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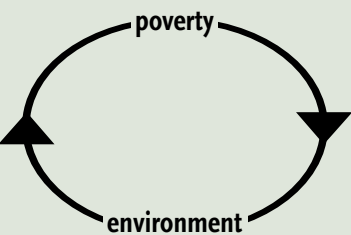
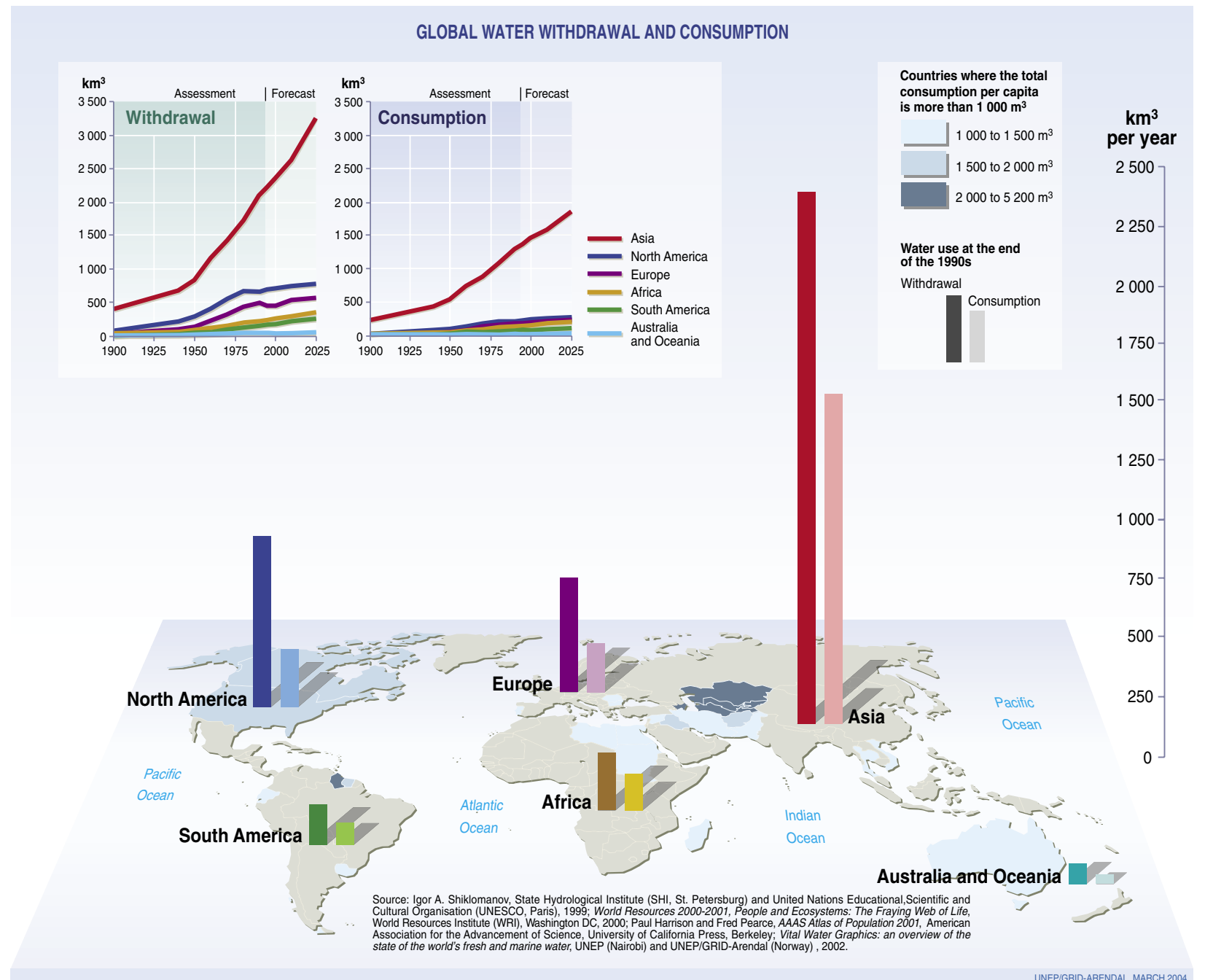


Diagram showing the cyclical relationship between environment and poverty (source unknown)

Editorial The GRID-Arendal editorial team

Welcome to the second edition of Poverty & Environment Times, the fourth in the Times series leaving the ateliers of UNEP/GRID-Arendal (two polar, two poverty). The current issue is dedicated to the Global Ministerial Environment Forum being held in Jeju, Korea in March 2004.

We (the Times), too, want to be a forum with the simple ambition



The environment, the wealth of the poor?

Bakary Kanté

The poor and the rich share at least one inescapable common fate: they live on the same planet and depend on the same natural resources for their survival. But rich and poor live in two separate worlds. The poor, who to a large extent operate outside the money-based economy, have (especially in rural areas) close ties with the environment. The rich, who "create" and use the money-based economy, exploit the resources of the environment without really being part of it. There is consequently a fundamental opposition in the approach of rich and poor to the environment, one category contributing with varying degrees of violence to the destruction of our natural habitat, the other depending on it simply to survive.

The rich do not only opt to live at some distance from the poor. They also tend to distance themselves from the environment. With money they can buy services to mitigate the environmental damage caused by economic activities, filtering water and purifying air, for instance. But none of that is possible without money. For the poor, nature offers a series of goods of inestimable value, on which they depend absolutely:

that sums up their life. Environmental damage, which often only represents a financial loss for the rich, is a much more serious matter for the poor, leading to the loss of their livelihood.

Until now, little has been done to protect the natural environment in poor areas, the excuse being that improving the living conditions of the poor improves the environment too. International agencies have therefore focused much of their attention on the social and economic aspects of the fight against poverty. But no-one pays a higher price – in time, energy, health, etc. – for environmental damage than the poor. In fact, protecting their natural surroundings is every bit as urgent as solving other problems.

The greatest source of concern is that in an extraordinarily rich world, poverty should persist at all. None of the agreements resulting from the Uruguay Round (within the General Agreement on Tariffs and Trade, GATT) caters for even the most basic demands of underprivileged peoples. The World Bank has encouraged developing countries to draw up poverty reduction strategies – formal frameworks for increasing international funds available to programmes supporting the poor. This initiative only address-

es a small part of the problem however. The question of complementary actions that need to be taken to combat poverty is still an urgent priority.

It is common practice to define poverty exclusively in financial terms. Yet someone surviving on one or two dollars a day in a run-down environment may well be far worse off than someone else, without any income at all, but living on fertile land. We are not trying to idealise poverty or the non-monetary means of subsistence available to the poor, but we should try to convince people that alternative solutions do exist.

The challenge facing us is to make two fundamentally different perceptions of the environment coexist. One category sees the environment as a natural asset, a resource to be exploited for profit, taking into account the fact that taken together, the natural and human assets must remain constant. For the other category, the environment is an invaluable source of subsistence, which must be exploited but also protected so that it remains renewable and consequently permanent.

We must focus our efforts on boosting the skills of vulnerable populations,

while taking into account their deep-rooted understanding and experience of their natural habitat, to protect it. This should not come as a surprise. They know better than anyone else what is invaluable in nature and what can be reasonably exploited for economic ends.

In recent years the links between poverty and the environment have been a key concern of the UN Environment Programme (UNEP). The studies it has already completed demonstrate how important environmental factors are in the fight against poverty. If we fail to integrate ecosystem usage and protection in our poverty reduction strategies they will be doomed to failure.

Perhaps one dollar per person per day is not enough to cover all the costs of providing fresh air, water and food, education and medical care. But in places where food and water can already be obtained from the natural environment, and social cohesion prevails, people might actually feel richer on a dollar a day.

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Translated by Harry Forster.

to feature the rather complex mix of environment and poverty issues in a digestible format and through this maybe inspire and motivate people to take very much needed action.

Above all, we want to be visual, presenting as much as possible carto(graphic) and photo(graphic) materials, also from unexpected sources, such as postage stamps. It is in our opinion vital to communicate the environment beyond a narrow congregation of insiders, "the converted", and for this purpose we apply also unconventional tools. For

this, we have occasionally been called "environmental pornographers", a term that we initially disliked, but, that on the other hand may have some truth in it. We want people to get excited about environmental issues.

Another, maybe even more difficult ambition is to cross borders: of countries and regions (which under a United Nations label seems obvious) of scientific disciplines and schools and also ideologies. For that reason, we feature the work of pronounced "anti-mondialists" but also of "engines of

globalisation" on the same pages. For the same reason we have also included the groundbreaking work done by the Harvard School of Design on "Shopping", according to them "arguably the last remaining form of public activity" with obvious linkages to both poverty and the environment.

This for the form. Regarding the contents, we follow more conventional lines, with a red thread being the ecosystems, goods and services concept which is playing an important role in UNEP's work. With the "international

year of the freshwater" just passed, space is also dedicated to freshwater issues in line with the agenda items of the Jeju forum: freshwater, sanitation and human settlements. A policy page underlines the need for solutions and action.

Enjoy reading.

Special thanks to Bakary Kanté and the Division of Policy Development and Law of the United Nations Environment Programme and GRID-Arendal, who made this work possible.



German stamp 1985
Save the forest

Over the last three decades, the paths of government departments and international organisations concerned with the environment have converged with the paths of departments and agencies concerned with a more economically based development. This has expanded the definition and measurement of human well-being, and revealed new opportunities for human development, in particular poverty reduction, as detailed by Flavio Comim. Thierry de Oliveira and Anantha K. Duraipapp set out how UNEP is putting this new thinking into practice.

The role of ecosystems in provisioning (supplying food, fibre and fodder), regulating (purification, detoxification, mitigation of droughts and floods) and enriching (spiritual, aesthetic, social functions), can be seen as providing the raw materials, the enabling conditions, and the inspiration for development. John Vidal's report from Hitosa in Ethiopia illustrates some of the benefits that water supply can bring to poor communities – including opportunities for growing and

selling vegetables, and freedom from predation by hyenas.

To complement this expanded poverty-environment nexus, the nature of the relationship has also been reviewed. The long-standing assumption that poverty is a causal factor in environmental degradation has been re-examined, and evidence points to a much more complex nexus of social and economic exclusion as well as institutional failure as the main drivers of both environmental degradation and poverty. It is also well recognised that poor communities suffer most from environmental degradation and hazards, because of their increased level of direct dependence on natural resources. This is manifest through increased risk of disease, accidents, and disasters. In an urban context, these interactions are concentrated and the impacts magnified, as explained by David Satterthwaite. His article helps to dispel the urban myth that the poor have a greater environmental impact, and puts forward some integrated solutions for improving urban environments, societies, and economies.

Realising development

Thierry de Oliveira and Anantha K. Duraipapp

There is an increasing consensus that poverty is multi-dimensional. The income-dominated approach to poverty reduction has now widely been acknowledged among development experts as being limited in terms of impact and reach. On the whole, the income-oriented approach has recorded very limited success in reducing poverty. Furthermore, the assumption that benefits obtained from economic growth would reduce poverty by the so-called trickle down effect is coming under increasing criticism. Here we will argue that any poverty reduction schemes should be formulated within the boundaries of ecosystems and ecosystem services.

It is necessary to begin by adopting a fundamental philosophical shift that moves beyond income preoccupation and embraces the concept of opportunities, freedom to make choices and agency – the building blocks of Nobel Laureate Amartya Sen's Capability paradigm.

