin America, the income of the richest 20% of the population is 19 times that of the poorest 20% (compared to 7% for industrialised countries). * In San Paulo & Rio de Janeiro, air pollution is estimated to cause 4,000 premature deaths a year. 38% of the total population of the Caribbean (more than 7 million people) are classified as poor. * Life expectancy is increasing – 28% between 1960-1994. Healthy life expectancy estimates at birth: Brazil: 54.9 (male) 59.2 female. Cuba: 65.1 (male) 66.7 (female) Peru: 57.8 (male) 59.8 (female) Jamaica: 64.0 (male) 65 (female). * Infant mortality decreased 45% between 1980-1990. Most common causes of death are cardio-vascular & cancer. * Mortality due to violence, accidents and AIDS is increasing. * Chagas disease has infected more than 18 million people in Latin America.
North America	* North American's use more per capita energy and resources than any other region causing acute problems for the environment and human health. * Environmental health problems of particular concern are associated with agricultural and industrial pollutants. * Canada & the USA are, overall, the world's largest consumer of water (per capita) * Over 90% of children are now immunized in the America's. * Life expectancy estimates: Canada 68.3 (male), 71.7 (female); USA 67.2 (m) 68.8 (f)

Sources: UNEP GEO 2000: WHO World Health Report 2001, UN Economic & Social Council

Meeting primary health care needs

People's health is not just a matter of choice or circumstances but a result of many interconnected factors. These factors also affect a person's ability to reach their full potential. The need for equitable access to primary health care was reiterated as one of ten Commitments agreed by representatives from 180 countries at UN World Summit for Social Development (1995). As well as supporting primary health care initiatives to meet basic health needs for clean water, safe food and sanitation, issues that need to be tackled include: establishing appropriate level primary health care systems (pre-natal, reproductive health, immunisation etc); increasing access to information, health education and training of health care professionals, literacy, access to drugs/medicines, capacity building and addressing particular issues related to vulnerable Groups.

Reducing health risks from environmental pollution

Climate Change and Human Health

Adverse impacts on human health that arise from climate change have been linked to human activities that alter the chemical composition of the atmosphere through the build up of green house gases - primarily carbon dioxide, methane, and nitrous oxide. These human activities include the large-scale burning of fossil fuels such as coal, gas, and oil. If atmospheric concentrations of greenhouse gases continue to increase, the average global temperature is set to increase by 1 to 3.5 degrees Celsius by the year 2100 (ACSH).

Disruption from climate change affects people who are already most disadvantaged and vulnerable, especially those living in tropical and low-lying areas. Direct health effects occur through rising temperatures, flooding and droughts, whilst many of the indirect public health effects occur more gradually through the effects of climate change on agriculture, infectious disease transmission. According to the Climate Change and Human Health report by a Task Group of the World Health Organisation (WHO) in 1996, the most serious effects of climate change on human health will be the increase in the incidence of vector-borne infectious diseases such as malaria. Shifting of climate patterns, leading to rises in sea level and extreme weather events, will also impact upon ecosystems which, in turn, increases the risk of vector-borne diseases. Climate change could allow malaria-carrying mosquitoes to become established over a wider geographical area, increasing the risk of infection to more of the world's population. No such as vaccine yet exists for malaria, that has affected over 500 million people in 90 countries, causing 1.5 - 2.7 million deaths per year (WHO 1997). As well as increasing human vulnerability to disease, extreme weather events have the capability to result in fatalities. For example, the mixing of sewage and drinking water that occurs during severe floods means that waterborne diseases, including diarrhoeal diseases, is likely to increase with climate change.

Many approaches are required to minimize and reduce global climate change. First of all, measures must be taken to reach the goal of stabilizing greenhouse gas concentrations in the atmosphere at a level that does not dangerously interfere with the climate. The Kyoto Protocol, linked to the UN Framework Convention on Climate Change, creates the structure for governments to reduce one key greenhouse gas - carbon dioxide - but massive action and change in consumer behaviour is also necessary to cut back on emissions of all 'greenhouse gases'. Policies are required to ensuring adequate sewage treatment and providing potable (drinking) water in areas vulnerable to floods. Ecosystem management can be applied to help increase the natural protection of vulnerable areas e.g. through increased forest cover acting as a flood barrier and soil protector. Communities at risk need to be prepared to take emergency responses, and should be invited to help identify suitable contingency measures.

Ozone Depletion

The thinning of the ozone layer has been well documented, showing that an increase in UV radiation is reaching the earth's surface, disrupting biological processes and damaging natural and artificial materials. Health impacts include skin cancer (non-melanoma and melanoma), premature ageing of the skin, cataracts, and diminished cellular immunity. Decreased immunity may increase the severity of infections and reduce the effectiveness of vaccinations. Scientists have confirmed that non-melanoma skin cancer is caused by UVB, and that a sustained 10% depletion of the ozone layer would lead to a 26% percent increase in non-melanoma skin cancer. This could mean additional 300,000 cases worldwide every year (ACSH). At the ground level, photochemical oxidants, including ozone, can cause eye, nose and throat irritation, chest discomfort and premature ageing of the lungs (WHO 1997 a.). A potentially more dramatic effect is a decrease in food production due to the negative effects of stratospheric ozone depletion on certain plants and animals. These indirect environmental health effects are, however, less eas-

ily quantified than the direct effects on humans making it harder to regulate and mitigate the effects.