A second shift calls for an ecosystem approach which acknowledges the three main services – provisioning, regulating/supporting, enriching – ecosystems provide for human well-being. The ecosystem approach also recognizes that these services are highly inter-dependant and synergistic with each other. For example, over use of the provisioning service will cause deterioration in the supporting/regulating service.

We suggest a comprehensive framework that establishes the link between the capability paradigm with the ecosystem approach will be needed if we are to realistically reduce poverty and improve human well-being in a sustainable manner.

On human well-being and poverty

- How human well-being and poverty is expressed is context and situation dependent, reflecting local social and personal factors like geography, ecology, age, gender and culture.
- These local social and personal factors require that human well being be more than just income and opulence. It is multi-dimensional and should also include non-materialistic constitutive constituents like the ability to prevent avoidable diseases, to have access to clean water, the ability to live in a safe environment, the ability to have clean air, the ability to use clean energy for keeping warm and cooking, and the ability to use ecosystems for traditional spiritual practises.
- Human well being is therefore about the expansion of human capabilities – the ability to achieve what individuals have reason to value.
- Poverty is the pronounced deprivation of human well-being or in other words the pronounced deprivation of human capabilities.

On ecosystem services

- Ecosystems are highly diverse and complex systems.
- Ecosystems provide three critical services; regulating, provisioning, enriching.
- The three ecosystem services are highly inter-dependent and excessive extraction of one service leads to deteriorations in the other services.
- An ecosystem approach is needed whereby the natural synergies among the various services are re-

spected and management strategies designed that reinforce these inter-dependencies.

On the relationship between human well-being, poverty and ecosystem services

- Each of the four ecosystem services provides valuable constitutive elements of human well being. The ability for individuals to achieve the various constituents and determinants of well-being are directly influenced by their ability to access and use ecosystem services in a fair and equitable manner.
- The fact that various stakeholders use ecosystem services in various ways and that these stakeholders have different degrees of dependency on these services is critical. Some may have clear substitutes while others have limited options. This calls for ecosystem management strategies to be designed with respect to these variances outlined above, the types of use of ecosystem services and ensure that no stakeholder groups are marginalized in the process.
- There will be trade-offs to be made between ecosystem services as well as among the various constituents of well being.

On intervention strategies

- There is a need to move away from a one-size fits all approach to a complex adaptive management strategy that embraces, understands and respects the heterogeneity of ecosystems and people.
- The use of a policy framework that emphasizes not only economic opportunities, but an integrated framework that also includes social opportunities, participatory freedom, transparency and good governance, protective security in the form of social nets and finally ecological security.
- The adoption of an integrated policy framework that emphasizes not only the efficient use of ecosystem services but also equity and fairness.
- A combination of instruments (market and non-market), organizations (public, civil and private) and institutions (formal and informal) will be required in order to provide the working basis for the integrated policy framework.
- Policy coherence is a critical element if an integrated policy framework is to be successful in achieving the objective of poverty reduction through the sustainable management of ecosystems.

Development frameworks must ensure that the premises outlined above are captured in the implementation process. In determining how to achieve all the above, value judgments have to be made concerning equity and ecosystem stewardship. Such understanding and depth of knowledge will always be needed to inform and support responsible and far-sighted governance.

Thierry de Oliveira leads the Poverty-Environment Programme at UNEP within the Division of Policy Development and Law. Amongst other achievements, he was instrumental in designing the poverty-environment component of the NEPAD Environment Initiative. Anantha K. Duraipapp is a senior economist and director of the Economic Policy Programme at the International Institute for Sustainable Development, Canada. He is assisting UNEP with the Poverty-Environment programme and has published many papers.

Capabilities and poverty-environment links

Flavio Comim

Two notions about poverty-environment links are now widely shared by policy-makers, NGOs and academia: i) that world poverty reduction depends on proper ecosystem management to be achieved sustainably, and ii) that the links between ecosystems and human well-being are dynamic and complex since they depend on time-lags, geographical and temporal scales, cultures, institutions, traditions and many other particular features of local ecosystems and constituents of human well-being. However, although the complexity and multidimensionality of these links are widely acknowledged, the use of unidimensional and linear techniques (such as simple livelihood analysis and environmental impact assessments) remains quite entrenched among researchers and policy-makers. Yet, new initiatives such as UNEP's Poverty-Environment Initiative are revolutionising the way in which the complexity of poverty-environment links are being comprehensively and systematically assessed. A central feature of these initiatives is the use of a multidimensional approach to evaluate human well-being and ecosystem services focused on the promotion of autonomy of individuals and communities. These new developments match technical advancements, such as mapping aspects of human well-being and ecosystems.

These initiatives have been highly influenced by the development of Professor Amartya Sen's Capability Approach and its implications for the establishment of a human development perspective. This approach has been

used to assess well-being with emphasis on distributive considerations. The approach aims to determine which criteria should be used when making normative assessments. In the current context we could ask: what criteria should we use when we are assessing the impact of poverty on ecosystems or the impact of ecosystem changes on poverty?

Sympathisers of the Livelihoods Approach would claim that the main criteria to assess impact on human well-being should lie on the distribution of resources among different individuals or communities. They would emphasise rural portfolio management options and strategies to cope with vulnerability caused by the volatile returns of the poor's assets. This analysis will prove an important contribution, but, as Professor Sen has pointed out, resources are usually imperfect indicators of well-being. Because not all people are equal in their capacity to convert resources into well-being and not all of them live under the same cultural and social constraints, promotion of equality should be achieved in the space of capabilities. Different families or individuals might get the same resource allocation but might not have the same capability of converting these resources into whatever they have reasons to value.

The Livelihoods Approach has given a first step into the promotion of multidimensionality analyses of poverty-environment links. The Capability Approach furthers this logic by broadening the dimensions incorporated in the examination of these links. Information about resource distribution is not all that matters. Other informational spaces related to the constituents of human well-

being, such as health and education, are important here. Thus, the Capability Approach provides a rationale for the use of techniques and methodologies that take into account: i) multidimensional aspects of human well-being, ii) ethical considerations for assessing distributive issues in assessing human well-being, iii) the choice of environmental and poverty indicators that reflect the importance of assessing the quality of processes rather than simply outcomes of policies, iv) the use of participatory approaches to enhance the ownership and participation of local communities in the management of their natural resources, v) what people are actually able to be and to do (ends) rather than simply what resources (means) they have available to promote their well-being.

It is important to note that the added-value of the use of the Capability Approach lies not on a simple list of these points but on the general perspective that articulates all of them in a comprehensive and systematic way.

Poor people and the ecosystems where they live should be seen as part of the solution and not as part of the problem. The Capability Approach provides a rationale for articulating a wide range of information needed for the solution of entrenched poverty-environment problems. It does not provide a ready-made solution. It provides a way for us all to arrive at solutions.

Flavio Comim is the Director of the Capability and Sustainability Centre, St Edmund's College, University of Cambridge. The csc provides a forum for collaborative research and interdisciplinary discussion tackling human and sustainable development, and their links, from a capability perspective.

“There is no hunger where there is water”

John Vidal

When the ponds in the central Ethiopian village of Deyata Dodota ran dry for six months of the year, the women would set out at 4am on a long, back-breaking journey. The daily hardship of carrying water weighing up to 18kg over such a long distance – and the fear of hyena attacks along the way – together with the grinding poverty of subsistence farming in the region, have left a grim legacy. Today there are many in Deyata Dodota left crippled by years of water-carrying, and the village graveyard is full of women who died young, exhausted and diseased by poor water.

Deyata Dodota was transformed almost overnight in 1994 when the NGO WaterAid, backed by the Ethiopian government and an army of volunteers, laid 20 miles of pipe from the water source, and a further 68 miles of distribution lines. They also built three new reservoirs, capped several springs and installed 122 water points. It was a huge community effort, costing £1 million, but it now serves 70,000 people in the town of Iteya and 23 villages, including Deyata Dodota. The investment of about £13 per head has had astonishing physical, social and cultural results.

The women of Deyata Dodota unanimously say that they have been freed. “Woha hiwot newu (Water is life)” says Radia Aman. “The arrival of the

water has changed everything. All our lives have been greatly improved. We used to get diarrhoea and other diseases. At that time we could not clean the dead, our children would be dying for food while we were collecting water and you can imagine the change it has made for nursing mothers” she says.

The nearby town of Iteya has changed beyond recognition. “No one wanted to live here eight years ago because we had no water, and the town was very poor” says Haji Gebi, chair of the community water management board. Iteya has doubled in size since the water arrived, there are trees growing in the streets and real prosperity in the cafes and agricultural shops. Last year the first two-storey building was constructed. “Now people and businesses and money are coming. A school has been built and our children are healthy. Children go to school who never would before. This is like a new town. It is because the water has stimulated business, farming and social life” says Gebi. “People now grow vegetables in their gardens so their diet is better. There is no hunger where there is water” he says.

But WaterAid's work has had other unexpected benefits. Technical, managerial, health, hygiene and financial jobs have been created, and new skills have been learned. And because the whole scheme is run by and for the commu-

nity as an independent non-profit-making project, it has given people a sense of shared ownership.

The 23 villages and the town elect a board, which annually decides the price the water should be sold at, where services should be extended, and where the money taken in charges, should be invested. They also train and employ technicians to manage the pipes, and community workers to oversee all 122 water points and advise everyone using the taps about sanitation, hygiene and general health. “The rich pay more and subsidise the poor. We have £8,000 in the bank, some of which is going to take water direct to the school, and we are hoping to help build the new health clinic. We have loaned money for the construction of a church and a high school, and paid for the water to go to the school. This is development” says Getu Bedo, also on the board.

“With water, everything is possible” says Meselech Seyoum who works with WaterAid. “But people have to contribute; we cannot just impose solutions on people. We try to find the solutions with people. That is what is unique.”

John Vidal has been a journalist at the Guardian newspaper in the UK for 14 years, and the newspaper's Environmental Editor for the past eight years. He has four times won Environmental Journalist of the Year in the UK and in 1999 he was awarded the World Food Prize for writing. He also writes for BBC Nature magazine. This article is reprinted with permission from The Guardian, 14th April 2003.



Jersey stamp 1979
Pink pigeons

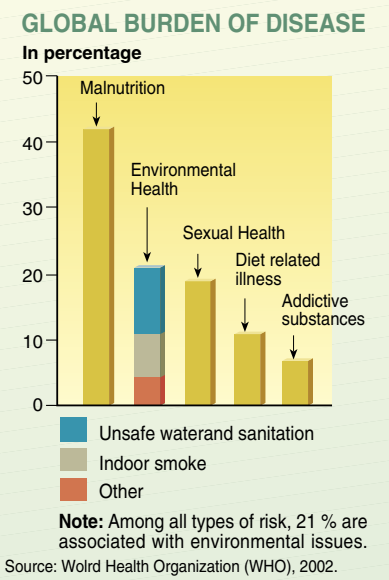
Poor countries and poor people carry a disproportionately large part of the global burden of ill health. On average one-fifth of this burden is attributable to environmental factors, but the environmental contribution in poor countries is ten times higher than in rich countries.

A healthy population is necessary for poverty reduction and economic development, and investments in health have proven to be cost efficient. Although the links between a healthy environment and a healthy population are gaining recognition and attracting investigation (for examples read the full Linking Health and Environment report advertised below), these have rarely been quantified. Here we give a graphical representation of one commonly-recognised causal relationship – that between inadequate sanitation and cholera, and one complex synergistic relationship, which is only recently gaining momentum – that of HIV/AIDS and the environment.

Also in this section, John Roberts makes the case for an integrated financial accounting system to illustrate to policy makers that investing in the environment gives financial returns in the

health sector, which in turn leads to greater economic activity and growth.

The poor carry a larger burden of environment-related disease due to their more direct dependence on natural resources, greater vulnerability to environmental hazards, inadequate access to affordable health care, and often greater vulnerability to climate change. However, as our understanding of these relationships expands, so do the possibilities for meeting the multiple goals of eradicating poverty and hunger, reducing child mortality, improving maternal health, combating AIDS, malaria and other diseases, and ensuring environmental sustainability, through an integrated, holistic approach. What is required is a health development programme that targets the poor and helps them to create and maintain a healthy environment, whilst providing support through greater access to health services, which include hygiene promotion, traditional healing, and accident prevention.



Accounting for good health?

John L. Roberts

Mrs Beeton's celebrated Victorian tome on Household Management stands as one of the all time top selling management books. We have much to learn from her today. Every one of her thousands of recipes was costed. And she provided technical specifications for the different staff and equipment required to do the job, how to select them, comments on labour market problems and the options of in-house production and outsourcing, as well as guidance on the process of service delivery.

Compare that with recent international reviews of environmental management and you are in for a shock. They claim to be aids for decision-making. They say that environmental and social costs and gains are factored into policy measures, regulatory frameworks and planning processes. But the guides to environmental policy typically avoid such practical issues as costs and cost-effectiveness. This contrasts starkly with the modern field of public health management, landmarked by the World Development Report of 1993, in which the World Bank analysts presented, in the Beeton way, a series of costed recipes for providing an essential package for primary health. For \$12 a head you could have safe water and sanitation, plus essential primary care. The package included the measure of health gains to be achieved from the interventions.

The World Bank's work from its inception became a basic tool for health planners. A best seller and a best buy. It helped to bridge the gaps between the quantification of health problems, the gains to be achieved and the resources required. It addressed political issues of priorities in a very practical way.

Now the World Health Organisation has gone one step further. It hired Jeffrey Sachs. His job was to extend

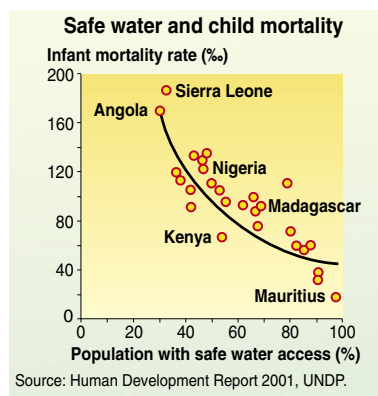
the analysis and calculate the cost of reaching the Millennium Development Goals for health. No small task, and his work has eclipsed Mrs Beeton and the World Bank. Sachs and his colleagues, working with WHO, have surveyed the best evidence on intervention for the biggest health problems in the world; they have identified the most cost-effective interventions, examined the size of the health problems in the different regions of the globe, and provided the best estimates of the sums required to resolve those problems and the expected results to be achieved. Sachs then compares the sums required with the levels of existing expenditure in different parts of the world and produces a series of figures for the investment required for achieving better health.

For busy policy makers forced to choose between saving the pink pigeon and reducing infant mortality, there is already a bias for babies. But when the prices and expected results are also presented, the pigeon fancier may be left out in the cold.

In truth there is plenty of economic theory and useful frameworks for environmental accounting for not just the value of the environment, and the cost of its degradation, but also for pricing the investments required for effective sustainable intervention and providing estimates of the likely yield. To make sense of Agenda 21, the Millennium Development Goals and WSSD we need the missing prices and measures of impacts of the necessary investments; not just ticks on lists of treaties agreed and implemented in terms of local legislation. We need to see the bottom line in terms of changes in resource allocation.

The policy makers also need to have a catalogue of costs.

"So we want to save our coast-line from erosion; what does that cost per kilometre



saved and what results can we expect in terms of ecological gains? And on my desk tomorrow the list of approved contractors who can do the job.

Wait a minute! A briefing at the same time on what it will cost to reduce pollution in our depleted fishing zones and what yield will we get from increased catch size? Will we save anything on health costs from having lower levels of contaminants in fish and seafood?

By the way, set out the capital costs and the recurrent costs separately. All by close of play today. Right!"

In bridging the gap between environmental and health economics, let's take the water crisis: The Centre for Environment and Development in the Arab Region and Europe tells us that "every 8 seconds a child dies from a water related disease; 80% of diseases in the developing world are caused by contaminated water ... the absolute minimum that the world community must provide to the world's poor without water, are: low cost technologies such as hand pumps, gravity-feed systems and rain-water collection."

If we look at the relationship between safe water supply and infant mortality, derived from the 2003 UNDP Human

Relative cost and value of health measures in parts of Africa Estimated cost-effectiveness of proposed interventions in African countries with high adult and child mortality			
Intervention Source: WHO (2002)	Cost IS Millions	Estimated DALYs Saved Millions	Cost per DALY Saved IS
Water disinfection at local level	600	3.1	194
ARV (first line drugs)	600	0.8	750
Iron supplements (95% coverage of pregnant women)	100	1.1	91

Development Report (see figure), the health gain is evident although diminishing at each level of increased proportion of the population with safe water. This big picture is also well documented by WHO. It reckons that to bring safe water and safe sanitation to 98% of people living in countries in African and Eastern Mediterranean regions, with high adult and infant mortality, would cost \$486 billion (the prices are in international dollars which take account of variations in purchasing power). This would reduce mortality and disability, especially from diarrhoeal infections, to the extent of saving 583 million Disability Adjusted Life Years (DALYs are a measure that combines, in one index, loss of life with years lived with disability). In addition, the interventions would save on average 88 hours of time per person per year. Thus there is a cost of \$834 per DALY saved, plus the time savings for all individuals benefiting from the measures. All the environmentalists need to do is to add the environmental savings to complete the picture.

To stimulate further thinking on the relative value of environmental interventions to help in assessing priorities, the table above shows some figures derived from further technical estimates from WHO revealing the relative cost-effectiveness in poor parts of

Africa of iron supplements for pregnant women, water disinfection, and ARV treatment in cases of HIV/AIDS.

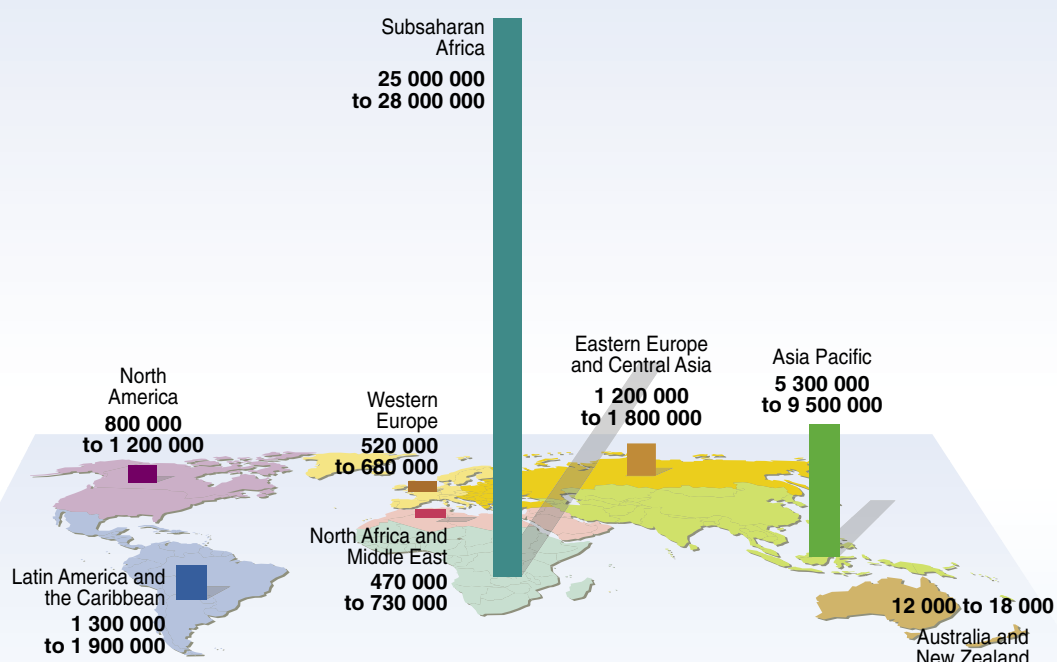
If only environmental policy makers had material like this in a Beeton-style manual together with the technology requirements, the contractors on the approved lists and the estimated prices, set out in tables for reducing soil erosion, saving rain forests, cleaning up the world's rivers and lakes, putting the fish back in the sea in numbers; even for saving the pink pigeon. Come in Jeffrey Sachs, here's the next assignment!

Just as environmentalists could take a leaf from Mrs Beeton's book, to be true, we would rather expect her to include nutritional values in a modern edition.

Dr John L. Roberts is an international consultant on economics and health policy. He is a consultant to UNEP in the Africa Environment Outlook process and publication series.

- Sachs J (2001). *Macroeconomics and health*; investing in health for economic development, WHO, Geneva
- CEADRE 1999, *The Water Crisis*, CEADRE Chronicle, March p 7.
- UNDP 2003, *Human Development Report*, OUP.
- WHO (2002) *World Health report, some strategies to reduce risk*; improved water supply and sanitation p. 128
- WHO (2002) op.cit. p. 130-136