Although the consumption of ozone-depleting substances is declining due to consumer pressure (and with the implementation of the Montreal Protocol on the Ozone Layer), the impact of past emissions will continue for years with its detrimental consequences. Additionally a new problem is emerging in relation to the substitute compounds to those products that previously contained ozone-depleting substances, these products whilst not impacting the Ozone layer have a different negative effect of releasing new Green House Gases, with resultant climate change impacts. Co-operation over international environmental regulation to address these problems in a more integrated way will be key to protecting the global environment and health.

Water Quality and Scarcity

Water scarcity and lack of quality water poses tremendous problems for the world's population. According to UN figures, half of the world's 6 billion people lack proper sanitation, and 1.2 billion do not have access to clean drinking water. Today, up to 300 million people face severe water shortages, and by 2050 two-thirds of the world's population could face water shortages (UN Conference on Water and Sustainable Development). According to UNEP's Global Environmental Outlook 2000, if present water consumption patterns continue, two out of every three persons on Earth will live in water stressed conditions by the year 2025 (UNEP).

Almost half of the human population suffers from diseases related to insufficient or contaminated water. The majority of these people live in developing countries, and are poor. Water-borne bacterial contamination has the most devastating impact on women and children who lack basic food and sufficient access to doctors and medicine. Poor water quality is also directly linked to the problem of water borne diseases, including Schistosomiasis which infects some 200 million people per year from drinking water that contains the parasitic worm. Additionally, millions of people every year contract diseases transmitted by insects whose larvae live in water. More than 250 million people annually thus contract malaria through living in proximity to stagnant water, 90 million contract, filariasis, 30 to 60 million have contracted, dengue fever, and some 18 million people, have contracted river blindness in this way (ACSH). The World Bank has indicated that malaria has a substantial economic impact through losses of productivity, school absenteeism and treatment costs. With no vaccine yet fully developed, both the vector mosquito and malarial parasite are becoming resistant to existing repellents and drugs. The UN-supported "Roll-Back Malaria" initiative reports that expenditure by the pharmaceutical industry on anti-malarials and vaccine research is steadily decreasing. The companies argue they see no adequate commercial returns to offset the high R&D costs.

There are clear social problems that are linked to water scarcity and lack of clean water. Regions that face water scarcity will be unable to achieve food self-sufficiency. As competition grows between urban and rural water users, and countries and regions, environmental security that is linked to access to water, will become an increasingly important aspect of national defence. Key infrastructure, such as dams, irrigation systems, desalination plants and reservoirs could become direct targets in war.

Possible remedies to tackle water problems include, improving knowledge about water resources, optimising water resources through management at the local water-basin level, and development of regulatory tools at global and regional levels to enable effective and integrated water resource management. More research on drinking water quality and devising better policies by bringing together experts and representatives from different groups, including those most effected such as women, poor and indigenous communities, to help establish a clearer picture of the situation and to stimulate debate and cooperation between different sectors has been identified as the way forward.

Air Pollution

Air pollution is a major environmental health problem affecting the developing and the developed world alike. The pollutants consist of gaseous pollutants and suspended particulate matter, such as dust, fumes, mist, and smoke. With population growth, increased energy generation, industrialization and increased vehicle use, outdoor air pollution has worsened in most large cities in many developing nations, especially in Asia.

The health links to air pollution are considerable. On a global basis, estimates of mortality due to outdoor air pollution range from around 200,000 to 570,000 people. According to WHO, industries without proper regulatory control of emissions are a major source of air pollution. Adverse health effects include coughing, bronchitis, wheezing, heart diseases, and lung cancer. Many of the air pollution's health effects are acute or short term, and can be re-

versed if exposures to air pollution decline. However, other effects appear to be chronic such as lung cancer and cardiopulmonary disease. The most vulnerable groups are typically infants and older people. In Latin America, where there are approximately 81 million city residents, more than one quarter of all city dwellers in the region are exposed to high air pollution levels. This is believed to cause an estimated 65 million days of illness in this region each year (HEAP).

The World Bank has designated indoor air pollution in developing countries as one of the four most critical global environmental problems. Here pollutants potentially injurious to health are released in close proximity to people. In developing nations, some 3.5 billion people continue to rely on biomass for their energy requirements. These traditional energy sources include wood, charcoal, agricultural residue, and animal waste. Indoor air pollution causes illnesses such as acute respiratory infections in children, chronic obstructive lung diseases such as asthma and chronic bronchitis, lung cancer, stillbirths and other problems at birth. The greatest threat is to women and children living in poverty. In South Africa, investigators found that Zulu children living in homes with wood stoves were almost five times more likely to develop a respiratory infection severe enough to require hospitalisation.

In order to address the problems of air pollution, countries and regions need to develop policies that follow quality standards set by the WHO, and address air pollution in the context of their existing environmental, social, economic and cultural conditions. Agreements such as the Kyoto Protocol of the UN Framework Convention on Climate Change seek to encourage government regulation of emissions involving the private sector. A similar convention could be adopted to support reduction in the other major air pollutants. Campaigns and outreach programs are needed to educate people about the hazards of indoor air pollution and help them, where possible, reduce such hazards. Investment to reduce air pollution is also necessary. This will include support for research into the provision of alternative environmentally sound and clean fuels or technologies for domestic needs, such as solar cookers, as well as cleaner fuels to reduce outdoor emissions.