NUMBER OF HIV POSITIVE PERSONS IN THE WORLD, ESTIMATES DECEMBER 2003:
34 000 000 TO 46 000 000



HIV/AIDS and the environment

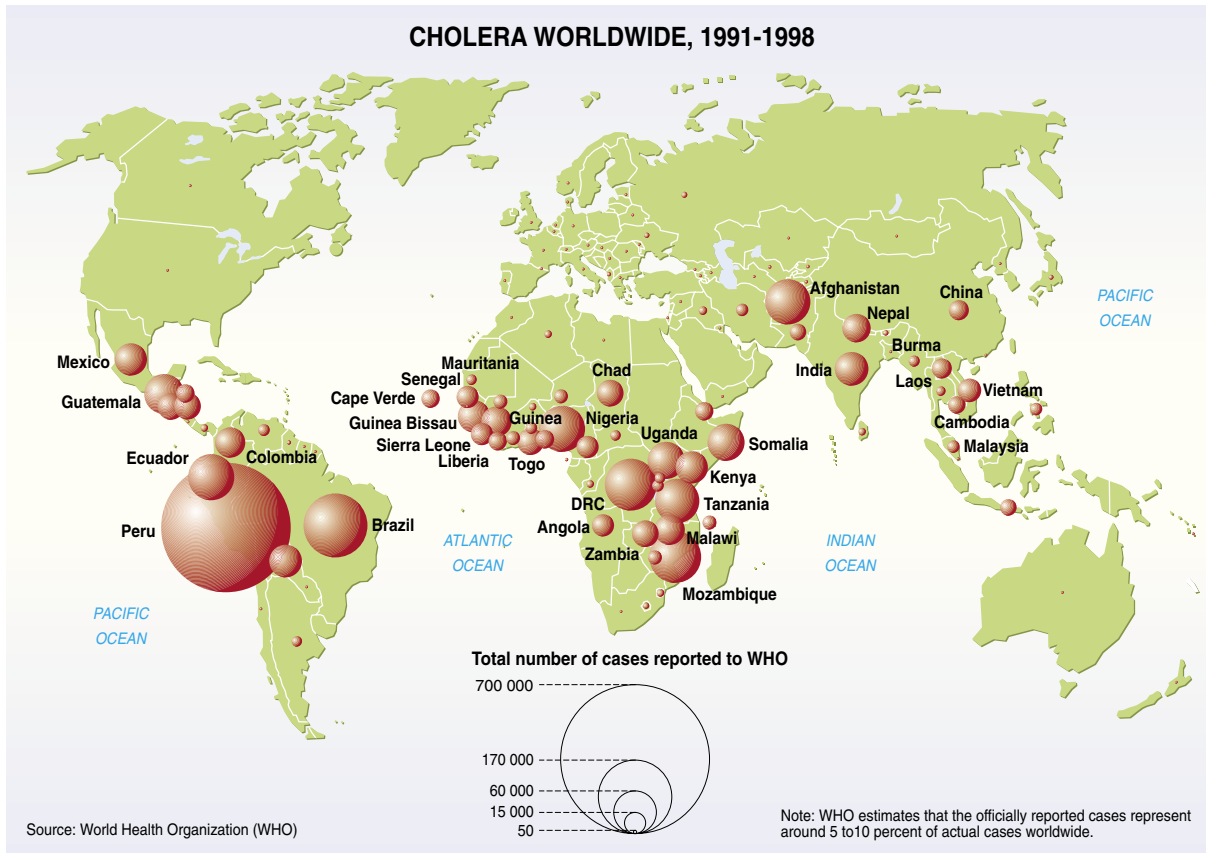
The impacts of HIV/AIDS on the environment are becoming more prominent among the longer-standing socio-economic analyses. For example, food security may be threatened as reductions in the labour force may reduce agricultural productivity, whilst poor nutrition renders people more susceptible to HIV infection.

The Africa Biodiversity Collaborative Group² envisages additional impacts, including over-use of natural resources such as medicinal plants, timber for coffins, and wildlife for food; loss of traditional knowledge of sustainable land and resource management practices; and loss of human capacity for natural resource management in government, non-governmental organisations, academic institutions, communities, donor organisations, and the private sector.

However, according to the group, just as the environment may be impacted, it may also offer solutions. For example, medicinal plants may be used

to treat infections and diseases in AIDS patients, and may be marketed commercially to provide additional incomes to rural communities where the labour force has been impacted, and agricultural diversity may be increased to improve food security. This will require a shift in governance and management of natural resources, and greater integration between the health sector, the pharmaceutical industry, and natural resources-based community groups. Traditional knowledge of medicinal plants and agricultural and conservation practices should be documented, and policies should be developed in partnerships using this knowledge.

- IFPRI 2004. *The Impact of AIDS on Food Security to 2020*. www.ifpri.org
- HIV/AIDS and Natural Resource Management Linkages workshop proceedings. 26th and 27th September 2002 Nairobi, Kenya. Organized by the Africa Biodiversity Collaborative Group, Hosted by WWF-EARPO, and Facilitated by the College of African Wildlife Management, Tanzania



Swiss stamp 1962
Fight against malaria



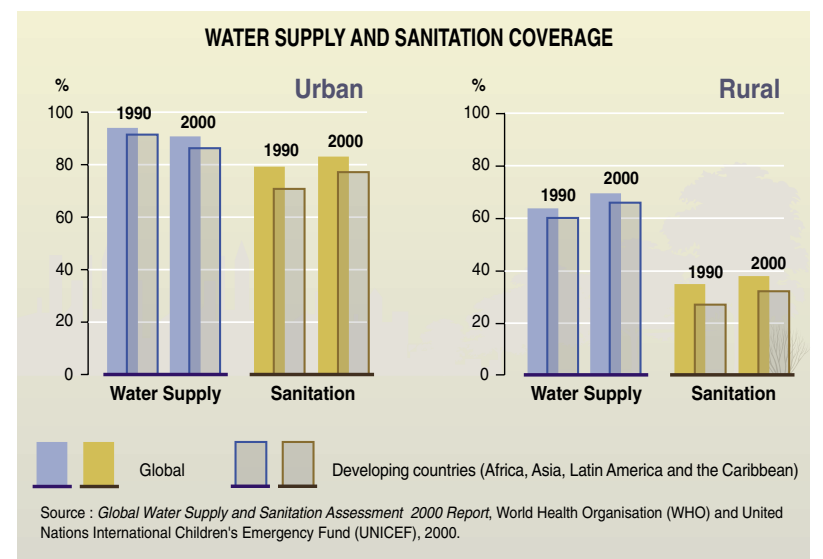
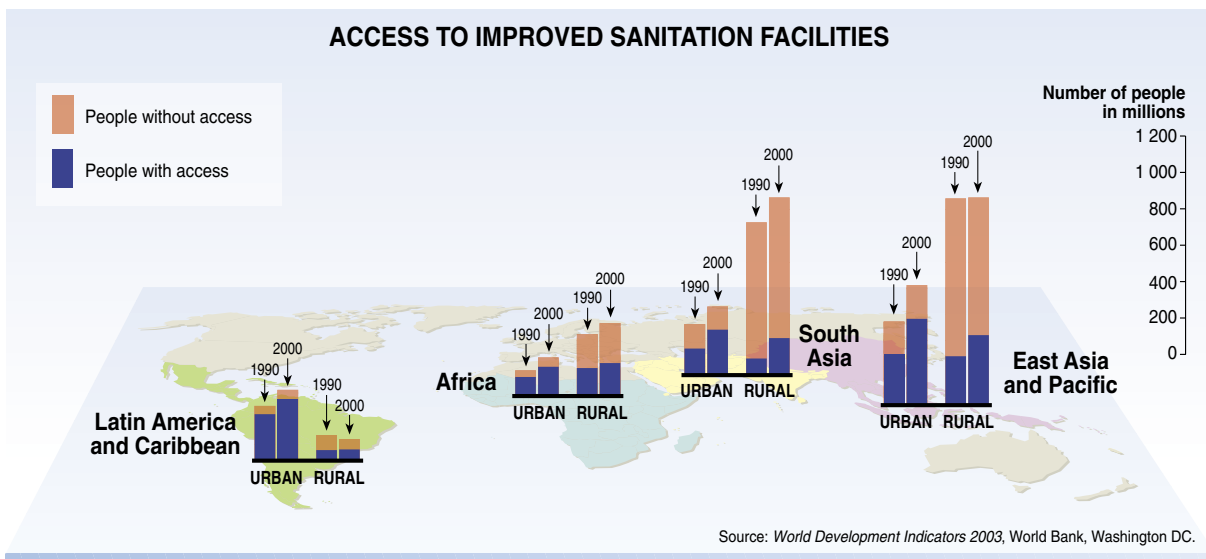
Monaco stamp 1962
Fight against malaria

Cholera and sanitation

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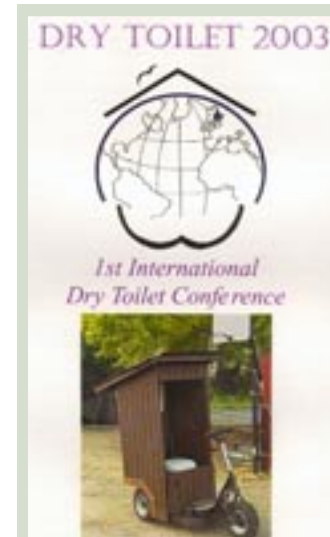
Progress in sanitation coverage and safe drinking water supply has been extremely slow, leaving the Millennium Development targets a distant vision. If the rates of the 1990s persist, in rural areas of developing countries, the entire population will finally have access to safe drinking water only in 2070, and the sanitation coverage will be completed only in 2130.



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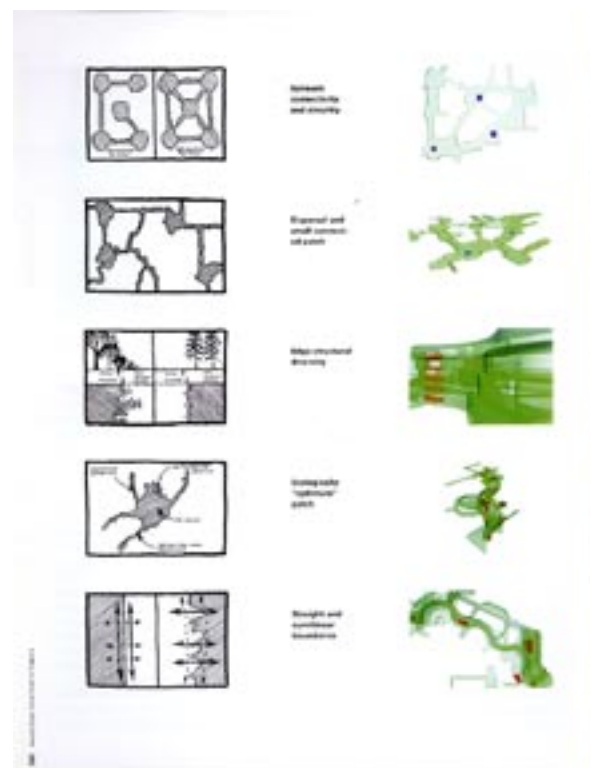
www.halfbakery.com/idea/Dry_20Toilet www.drytoilet.org/Finalreport.pdf



Russian stamp 1993
AIDS campaign



Italian stamp 1989
Fight against AIDS



PROJECT ON THE CITY 2
edited by chuihua judy chung, jeffrey inaba, rem koolhaas, sze tsung leong

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German stamp 1973
Environmental protection



German stamp 1973
Environmental protection



German stamp 1973
Environmental protection



German stamp 1973
Environmental protection

Development in an urban context

David Satterthwaite

By 2000, approximately two-fifths of Africa's and Asia's population and three-quarters of Latin America's population were living in urban areas¹. These regions are home to most of the world's largest and fastest-growing cities, where the number of people living in poverty is also rapidly increasing.

Urban areas concentrate a wide range of social and environmental problems. More than 600 million urban dwellers live in squatter settlements or illegal subdivisions where the housing is makeshift, or in tenements or cheap boarding houses^{2,3}. Their lives and health are continually threatened because of poor quality, overcrowded housing (often one household per room), and inadequate provision of safe water supplies, sanitation, drainage, and garbage collection^{4,5}.

It is often assumed that urban poverty is a major cause of environmental degradation^{6,7}. However, most environmental degradation in urban areas is caused by consumption patterns of high-income groups and the production and distribution systems that serve them. Ironically, high levels of urban poverty in Africa, Asia, and Latin America have helped to keep down environmental degradation,

because poor urban dwellers have very low levels of consumption, resource use, and waste generation. Indeed, the urban poor generally have a positive role from an ecological perspective, as they use so few resources and are the main re-claimers, re-users, and recyclers of wastes from industries, workshops, and wealthier households.