Dealing with toxic chemicals e.g. Persistent Organic Compounds (POPs)

Thousands of new compounds enter the environment every year, yet only a few of them have been fully tested for toxicity. The Persistent Organic Pollutants (POPs) are chemicals that resist degradation through in the environmental processes. They include a group of highly stable synthetic compounds used in agriculture and in industry. They can also be generated inadvertently as by-products of combustion or industrial processes (e.g. dioxin). POPs are now understood to be one of the most dangerous threats to human health and the environment today. They demand global concern since they are highly persistent in the natural environment, and can be transported to sites far from their places of origin, where they accumulate in the fatty tissues of most living organisms, poisoning humans and various forms of wildlife. POPs are toxic even at extraordinarily low concentrations, triggering potentially harmful effects at the cellular level. Reliable evidence links human exposure to specific POPs (or classes of POPs) with cancers and tumours at multiple sites; neurobehavioral impairment including learning disorders, reduced performance on standardized tests and changes in temperament; immune system changes; reproductive deficits and sex-linked disorders, amongst others (IPEN).

Particularly disturbing is the ability of these substances to become concentrated in human tissue and breast milk. These can then be passed to the developing foetus through the placenta, and to the young infant through breast milk. Even at very low concentrations (parts per trillion), these substances can have profound impacts on the development of the brain and reproductive system of children. The diseases caused by POPs mainly affect the endocrine, immune and nervous systems, generally have long-term latency periods and it is impossible to apply traditional concepts and models of toxicology and epidemiology,

Faced with this challenge, the world's governments, along with international institutions, must take action to establish a legally binding global programme of action designed to eliminate POPs and to tackle their anthropogenic (human) sources, including twelve POPs that UNEP has listed. The Stockholm Convention on Persistent Organic Pollutants is a legally binding international instrument aiming to reduce and eventually eliminate POPs. Once enforced, the Convention could contribute to a significant reduction in POPs in ratifying countries. However, much work remains to be done in identifying and monitoring new and existing POPS, as well as finding ways of removing them and remediation of the environment.

Genetically Modified Organisms and Biotechnology

The release of genetically modified organisms (GMOs) into the environment presents controversial hazards. Their

release may cause irreversible harm to the biodiversity of ecosystems, as well as to animal and human health. No risk assessment can ultimately ensure against such irreversible harm, and no one can predict the full and long-term consequences of releasing GMOs into the natural environment. For this reason organizations, such as ANPED – the Northern Alliance for Environment and Development, advocate that the Precautionary Principle should be applied for the use of GMOs, and criticise the current "wait and see what happens" attitude. In order to gain a more balanced and informed understanding of the positive and negative aspects of GMO's groups, such as Action Aid, are calling for broad consultation with stakeholders at national and international levels. To support this Action Aid has conducted a series of dialogues with a range of local farming communities to help them make a more informed decision on the utilisation of GMOs. ANPED, amongst others, are urging Governments to impose a 5-year freeze on the releases of all GMOs into the environment until such as a time as:

- the results of research exploring potential threats to human health and biodiversity are collected, evaluated and used in policy-making on GMOs;
- all International and regional agreements, i.e. Biosafety Protocol and Aarhus Convention, are fully implemented.
- Outstanding policy and legislative gaps are bridged, using national laws which need to be in place before the freeze is lifted, to ensure that the Precautionary Principle is being fully applied.

Funding for gene-technology research should focus on monitoring the environmental and health impacts of GMOs that have been already released. The socio-economic and ethical dimension of gene technology, including the potential to put patents on life and living organisms requires wider discussion. Governments should also weigh this technology up with the alternatives e.g. organic farming, permaculture and additional forms of sustainable agriculture. Greater action on "low-tech", less intensive and more environmentally sound approaches could be significantly scaled up through awareness-raising campaigns, education, training programs and better provision of economic incentives.

Moving on from food and agriculture, the use of biotechnology within medicine must be considered. We now, in theory, have the technology to reproduce human clones, utilise gene therapy to tackle particular diseases and other techniques, such as assessing the risk of contracting certain diseases through inherited defects. Whilst these approaches may carry considerable potential to benefit medical practice, they also raise substantial moral questions. Additionally, there is a need to ensure that safety and the precautionary principle are seen paramount not only for patients carrying a particular disease, but also for the world's population and environment as a whole.

Controlling communicable diseases – emerging and re-emerging infectious diseases

Infectious diseases remain the principal cause of human deaths world-wide. Dramatic changes in society, technology and the environment, coupled with the diminished effectiveness of certain approaches to disease control have propelled the world into a new era of disease transmission. The spectrum of infectious diseases is continually expanding. Many, previously viewed as 'conquered', are returning and becoming more prevalent. Others, are newly emerging and causing public health problems at varying levels of scale. Recent examples include the Ebola virus and the Human Immunodeficiency Virus (HIV leading to Acquired Immune Deficiency Syndrome (AIDS). Ebola emerged in Africa in 1976 with cases confirmed in four African countries (Côte d'Ivoire, Democratic Republic of Congo, Gabon and Sudan.

HIV/AIDS links the least and most 'developed' regions of the world and presents a unique challenge to sustainable development in the 21st century. Since the 1970's, AIDS has been responsible for the deaths of more than 21.8 million people, 4.8 million of them children. In 2000, approximately 3 million people died of AIDS, and an additional 5.3 million became infected with HIV (UNAIDS). In 2001, UNAIDS reported that 36.1 million people were estimated to be living with HIV or AIDS; a total that is expected to reach 47 million in 2010. In Sub Saharan Africa (with a total population around 800 million people) life expectancy is falling dramatically, at the same time, governments are failing to curb the spread of the virus that leads to AIDS. In several countries more than 20% of adults are infected with HIV. In the absence of low cost cures, 23 million Africans began the 21st century with a death sentence imposed by HIV (WRI 2000).

The HIV/AIDS epidemic must be thought of not merely as a disease but also as a behavioural issue. Successful prevention of HIV infection relates to social, cultural, economic, psychological and behavioural factors, in particular poverty eradication and gender equity are priority issues. In addition, people with HIV/AIDS require comprehensive support, not just increasing access to basic medical care (UNAIDS 2001). A multi-sector approach is required, in-

volving an integrated public and private sector response, and including religious institutions and NGO's. An inclusive debate involving policy-makers, the media, those working in HIV/AIDS care and prevention, and affected individuals and communities is also required. (Stakeholder Forum 2001). The issue of access to, and the cost of treatment must also be dealt with e.g. improving the availability and affordability of anti-retroviral drugs to suppress HIV and postpone the symptoms of AIDS.

There is international concern about the number of bacteria becoming resistant to commonly-used antibiotics. In many regions of the world, the low cost, first choice antibiotics have lost their ability to deal with infectious agents such as Esherichia coli, Neisseria gonorrhoea, Pneumococcus, Shigella, Staphylococcus aureus, leading to more costly and pro-longed treatment of common diseases such as epidemic diarrhoeal diseases, sexually-transmitted gonorrhoea, and pneumonia (WHO).

Meeting the Urban Health Challenge

By the year 2000, 50% of the world's population was living in cities, with the other half increasingly reliant on urban areas for their economic survival. More than 1 billion people live in poverty without adequate shelter. Lack of housing, inadequate water supply and waste treatment facilities threaten people's health with the vulnerable and disadvantaged groups suffering the most. In 1996, UNCHS reported that 30-60% of the world's urban population live in low-income countries, and lack adequate housing with sanitary facilities, drainage systems and piping for clean water. Environmental pollution in urban areas is linked to excess morbidity and mortality. Over-stretched services and declining air quality are also serious issues for cities in industrialised nations. Also the re-emergence of TB in a number of developing countries highlights clear links to increasing poverty and deprivation in urban areas.

Vulnerable Groups

Everyone should have the right to live in a healthy environment, yet such 'environmental justice' is denied to many on the grounds of income, race, gender, age, generational or geography. Environmental justice is rapidly becoming a key issue for communities, NGOs and policy-makers, as disadvantaged areas become dumping grounds or locations for chemical-producing factories.

Children (under 15 years of age) are particularly vulnerable to environmental health problems. Approximately one third of the world's population are children. At least 15 million children die annually from preventable causes. A growing number of diseases in children are linked to unsafe environments in which they learn and grow. Children are especially vulnerable to chemical and biological hazards in air, water and soil. They also suffer the greatest number of deaths due to diarrhoeal diseases (2.5 million deaths per year), this number is likely to be greatest for those in urban areas (GEO 2000). Air pollution from the burning of fossil fuels for cooking and heating is responsible for up to 20% mortality in children under five. Children's health and well-being in both industrialised and developing countries is also compromised by unsafe food and chemicals in household products and goods (WHO). Malnutrition robs children of opportunities later in life.

Other vulnerable groups with often very specific health needs include women, the elderly, people with reduced mobility, visual impairments or disablement through physical or psychological illness, ethnic minorities, and refugees. More demographically differentiated heath programmes is required to better reflect such variation.

SOLUTIONS AND PARTNERSHIPS

International frameworks for tackling health and sustainable development issues exist through UN Summit Conferences and their implementing bodies and related agencies. (Figures 2 and 3). As well as through non-binding instruments, Conventions and Protocols, and global health strategies from key institutions such as the WHO and other agencies. This section outlines some of the work of key institutions to meet these agreements and targets. It also outlines new proposals and recommendations put forward for a global response and consideration at WSSD.