The urban environment

A better understanding of the links between poverty and the environment in urban areas is needed to improve the design and implementation of urban development projects. The first step is to recognise the multiple deprivations that contribute to urban poverty. These include not only inadequate income but also inadequate shelter, public infrastructure and limited or no safety net. Poverty is also caused by the contraction of rights of low-income groups, and their powerlessness within political systems and bureaucratic structures. Equally important is not to confuse environmental hazards and environmental degradation. Most of the urban poor face very serious environmental hazards in their homes and their surroundings and in their workplaces⁸. Such hazards cause ill health, injury, and premature death, contributing significantly to urban poverty. However, most environmental hazards do not

cause environmental degradation. For instance, the inadequacies in provision for piped water, sanitation and drainage often means serious problems with insect borne diseases such as malaria and dengue fever but these do not degrade any environmental resource. The small makeshift homes in which so many urban poor live make accidents a common cause of serious injury or premature death, and present serious environmental hazards but do not cause environmental degradation.

Other dimensions of the poverty-environment nexus in urban areas include:

- *Water-related diseases* – at any one time, close to half of the urban population is suffering from one or more of the main diseases associated with inadequate provision of water and sanitation⁹.
- *Occupational exposure to a wide range of chemical pollutants from the industrial, energy and transport sectors* – more than 1.5 billion urban dwellers are exposed to levels of ambient air pollution above the recommended maximum levels, and this causes an estimated 400,000 additional deaths each year⁹.
- *Deaths and injuries from motor vehicle accidents* – these have become an increasingly significant component of

all premature deaths and injuries in many cities, especially those where infectious and parasitic diseases and their underlying causes have been successfully addressed.

- *Vulnerability to natural disasters* – cyclones, high winds, and storms – has probably caused more deaths in urban areas than other disasters in recent decades. Earthquakes have caused many of the biggest urban disasters. Floods affect many more people than cyclones and earthquakes but kill fewer people. Landslides, fires, epidemics, and industrial accidents are among the other urban disasters that need attention.

The economic underpinning of the environmental risks becomes evident when comparing the risks faced by lower-income and higher-income groups. Most case studies on infectious and parasitic diseases and morbidity and mortality show that these mostly affect low-income groups¹⁰. The same is true for most chemical pollutants and physical hazards¹¹. Higher-income groups have better-quality homes and generally less dangerous jobs and work in occupations where occupational hazards are minimised.

The urban solution

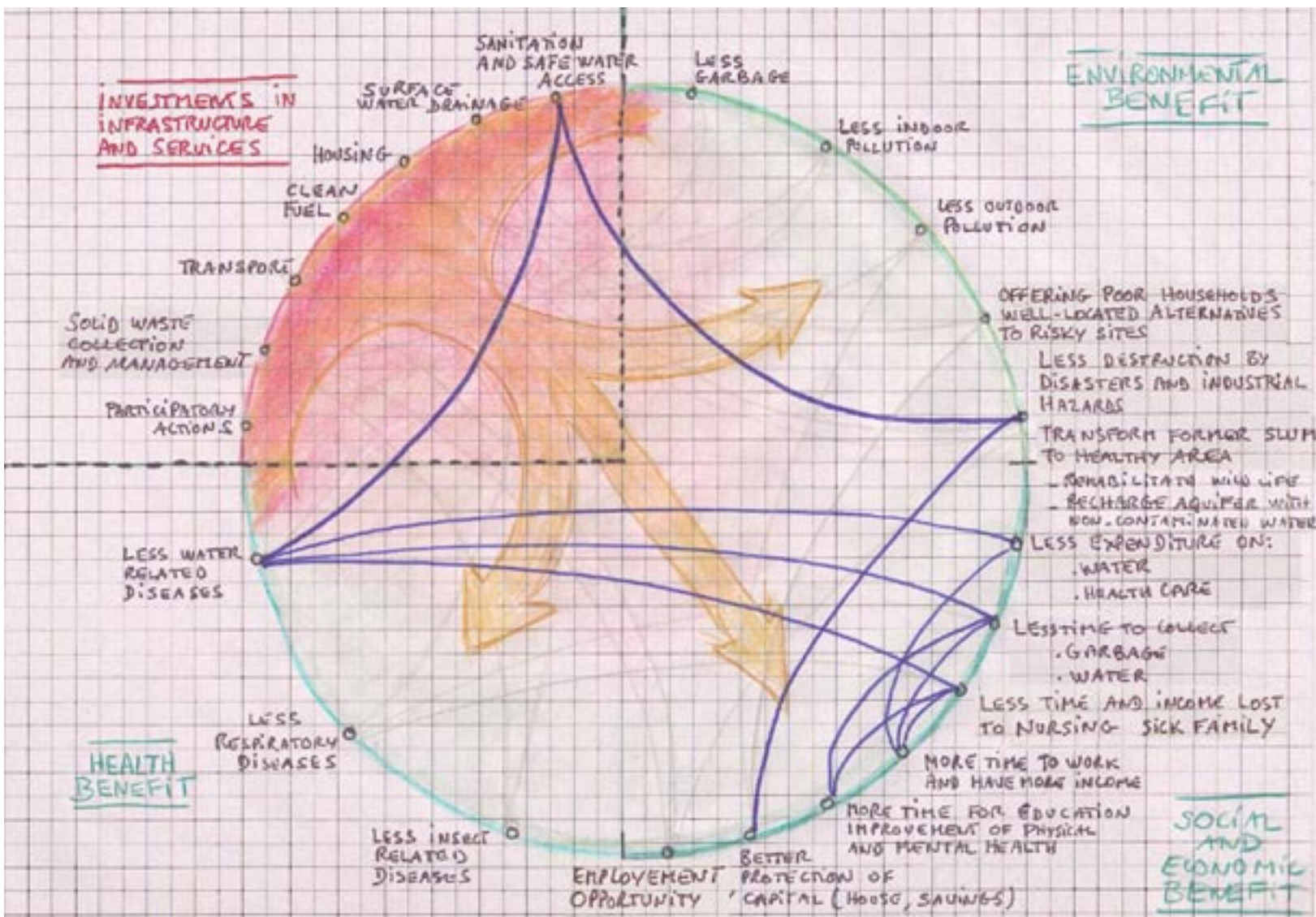
Urban planners and development

agencies can help address urban poverty through various environmental actions, as shown below;

More effective links between poverty reduction and environmental management depend on accountable, effective, and innovative urban authorities. Priorities include ensuring provision for basic services for the poor and making land available for housing that does not damage surrounding ecosystems. Also management of consumption and waste generation and disposal in higher income areas. International agencies can support this by going beyond more projects to strengthening the capacity of urban authorities to work with urban poor groups and develop appropriate responses.

National frameworks are also needed to encourage environmental policies that not only address urban environmental health problems, but also limit the transfer of environmental costs to people and ecosystems beyond urban boundaries.

David Satterthwaite is a senior fellow at the International Institute for Environment and Development in London, where he has worked since 1974. Trained as a development planner, he also has a doctorate in social policy from the London School of Economics. This article is a summary of a longer paper published in the *Annals of the American Academy of Political and Social Science* Vol 590 Annals 73, November 2003.



1. United Nations. 2002. *World urbanization prospects: The 2001 revision: Data tables and highlights*. ESA/P/WP/173. New York: Population Division, Department of Economic and Social Affairs, United Nations Secretariat.
2. Hardoy, Jorge E., and David Satterthwaite. 1989. *Squatter citizen: Life in the urban Third World*. London: Earthscan.
3. United Nations Centre for Human Settlements (UNCHS) (Habitat). 1996. *An urbanizing world: Global report on human settlements, 1996*. Oxford, UK: Oxford University Press.
4. Cairncross, Sandy, Jorge E. Hardoy, and David Satterthwaite. 1990. *The urban context*. In *The poor die young: Housing and health in Third World cities*, edited by Jorge E. Hardoy, Sandy Cairncross, and David Satterthwaite, 1-24. London: Earthscan.
5. World Health Organization (WHO). 1992. *Our planet, our health*. Report of the WHO Commission on Health and Environment. Geneva: World Health Organization.
6. World Commission on Environment and Development. 1987. *Our common future*. Oxford, UK: Oxford University Press.
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8. Cointreau, Sandra. 1982. *Environmental management of urban solid waste in developing countries*. Urban Development technical paper no. 5. Washington, DC: World Bank.
9. WHO. 1999. *Creating healthy cities in the 21st century*. In *The Earthscan reader on sustainable cities*, edited by David Satterthwaite. London: Earthscan.
10. Bradley, David, Carolyn Stephens, Sandy Cairncross, and Trudy Harpham. 1991. *A review of environmental health impacts in developing country cities*. Urban Management Program discussion paper no. 6. World Bank, UNDP, and UN (Habitat), Washington, DC.
11. Hardoy, Jorge E., Diana Mitlin, and David Satterthwaite. 2001. *Environmental problems in cities of Africa, Asia and Latin America*. London: Earthscan.



The Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment (MA) was established as an international process designed to meet the needs of decision-makers and the public for scientific information concerning the consequences of ecosystem change for human well-being, and to analyse options available to enhance the conservation of ecosystems and their contributions to meeting human needs. Leading scientists from more than 100 nations are conducting the assessment at multiple scales from global to local, with oversight by a Board comprised of representatives of international conventions, UN agencies, scientific organisations, and leaders from the private sector, civil society, and indigenous groups. The MA's first report, *Ecosystems and Human Well-being* was released in September 2003. The report lays out the approaches, assumptions, processes, and parameters scientists are using in the study. It offers decision-makers a mechanism to identify options that can better achieve core human development and sustainability goals and better understand the trade-offs in decisions about development and the environment.

Further information available on: www.millenniumassessment.org



Swedish stamp 1963
Feed the starving



Jersey stamp 1979
Pink pigeons

Poor countries and poor people carry a disproportionately large part of the global burden of ill health. On average one-fifth of this burden is attributable to environmental factors, but the environmental contribution in poor countries is ten times higher than in rich countries.

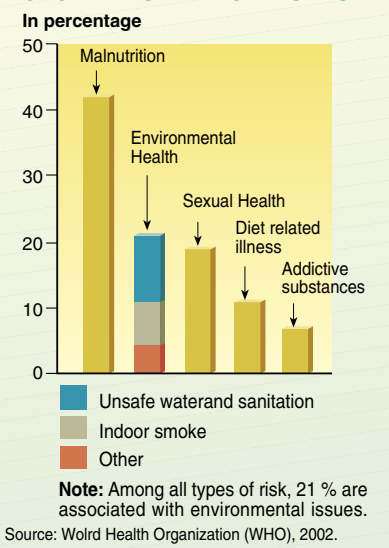
A healthy population is necessary for poverty reduction and economic development, and investments in health have proven to be cost efficient. Although the links between a healthy environment and a healthy population are gaining recognition and attracting investigation (for examples read the full Linking Health and Environment report advertised below), these have rarely been quantified. Here we give a graphical representation of one commonly-recognised causal relationship – that between inadequate sanitation and cholera, and one complex synergistic relationship, which is only recently gaining momentum – that of HIV/AIDS and the environment.

Also in this section, John Roberts makes the case for an integrated financial accounting system to illustrate to policy makers that investing in the environment gives financial returns in the

health sector, which in turn leads to greater economic activity and growth.

The poor carry a larger burden of environment-related disease due to their more direct dependence on natural resources, greater vulnerability to environmental hazards, inadequate access to affordable health care, and often greater vulnerability to climate change. However, as our understanding of these relationships expands, so do the possibilities for meeting the multiple goals of eradicating poverty and hunger, reducing child mortality, improving maternal health, combating AIDS, malaria and other diseases, and ensuring environmental sustainability, through an integrated, holistic approach. What is required is a health development programme that targets the poor and helps them to create and maintain a healthy environment, whilst providing support through greater access to health services, which include hygiene promotion, traditional healing, and accident prevention.

GLOBAL BURDEN OF DISEASE



Accounting for good health?

John L. Roberts

Mrs Beeton's celebrated Victorian tome on Household Management stands as one of the all time top selling management books. We have much to learn from her today. Every one of her thousands of recipes was costed. And she provided technical specifications for the different staff and equipment required to do the job, how to select them, comments on labour market problems and the options of in-house production and outsourcing, as well as guidance on the process of service delivery.

Compare that with recent international reviews of environmental management and you are in for a shock. They claim to be aids for decision-making. They say that environmental and social costs and gains are factored into policy measures, regulatory frameworks and planning processes. But the guides to environmental policy typically avoid such practical issues as costs and cost-effectiveness. This contrasts starkly with the modern field of public health management, landmarked by the World Development Report of 1993, in which the World Bank analysts presented, in the Beeton way, a series of costed recipes for providing an essential package for primary health. For \$12 a head you could have safe water and sanitation, plus essential primary care. The package included the measure of health gains to be achieved from the interventions.

The World Bank's work from its inception became a basic tool for health planners. A best seller and a best buy. It helped to bridge the gaps between the quantification of health problems, the gains to be achieved and the resources required. It addressed political issues of priorities in a very practical way.

Now the World Health Organisation has gone one step further. It hired Jeffrey Sachs. His job was to extend

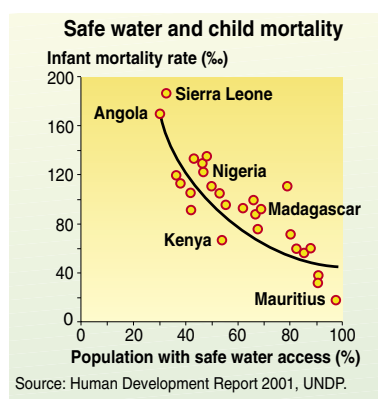
the analysis and calculate the cost of reaching the Millennium Development Goals for health. No small task, and his work has eclipsed Mrs Beeton and the World Bank. Sachs and his colleagues, working with WHO, have surveyed the best evidence on intervention for the biggest health problems in the world; they have identified the most cost-effective interventions, examined the size of the health problems in the different regions of the globe, and provided the best estimates of the sums required to resolve those problems and the expected results to be achieved. Sachs then compares the sums required with the levels of existing expenditure in different parts of the world and produces a series of figures for the investment required for achieving better health.

For busy policy makers forced to choose between saving the pink pigeon and reducing infant mortality, there is already a bias for babies. But when the prices and expected results are also presented, the pigeon fancier may be left out in the cold.

In truth there is plenty of economic theory and useful frameworks for environmental accounting for not just the value of the environment, and the cost of its degradation, but also for pricing the investments required for effective sustainable intervention and providing estimates of the likely yield. To make sense of Agenda 21, the Millennium Development Goals and WSSD we need the missing prices and measures of impacts of the necessary investments; not just ticks on lists of treaties agreed and implemented in terms of local legislation. We need to see the bottom line in terms of changes in resource allocation.

The policy makers also need to have a catalogue of costs.

"So we want to save our coast-line from erosion; what does that cost per kilometre



saved and what results can we expect in terms of ecological gains? And on my desk tomorrow the list of approved contractors who can do the job.

Wait a minute! A briefing at the same time on what it will cost to reduce pollution in our depleted fishing zones and what yield will we get from increased catch size? Will we save anything on health costs from having lower levels of contaminants in fish and seafood?

By the way, set out the capital costs and the recurrent costs separately. All by close of play today. Right!"

In bridging the gap between environmental and health economics, let's take the water crisis: The Centre for Environment and Development in the Arab Region and Europe tells us that "every 8 seconds a child dies from a water related disease; 80% of diseases in the developing world are caused by contaminated water ... the absolute minimum that the world community must provide to the world's poor without water, are: low cost technologies such as hand pumps, gravity-feed systems and rain-water collection."

If we look at the relationship between safe water supply and infant mortality, derived from the 2003 UNDP Human

Intervention <small>Source: WHO (2002)</small>	Cost <small>IS Millions</small>	Estimated DALYs Saved <small>Millions</small>	Cost per DALY Saved <small>IS</small>
Water disinfection at local level	600	3.1	194
ARV (first line drugs)	600	0.8	750
Iron supplements (95% coverage of pregnant women)	100	1.1	91

Development Report (see figure), the health gain is evident although diminishing at each level of increased proportion of the population with safe water. This big picture is also well documented by WHO. It reckons that to bring safe water and safe sanitation to 98% of people living in countries in African and Eastern Mediterranean regions, with high adult and infant mortality, would cost \$486 billion (the prices are in international dollars which take account of variations in purchasing power). This would reduce mortality and disability, especially from diarrhoeal infections, to the extent of saving 583 million Disability Adjusted Life Years (DALYs are a measure that combines, in one index, loss of life with years lived with disability). In addition, the interventions would save on average 88 hours of time per person per year. Thus there is a cost of \$834 per DALY saved, plus the time savings for all individuals benefiting from the measures. All the environmentalists need to do is to add the environmental savings to complete the picture.

To stimulate further thinking on the relative value of environmental interventions to help in assessing priorities, the table above shows some figures derived from further technical estimates from WHO revealing the relative cost-effectiveness in poor parts of

Africa of iron supplements for pregnant women, water disinfection, and ARV treatment in cases of HIV/AIDS.

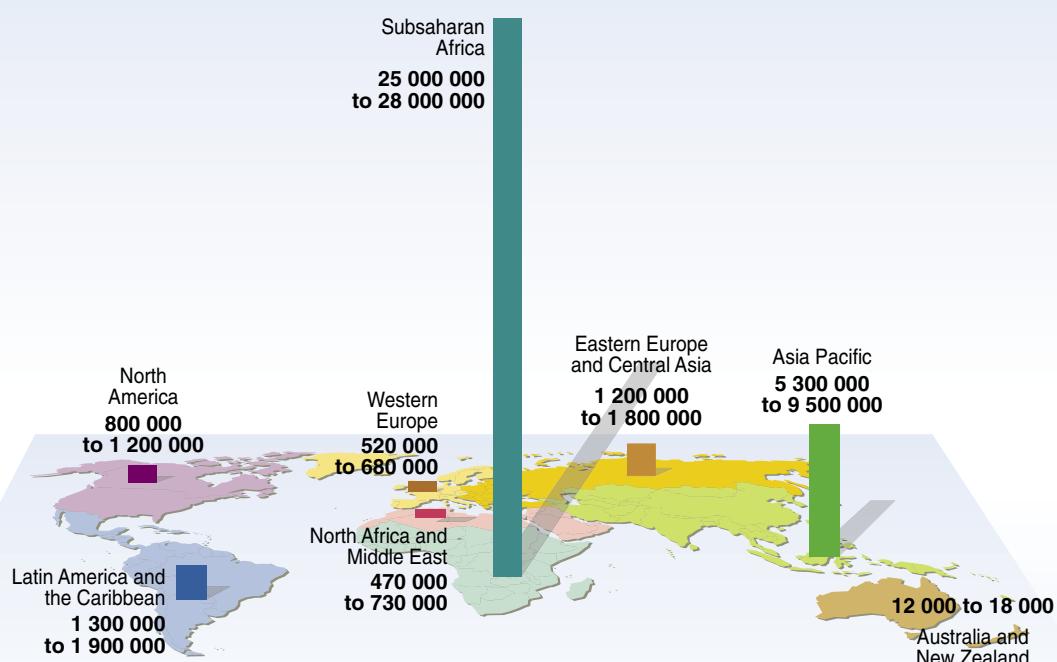
If only environmental policy makers had material like this in a Beeton-style manual together with the technology requirements, the contractors on the approved lists and the estimated prices, set out in tables for reducing soil erosion, saving rain forests, cleaning up the world's rivers and lakes, putting the fish back in the sea in numbers; even for saving the pink pigeon. Come in Jeffrey Sachs, here's the next assignment!

Just as environmentalists could take a leaf from Mrs Beeton's book, to be true, we would rather expect her to include nutritional values in a modern edition.

Dr John L. Roberts is an international consultant on economics and health policy. He is a consultant to UNEP in the Africa Environment Outlook process and publication series.

- Sachs J (2001). *Macroeconomics and health*; investing in health for economic development, WHO, Geneva
- CEADRE 1999, *The Water Crisis*, CEADRE Chronicle, March p 7.
- UNDP 2003, *Human Development Report*, OUP.
- WHO (2002) *World Health report, some strategies to reduce risk*; improved water supply and sanitation p. 128
- WHO (2002) op.cit. p. 130-136

NUMBER OF HIV POSITIVE PERSONS IN THE WORLD, ESTIMATES DECEMBER 2003: 34 000 000 TO 46 000 000



HIV/AIDS and the environment

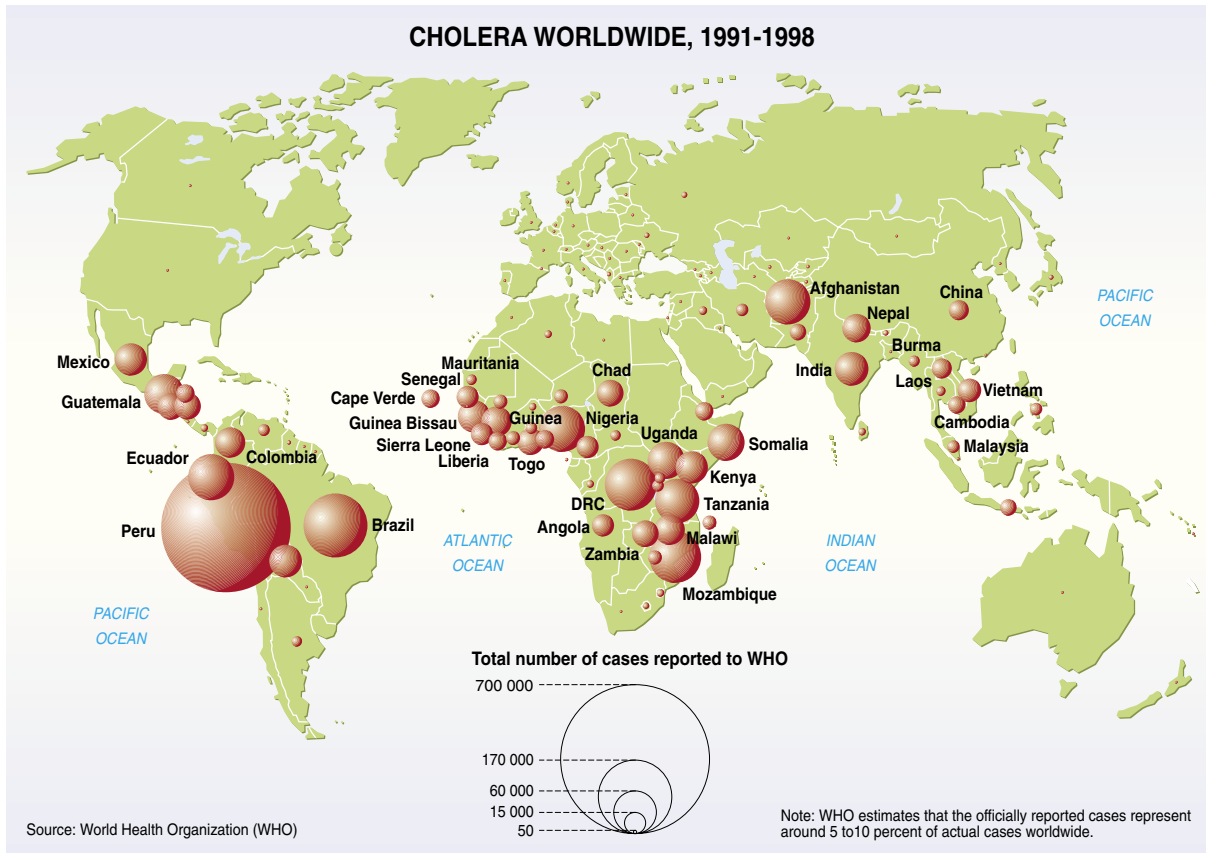
The impacts of HIV/AIDS on the environment are becoming more prominent among the longer-standing socio-economic analyses. For example, food security may be threatened as reductions in the labour force may reduce agricultural productivity, whilst poor nutrition renders people more susceptible to HIV infection.