Global Health Strategies

The key global taskmaster for Ch.6 of Agenda 21 is the World Health Organisation (WHO). One of it's key areas of work is the "Health For All" Strategy. As a specialised UN Body, the WHO works to obtain a level of health that will enable all citizens to lead socially and economically productive lives. Policy drivers of environment, health and sus-

tainable development are: Agenda 21; WHO Healthy Cities and similar campaigns and municipal groupings; and nationally and locally inspired environment and health action plans. WHO launched the global Health for All Strategy in 1977 (endorsed by all members states). Its aim was to reduce inequalities in health defined as a "state of physical, social and mental well-being and not merely the absence of disease or infirmity." In 1998, the WHO revised the Health for All Strategy by producing 21 targets in a framework for action (Health 21) intended to take the Health for All movement into the 21st century (WHO 1998). "Health for All" is not a single finite target but essentially a charter for social justice. The underlying principle is to reduce inequalities in health through multi-sectoral strategies involving communities and to find sustainable mechanisms for health improvement. It was recommended that multi-sectoral strategies for creating sustainable health need to address:

- The biological basis for health;
- Physical and socio-economic determinants of health;
- Healthy Lifestyles (Choices & behaviour/Reducing harm from alcohol, drugs, and tobacco);
- Settings to promote health (Multi-sectoral responsibility for health)

The Healthy Cities Project has developed as part of the WHO European Region's response to the Health for All Strategy. It is a global initiative, yet most of the cities are in Europe. It is a long-term urban health and development initiative which acts to improve the health and well-being of people living and working in cities. It especially addresses the settings approach as emphasised by the WHO Ottawa Charter (1986) "*Health is created and lived by people within the setting of their everyday life; where they learn, work, play and love*". The quality of the environment and the nature of development are major determinants of health (WHO Healthy Cities Project 1997). It has identified fixed determinants such as age, sex, and hereditary factors. Whilst variable determinants include individual lifestyle factors, social and community influences, living and working conditions, socio-economic, cultural and environmental conditions.

National Strategies

In Europe, one of the key responses at the national level has been the creation of National Environment and Health Action Plans (NEHAPS). The development of NEHAPS provides Governments with a framework for bringing policy drivers in environment and health together within the context of sustainable development. By 1999, 43 countries of the European Region of WHO had developed, or were developing, such plans. The process has also drawn attention on the need to address local needs, and highlighted different ways of working (WHO 2000).
NEHAPs cover:

- The institutional framework that underpins the regulatory and service provisions that ensure high and improving standards of environment and health;
- The management of information systems;
- How various environmental pathways affect the environment and health, and their control;
- The inter-action between major economic sectors and environment/health;
- A country's special international contribution to improving environment and health.

Local action plans for health

The WHO notes that national authorities cannot normally solve local environment and

Figure 2. Key examples of Environmental Health Convention and Protocols

UN Convention on Biological Diversity (1992): Sets out international measures aimed at preserving vital ecosystems and biological resources upon which we all depend. Contents include conservation of biodiversity, sustainable use of biodiversity and fair sharing of the benefits arising from exploiting such use. Health implications include access to genetic resources and biotechnology.

UN Framework Climate Change Convention (1992): The 1997 Kyoto Protocol commits signatories to legally binding cuts in greenhouse gas emissions.

Persistent Organic Pollutants (POPs): A legally binding instrument to reduce and eliminate these synthetic toxic compounds.

Agreement on Prior Informed Consents on Hazardous Chemicals (1998): The Rotterdam Convention intended to enable the world to monitor and control trade in dangerous pesticides and chemicals.

Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes: As a legally binding instrument, signatories will be required to take appropriate measures to provide an adequate drinking water supply; provide sanitation of a standard which protects human health and the environment; ensure adequate safeguards against water-related diseases, and building effective systems for monitoring. Progress will be reviewed at the 2004 WHO Ministerial Conference.

Human Rights: the "right to health" includes aspects relating tackling diseases, access to facilities, to adopt a gender perspective (Committee on Economic, Social and Cultural Rights General Comment 14.

Figure 3. Millennium Development Goals (MDGs)

The Millennium Development Goals (MDGs) - the global targets agreed by world's leaders at the Millennium Summit in September 2000 – set an ambitious agenda for reducing poverty, and its causes and manifestations. At the current rate of progress none of the goals are unlikely to be reached. UNDP are tasked with making them part of the UN's work and they are a focus for UNDP's involvement in the World Summit for Sustainable Development 2002.

Goal 1: Eradicate extreme poverty and hunger	Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger. Indicators: Prevalence of underweight children (under 5); Proportion of population below minimum level of dietary energy consumption.
Goal 4: Reduce Child Mortality	Target 5: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate. Indicators: Under 5 mortality rate; infant mortality rate; Proportion of 1 year old children immunised against measles.
Goal 5: Improve maternal health	Target 6: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio. Indicators: maternal mortality ratio; proportion of births attended by skilled health personnel
Goal 6: Combat HIV/AIDS, malaria and other diseases	Target 7: Have halted by 2015, and begun to reverse, the spread of HIV/AIDS Indicators: HIV Prevalence among 15-24 year old pregnant women; Contraceptive prevalence rate; Number of children orphaned by HIV/AIDS. Target 8: Have halted by 2015, and begun to reverse, the incidence of malaria and other major diseases. Indicators: Prevalence and death rates associated with malaria; proportion of population in malaria risk areas using effective malaria prevention and treatment measures; prevalence and death rates associated with tuberculosis (TB); Proportion of TB cases detected and cured under DOTS (Directly Observed Treatment Short Course).
Goal 7: Ensure environmental sustainability	Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water. Indicator: Proportion of population with sustainable access to an improved water source.
Goal 8: Develop a Global Partnership for Development	Target 17: In co-operation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries. Indicator: Proportion of population with access to affordable, essential drugs on a sustainable basis.

health problems efficiently. This is due the fact that national authorities can be too removed from local experiences. Yet devolution of responsibility solely to local government is not the answer either because of the multi-disciplinary nature of most environment and health problems. Linking health, environmental and socio-economic improvements at the local level requires inter-sectoral efforts (e.g. education, housing, public works and community groups, including businesses, schools and universities, and religious, civic and cultural organisations) aimed at enabling communities to achieve sustainable development. This approach is backed by WHO health promotion research which "indicates that when the community has input into the development of strategies there is greater acceptance, awareness, ownership and compliance".

Stakeholder proposals

Some additional issues, proposals and recommendations put forward by stakeholder groups to tackle gaps and constraints in the health sector are identified below.

Poverty eradication

Many groups addressing existing inequalities in access to information and health services advocate the need for further financing and aid packages to assist the provision of basic health needs. They also call for recognition that measures for promoting better health in poor populations lead to:

- greater productivity and economic growth,
- prevention of infectious diseases,
- mass immunization programmes to address the 'vaccine gap' between rich and poor worldwide,
- controlling measures for infectious and parasitic diseases linked to poor environmental conditions and poverty, which disproportionately affect the lives of the poor and seriously impact on economic development,
- increasing HIV/AIDS access to information about prevention,
- social reform through employment, livelihood initiatives, education and literacy programmes,
- addressing malnutrition,

- strengthened multi-sectoral responses;
- recognition of specific health needs of marginalised and vulnerable groups including refugees and victims of conflict,
- adopting a new focus on global environmental justice and health rights.

Access to adequate basic needs

Basic access is seen as a crucial need, including access to clean water, sanitation, food, housing, education, public health services, transport. Activities to increase access should address the provision of infrastructure and means of implementation, including finance and aid packages, as well as the provision of low cost alleviation measures e.g. oral rehydration salts, birth control, mosquito nets etc. In addition education and literacy initiatives should be seen as fundamental elements. Furthermore planning systems which tackle urban migration and settlements need to be developed and implemented.

With specific regard to food security, implementation of regional and national food self-sufficiency is a key goal for improving the environment and overall health. This would seek to fulfill the World Declaration and Plan of Action on Nutrition (WHO/FAO 1992). Furthermore, the production and consumption of foods must aim to promote public health and reduce or eliminate the causes of premature deaths. Promotion of sustainable consumption habits should be linked to good food production practices. For example, buying food that is produced in conformity with minimum safety and labour standards. This must be part of an overall plan to promote healthier diets, and as a means of shaping overall consumer habits. The World Summit should also seek to promote work-based nutritional programs, to highlight the importance of individual health and well-being in every worker, uniquely related to both gender and age differences (ICFTU).

Access to adequate healthcare

Governments need to make healthcare a national priority, and to seek means of involving existing stakeholders in new, more effective partnership. There needs to clarification of agreements on trade, aid and pharmaceutical provisions. Development of widespread immunization programmes against preventable diseases is required. HIV/AIDS activities should be integrated into overall development strategies and programmes, as should malnutrition strategies. Access to basic drugs for physical and psychological health should build upon strengthened multi-sector responses. Health promotion programmes should be further utilized and tiered pricing structures need to be linked to pharmaceuticals. Health care systems should undergo reorientation to deal with chronic diseases which require long-term care. There is also an urgent need for improved data gathering and sharing, alongside health surveillance, monitoring and further development of risk assessment methodologies.

Infrastructure development

Priority measures are necessary to provide access to basic infrastructural needs such as clean water and sanitation. Financing and reform measures should address the deterioration in public health infrastructure. Reinforcement of infrastructure is especially important in vulnerable countries and regions to reduce the impacts from climatic and environmental changes. Again data gathering and monitoring of potential impacts of global threats, disease-inducing mechanisms and vulnerability of populations needs to be improved. Co-ordinated international efforts must be targeted at disaster prevention and mitigation. Planning systems should be activated to tackle urban migration, escalating urban growth, and population over-crowding.

Social reform

To make health care a national priority, effective partnerships need to be established to reduce inequality and misallocation of resources. This includes increasing social responsibility within the pharmaceutical industry, patent laws and biotechnology implications. In addition efforts should be made to reverse the low social status of women and adopt a gender perspective in decision-making. Intensified efforts by the global community to improve women's health, and to reduce health implications of harmful practices on female children. Transparency in decision-making and strengthened multi-sector responses as well as better targeted, low-cost prevention and care strategies, and dialogue with stakeholder groups e.g. certain religions over barriers to medical care and preventative strategies will help strengthen governance issues. In addition the linkages between health, globalisation, trade and aid need to be clarified. Training and capacity building in governments may be necessary to assist this process, particularly towards building more effective and equitable ways of delivering social services, and adopting la-

bour and social legislative changes that boost people's rights.

Equity of information transfer

Promotion of health 'literacy' needs to be extended in the media, schools, workplace, use of information and computer technology. It should also aim to address information needs of vulnerable groups, particularly women and children in developing countries. Local and national health and development plans, and health impact assessments should be developed. Improved health information systems and indicators will be a crucial part of this process. The Rio Principle 10 on access to information, participation in decision-making and access to justice in relation to environmental matters needs to be implemented at the national and local levels.