The Africa Biodiversity Collaborative Group² envisages additional impacts, including over-use of natural resources such as medicinal plants, timber for coffins, and wildlife for food; loss of traditional knowledge of sustainable land and resource management practices; and loss of human capacity for natural resource management in government, non-governmental organisations, academic institutions, communities, donor organisations, and the private sector.

However, according to the group, just as the environment may be impacted, it may also offer solutions. For example, medicinal plants may be used

to treat infections and diseases in AIDS patients, and may be marketed commercially to provide additional incomes to rural communities where the labour force has been impacted, and agricultural diversity may be increased to improve food security. This will require a shift in governance and management of natural resources, and greater integration between the health sector, the pharmaceutical industry, and natural resources-based community groups. Traditional knowledge of medicinal plants and agricultural and conservation practices should be documented, and policies should be developed in partnerships using this knowledge.

- IFPRI 2004. *The Impact of AIDS on Food Security to 2020*. www.ifpri.org
- HIV/AIDS and Natural Resource Management Linkages workshop proceedings. 26th and 27th September 2002 Nairobi, Kenya. Organized by the Africa Biodiversity Collaborative Group, Hosted by WWF-EARPO, and Facilitated by the College of African Wildlife Management, Tanzania



Swiss stamp 1962
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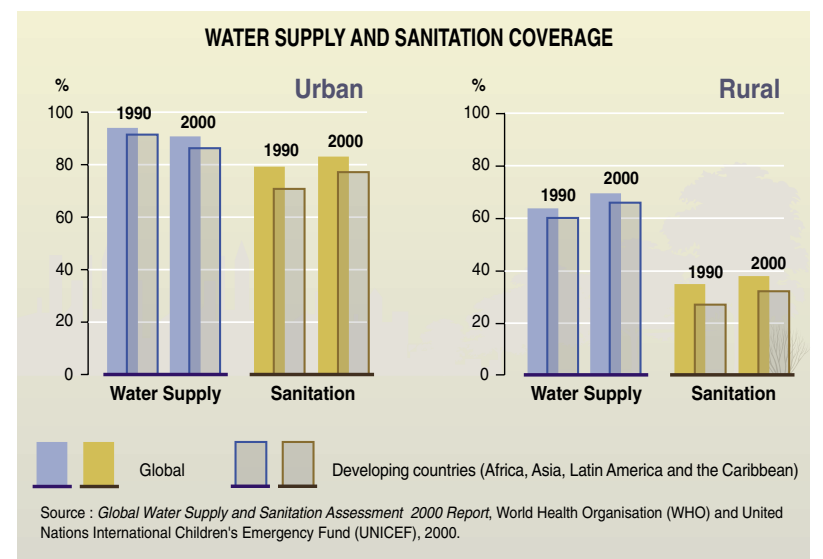
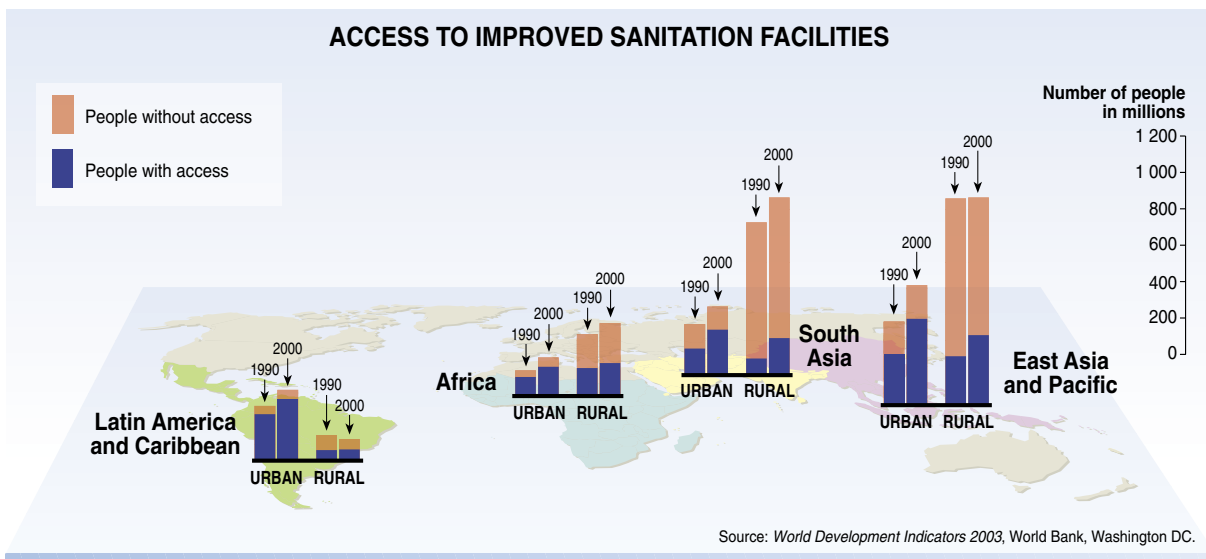
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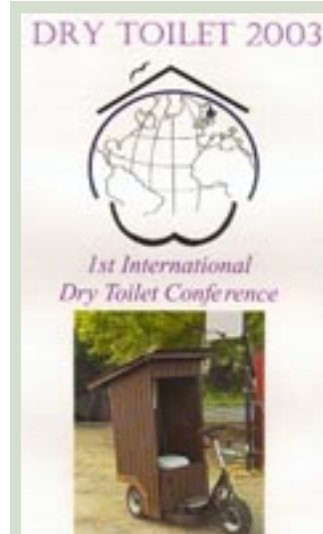
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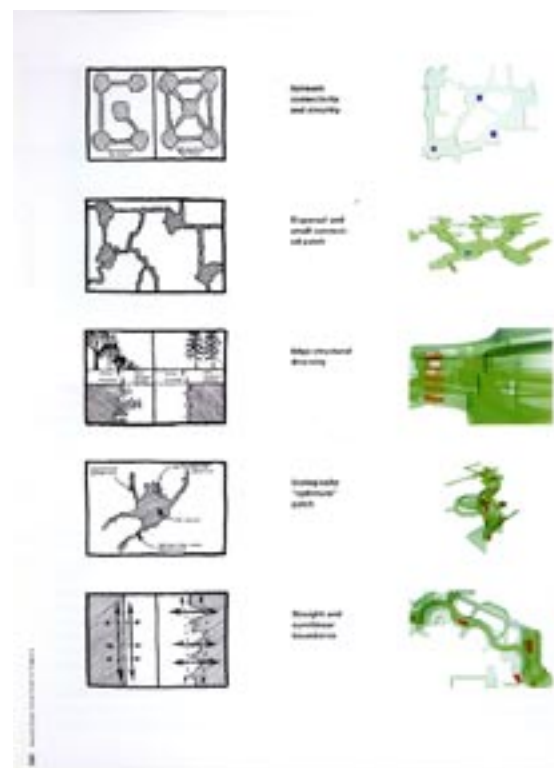
www.halfbakery.com/idea/Dry_20Toilet www.drytoilet.org/Finalreport.pdf



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Belgian stamp 1986
International Peace Year

In 2003, water was high on the international development agenda, but there was also alarm over human and environmental security. At the beginning of the year, there were more than 30 major conflicts (those with over 1,000 casualties, both military and civilian) in the world. Most of these, as has been the case for years, were intrastate¹. Most notable was the war in Iraq, as well as the Israeli-Palestinian conflict, the admission by Korea that it had nuclear weapons, the struggle for an independent Chechen Republic, ongoing conflict in Central Africa, and rebellion in West Africa. Although the linkages between environment and security have been recognised by specialist agencies for some time, integration into policy making has not been widely adopted – the article by William Mansfield III recounts the route taken in North America.

A branch of the environment-security nexus is the overwhelming vulnerability of the poor to environmental shocks and changes. In 2003 an estimated 43,000 people died in an earthquake in Iran², 3 million people were affected by flooding in India³, 15,000 people died in hot weather in France³, 1,500 people were left homeless when a fire swept through a shantytown on the outskirts of Lima, Peru⁴, and people in 38 countries (including Ethiopia, Tanzania, Zimbabwe, Haiti,

Nicaragua, and Afghanistan) required exceptional external food assistance⁵.

The majority of these were poor.

We have dedicated the next four pages to exposing some of the linkages between environment, risks, and security, advertising some recent work, and presenting some new, visual, perspectives. The article from Robert Lalasz for example, illustrates how management of a natural resource (water) can be achieved even when there are political differences. And the maps and stamps add a novel, graphical dimension to considering the linkages and formulating solutions. The Environmental Vulnerability Index, being developed by the South Pacific Geoscience Commission is something to look out for later in the year – when the Barbados Plan of Action is reviewed. The index will illustrate the particular vulnerabilities and priorities of Small Island Developing States.

1. Friends Committee on National Legislation – UN Funding and peacekeeping
2. Natural Disasters 2003 – In review
3. Ministry of Health, France.
4. ABC News online
5. Global Information and Early Warning System on Food and Agriculture

Mapping the environment to improve security

ENVSEC (Environment and Security) is an initiative of three organisations – the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), and the Organisation for Security and Cooperation in Europe (OSCE). So far activities have taken place in South-eastern Europe (Belgrade, December 2002), Central Asia (Ashgabad, January 2003) and in the Caucasus (Tbilisi, November 2003).

The objective of the initiative is to identify more clearly the linkages between environment and security, and also to help highlight the regions where a combination of these two issues (for example conflict over shared resources) poses a potentially worrying situation, needing attention and action. We are particularly interested in detecting geographical concentrations of industrial and mining activities potentially hazardous both for human health and environment. We feel that there is a need to use visualisation tools such as maps, charts or graphs to complement analyses provided by other scientific instruments. These can also be of help to better understand the geographical context and interconnectivity, and ultimately help societies to deal with priority issues. The project also encourages building capacities in countries to detect early indications of potential conflict and to integrate environmental management into conflict prevention and peace-building policies and activities.