THE WAY FORWARD – ASSESSMENT OF FUTURE SUSTAINABILITY

Indicators to monitor and measure progress

Regardless of the outcomes of the World Summit on Sustainable Development, it will still be necessary to monitor health issues and assess whether we are successfully tackling the most pressing issues. The WHO Healthy Cities work (1997) makes it clear that the assessment of health is complicated. Although there are widely accepted indices for death (mortality) and disease (morbidity), few generally accepted measures exist which can adequately compare people's physical and psychological well being. Despite this, WHO's Healthy Cities work has been at the forefront of work measuring progress on health through the use of indicators (Figure 4).

Institutional roles and responsibilities

International and UN Level

More collaborative approaches are necessary to address issues of health and environment in the wider context of sustainable development. Partnerships and collaborative decision-making must be encouraged to involve all levels of government, business, nongovernmental organizations, community groups and the public at large. For governments and international organizations, this means using their powers to convene, facilitate and support collective responsibility. This will include setting goals, creating incentives, monitoring performances and providing information. The principle goals include:

- Strengthening health and environmental-sector representation in decision-making, including the full participation of major groups;
- Addressing population issues in basic health systems;
- Assuring that health is integrated into environmental impact assessment and poverty planning;
- Increasing public awareness of global health and environmental issues through education (primary, secondary and adult);
- Enhancing multidisciplinary research by focusing on the linkages between health and environment;
- Building on the achievements of existing programs (if possible) developed individually and jointly by the UN agencies, governments and relevant groups in civil society;
- Increasing resources for the environment and improving strategic planning for the environment that include clear goals and performance measures;
- Strengthening the regulatory framework, improving ecosystem monitoring and reporting;
- Increasing multi-stakeholder participation and actively identifying opportunities for multi-sector partnerships.

The WHO priorities for Earth Summit 2002 are: to tackle the negative impact of ill-health on socio-economic development; address the linkages between environmental degradation; reduce unsustainable consumption patterns and health; as well as encourage new partnerships and reform measures, within and outside the health sector (Stakeholder Forum 2001)

Regional/National Levels

Governments and international organizations should play a stronger role in encouraging further partnerships be-

Figure 4. Examples of Health and Sustainability Indicators	
Social	Life expectancy at birth, by sex Reduced rates of population growth, Percentage of population with access to drinking water, to sanitation Percentage of infants with low birth weight Infant mortality- decrease in infant mortality rates by economic and social groups Diseases of the circulatory system per 100,000 TB cases per 1000 population
Environment	Decreased number of people living in areas that fail to meet air quality standards Decreased number of people whose drinking water fails to meet national safe drinking water standards Decrease in diseases and deaths from environmental exposures (toxic/chemical), including occupationally related illnesses.
Economy	Increases in per capita GDP and NDP Increases in the number, wage level, and quality of jobs (as measured, for example, by the percentage of jobs at or below minimum wage). Decreased number of people living below the poverty line, percentage of population living poverty Number of hospital beds/100,000, number of physicians/100,000

tween the public and the private sectors in health promotion and protection. Moreover, they must build up greater institutional capacity in the concrete implementation of those goals, from the point of conception and planning, to the management and evaluation of suitable health and environmental policies and operational elements at community, local, national, regional, and international levels.

Private Sector

The government and the private sector could jointly support the internalisation of environmental costs to enhance environmentally sound investments. The government should also enforce legislation as appropriate, while encouraging self-regulation by the private sector. Businesses need to build the practice and skills of dialogue and consultation with communities and citizens, participating in community decision-making and opening their own values, strategies, and performance to their community and the society.

NGOs and wider civil society

Advocacy groups, NGOs and Community-based Organisations, as well as civil society need to help create open, constructive and inclusive debates that engage the private and the public sectors. Moreover the need for greater capacity for creating, processing and managing scientific information and more transparency of decision-making in all sectors involved are of utmost importance. The WHO Healthy Cities movement has shown that grass-roots activity and involvement by communities and supportive municipal administrations can significantly help to foster improvements in environment and health.

Women

In addressing inequalities in health status and unequal access to health care services between women and men, Governments and other actors should promote an active and visible policy of mainstreaming a gender perspective in all policies and programmes, so that, before any decisions are taken, an analysis is made of the effects for women and men respectively. (UN Women's Fourth World Conference on Women, Beijing, 1995)

Trade unions and workers

Particularly in relation to occupation health and safety, the WSSD offers an opportunity to focus on the impacts of new emerging diseases and their impacts on the quality of the working environment. For example, HIV/AIDS is predicted to have the greatest impact on the work force, skilled and unskilled alike. The consequent fall in numbers of people in key sectors such as teaching will further impact the ability of a country to educate and train new entrants to the labour market. Work-place health and safety can serve as an effective barometer of quality of life and public health. The recent Gothenburg report calls for greater promotion of health and safety at work, with a view to reducing accidents and work related illnesses. The "eminent persons" report from Europe and North America for the Johannesburg Summit process suggests that workplace health and safety and wider environmental concerns

should be better integrated. This would be in line with the 1999 World Health Organisation Ministerial Declaration which links the two Joint Trade union/employer workplace health, safety, and environment (OHSE) committees to serve as models for both industry and communities. Occupational health and safety professionals and worker representatives need to extend their knowledge of how health relates to environmental issues. To this end, Governments should be encouraged to adopt the recently-developed International Labour Organisation (ILO) Guidelines on Occupational Safety and Health Management Systems, as well as to ratify instruments that deal with increasing action and involvement of the public, including their access to environmental information (i.e. the Aarhus Convention on Access to Information, Justice and Public Participation for environmental issues) as well as by workers e.g. through the ILO Occupational Safety and Health Convention 155.

CONCLUSIONS

Globalisation involves so much more than just trade and communications, it is also linked positive and negative changes cutting across many important social and environmental issues, including health and the environment. We touched on some of the more negative aspects in this paper, including spread of infectious diseases, drug problems and environmental damage. Other threats specific to health and the environment include the growing insecurities associated to war and civil strife, toxic dumping, increasing wealth inequality and severe poverty. The quality of people's environment is one of the principal causes of a differentiation between peoples' health, including life expectancy. Another startling possibility is that serious physical and mental health problems of poor people are not only the result of a lack of clean water, a adequate shelter, sanitation and basic services but also linked to chronic stress and social alienation (Wilkinson 1996).

It is clear that the problems related to health and the environment will be insoluble without tackling poverty head on. Equitable access to health care also depends on a large-scale reallocation of global resources – the basis for action must be a global consensus on values that seek to build upon just and equitable principles (Stakeholder Forum 2001). In relation to this some key questions that will need to be addressed in run-up to Earth Summit 2002 and beyond:

- In a globalising world, does our understanding of sustainable development principles allow us to make choices and decisions that lead to better health for all?
- What are countries doing to guarantee rights to health, and how can the UN and stakeholders ensure this is adequate?
- What are key players doing to promote the right to health and what should/could they be doing?
- Have we got the right systems and structures to deliver change?

The Summit process is an opportune time to take into account the large cross-over between issues and sectors as they relate to health and the environment, and indeed poverty eradication. It should be used to encourage broad and integrated action to seek to enhance these areas in support of our immediate and long-term development needs.

REFERENCES

ACSH - The American Council on Science and Health - Global Climate Change and Human Health. Global Climate change and health impacts http://www.acsh.org/publications/reports/global.html

Canada - Stratospheric Ozone: The health impacts of living with ultraviolet radiation http://www.ec.gc.ca/ozone.uvhealth.htm

IPEN (International POPS Elimination Network) http://www.psr.org/ipen/platform.htm
IPEN http://www.ipen.org

Stakeholder Forum (2001) Online Debate September 2001 www.earthsummit2002.org website, particularly www.earthsummit2002.org/ic/health/healthv2.htm

UN (2000) Millennium Development Goals: http://www.undp.org/mdg

UNAIDS (2001) Press Release June 2001. UNAIDS Joint Programme on HIV/AIDS.
Partner organisations are: UNICEF; UNDP; UNFPA; UNESCO; WHO; World Bank and UNDCP. http://www.unaids.org

UNCED (1992) Agenda 21: Chapter 6: Protection and Promotion of Human Health. http://www.earthsummit2002.org/toolkits/women/un-doku/un-conf/ag21chap6.htm

UN CSD (2001) Tenth Session. UN Economic and Social Council http://www.un.org/esa/susdev/csd10/ecn/72001-pc6.doc

UNEP (2000) Global Environmental Outlook 2000. http://www.unep.org/GEO2000/english/00235.htm

WHO (1986) Ottawa Charter for Health Promotion. WHO. Geneva.

WHO (1996) Executive Summary World Health Report 1996: Fighting Disease, Fostering Development. Geneva, Switzerland: World Health Organization, 1996:6.

WHO a. (1997) European Sustainable Development and Health Series No.1. Sustainable Development & Health: Concepts, principles and framework for action for European Cities and Towns. WHO. Geneva.

WHO b. (1997) World Health Report 1997: Conquering Suffering, Enriching Humanity. Geneva

WHO (2000) A sourcebook on implementing local environment and health projects. WHO/CIEH. Geneva.

WHO (2001) Annex Table 4 on Healthy Life Expectancy http://www.who.int/whr/2001/main/env/annex/annex4/htm

WHO Regional Office for Europe & Healthy Cities Project: http://www.who.dk
A full range of publication on Healthy Cities can be accessed at the WGO website http://www.who.dk/healthy-cities

Wilkinson, R. (1996) The Afflictions of Inequality. Routledge, New York.

World Resources Institute (2000) State of the World Report 2000-2001. People and Ecosystems: The Fraying Web of Life

This paper was produced as part of the “Towards Earth Summit 2002” project. The text was developed by World Information Transfer (http://www.worldinfo.org) with additional material from Jan McHarry (Stakeholder Forum). Additional contributions on genetically engineered food and agriculture were presented by ANPED, Northern Alliance For Sustainability, and on occupational health and safety by ICFTU/TUAC, International Confederation of Free Trade Unions. Additional thanks to Chris Church (ANPED), Rosalie Gardiner and Georgina Ayre (Stakeholder Forum). April 2002.