What do we mean by security?

Human security means a life in peace, without tension and conflict – either social, political, or economic – between people and nations. It encompasses freedom from a range of risks: disasters, hunger, diseases, civil strife or war, terrorism, eviction, persecution or discrimination, financial deprivation and poverty, and more.

Why link environment and security?

Protection of the environment is good for security. Working together on solving environmental problems is often the simplest way to longer-term, more systematic and fundamental cooperation. Where conflicts occur, environmental cooperation may pave the way to broader solutions. Proactive environmental management also helps reduce vulnerability to natural disasters, disease outbreaks, climate change, and food shortages.

Conversely, environmental degradation can be bad for security. For example, damage to health or assets from pollution can lead to instability. Usually the

environment is not a single or the major source of a problem but can in some cases be important enough to worsen the situation. And conflicts are bad for the environment; physical damage and pollution caused by explosives, clearance of vegetation, fires, disruption of waste management infrastructure and services, and resettlement of large populations fleeing the conflict areas are some of the common impacts of conflict.

By looking at the environmental dimensions of conflict issues we try to foresee how some of the consequences can be avoided (a “conflict prevention assessment”).

Key components are:

- *Assessing the situation:* e.g. consultative mapping of the environment-security landscape in the Southern Caucasus.
- *Supporting cooperation:* e.g. encouraging dialogue between Uzbekistan, Tajikistan and Kyrgyzstan to prevent environmental accidents in the Fergana valley.
- *Promoting environmental management:* e.g. combating illegal trade in hazardous waste and chemicals.
- *Strengthening access to information and public participation in decision-making:* e.g. building capacity among environmental journalists and raising awareness of the environment-security linkages.

How are the linkages assessed and reported?

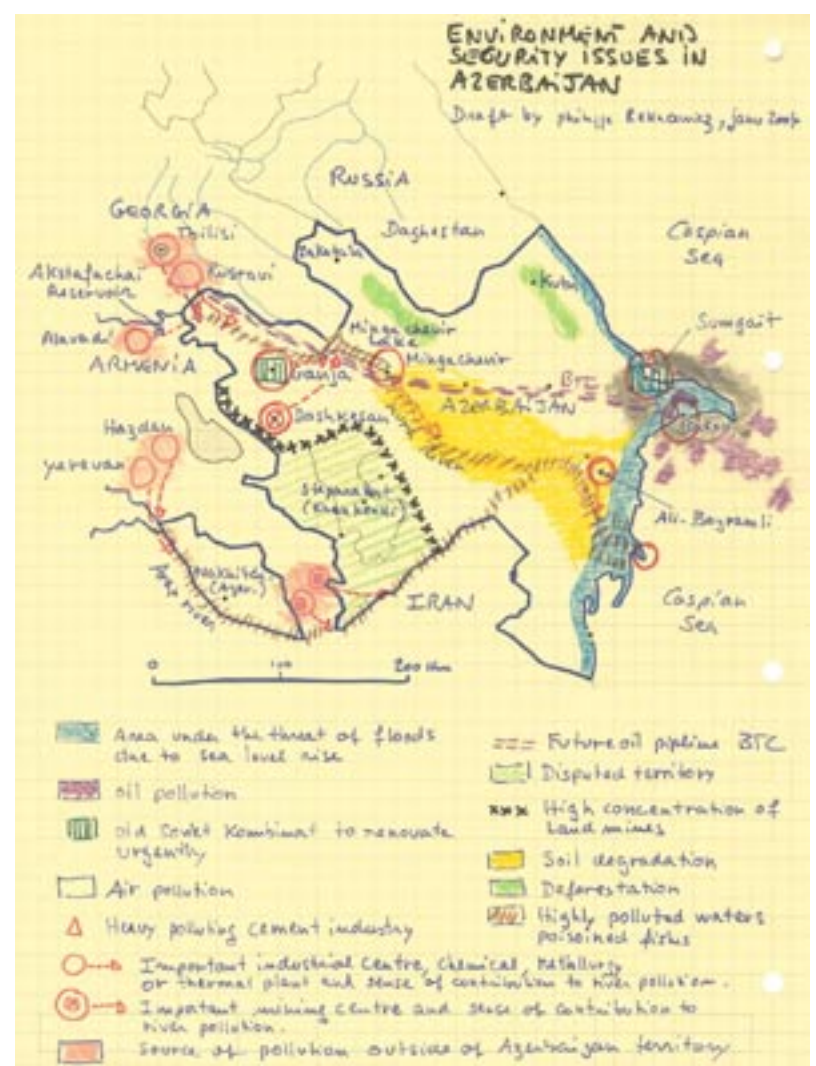
The initiative has been implemented in two phases; Phase 1 is a scoping exercise in consultation with the environmental experts from the Ministries of the Environment, representatives of NGOs and security organisations in the country or region. The objective is to map out areas of concern (“hotspots”), where the people and the environment are severely endangered and where a potential environment and security risk exists. Phase 2 is a more in-depth assessment (research) of selected hotspots involving work at a larger scale and investigations “in the field” with a strong involvement of both governmental and non-governmental local partners. Phase 2 focuses in particular on transboundary areas identified as areas of concern.

The maps here, resulting from consultations in the Caucasus region, illustrate our approach. The figures reflect the inputs of the national experts/participants. They were asked to share their knowledge on environmental and security issues in the Caucasus and locate these approximately on base maps (only coastline, borders, main rivers and cities were represented) provided

by the facilitators. The facilitators asked each individual participant to draw two maps by hand (one of their own country, and one of the region). They were to represent their perception of important environmental and security issues on each map. They could use any means for drawing the maps, as long as they provided a clear legend explaining corresponding symbols they used. When this task was completed, the maps of each participant were shared, and a composite image emerged, showing both localised hazards and widespread risks. The session concluded with the elaboration of a final regional map where the participants helped the facilitators, to aggregate, order, sort, and find a typology between all the issues put on the whiteboard during the “national” approach. The main idea was to pinpoint major transboundary problems deserving immediate attention, and which could become a case for bilateral or multilateral co-operation.

The maps produced as a result of this exercise depict the perception that participants have about the location of the “hot issues” in their geographical environment. In this respect, this category of maps can be considered to be somewhere between “mental maps” and “communication maps”, simplified to make problems better understood by an audience of non-specialists. As such, the elements appearing on the maps relate to empirical knowledge and perceived risks; they are not necessarily based on scientific study or accurately geo-referenced. Participants may exaggerate the importance of certain phenomena, underestimate the importance of others, misplace elements, lack knowledge of specific issues or even opportunistically “forget” to represent some sensitive issues. Therefore a post-consultation detailed investigation is needed. The draft maps are considered as preliminary working documents to be complemented with elements extracted from a compiled documentation selected from relevant reference literature (assessments, SoEs, various reports issued by governmental and non-governmental international organisations, national action plans). Maps have to be “fact-checked” against these references to eliminate major uncertainties in the final presentation of an ad hoc image.

The secretariat for the joint initiative is located at UNEP’s Regional Office for Europe in Geneva, and closely collaborates with UNEP’s GRID system, Adelphi Research, and the International Institute for Sustainable Development. For further information contact: Nikolai Denisov, United Nations Environment Programme, Regional Office for Europe, Geneva; Tel: +41 22 917 8281; nikolai.denisov@unep.ch. www.envsec.org.



Environment, Peace and Security

This past fall, at the opening of the General Assembly, the Secretary General of the UN explicitly linked the Millennium Development Goals to the three key principles of the UN: International Peace and Security; Development; and Human Rights and Democracy. In his speech, he talked about the crucial need to address

“soft threats” to security in a more systematic way. Environmental degradation, resource scarcity and resource abundance are all accepted as contributing to conflict in certain circumstances and, in different contexts, promoting cooperation. It is now being accepted that environmental services and resource availability are necessary conditions for sustainable

livelihood security in communities, countries, regions and the world.

The key challenge we now face is to undertake systematic and scientific assessments on the nature of this relationship among environment, resources and peace/security, for use in policy planning and implementation. Environmental priorities will need to be set using new crite-

ria. To date, many of the studies have been anecdotal or poorly designed. I view it as crucial that we adopt methodologies that are scientifically sound, politically credible, and involve experts and stakeholders from the regions under study. UNEP has launched a broader programme on Environment, Peace and Security to address these issues on a global scale. In

SouthEastern Europe, the Caucasus and Central Asia, the envsec initiative (see above), a partnership between OSCE, UNDP and UNEP has already begun to work on the ground.

Stephen Lonergan
Director, UNEP Division of Early Warning and Assessment

Sharing water makes good neighbours

Robert Lalasz

Friends of the Earth Middle East (FOEME), which was established in 1994 under the name EcoPeace, was the first regional environmental organisation to include Jordanian, Israeli, and Palestinian environmental groups and actors. Gidon Bromberg, FOEME's spokesperson, says that strict inclusiveness is practised: not only do they have offices in all three of the countries, but each of their projects (working to save the shrinking Dead Sea; trade and the environment; renewables; and water) must have coordinators from each country.

"The success of the organisation is that it decides on a single agenda, and then the staff from each country dialogues with that country's press and policy-makers," Bromberg explains. "It's a single effort to promote regional peace and environmental cooperation."

Abdel Rahman Sultan, also from FOEME, outlined the dire water situation in the Middle East, where population growth, unsustainable agricultural practices, and pollution are stretching this arid region's scarce water to the point of disaster.

He says that, while Middle East rivers such as the Jordan and Yarmouk are being tapped beyond capacity, untreated sewage is ruining both the region's surface water and its crucial aquifers (which are generally shared among many or all of the region's countries). Inequitable water distribution also

marks regional water management: while Israelis use an average of 300 cubic litres per capita per day, Palestinians receive merely 60 – barely above the generally agreed-upon minimum for human sustainability.

"Jordan receives water for only 12 hours each day and most Palestinian villages don't have continuous water flows" he says. Since the Palestinian national workforce is more dependent on water-intensive agriculture than those of surrounding countries, such shortfalls are particularly dangerous for Palestinian economic sustainability.

Sultan also notes that high national population growth rates will continue to widen an already large gap between the region's demand for water and its supply. Palestinian annual population growth rates average about 4%, and Israeli rates are about 3.5%. By 2040, Sultan says, the water demands of these burgeoning populations will outstrip a water supply that will increase only slightly despite a major drive to build desalination plants.

Better management

The region's water mismanagement also plays a crucial role: policies neglect adequate sanitation and wastewater treatment, and allow agriculture and domestic demand to oversubscribe water sources (leading to widespread salination, contamination, and evaporation).

The level of the Dead Sea, for example, is dropping by a meter a year. Infants in

the Gaza Strip are already afflicted with "blue baby" syndrome, attributable to high levels of nitrates in their water. Sultan also says that most cities in the West Bank depend solely on cesspools for their wastewater treatment.

Sultan advocates for Jordan, Israel, and the Palestinians to look in a comprehensive way at pollution prevention to avoid the systematic contamination of whole aquifers. "The three nations meet regularly on water division and distribution," he says, "but there is no discussion concerning pollution prevention. But this problem affects water supplies for the whole area."

Better neighbours

The Good Water Neighbors Project focuses on sensitising neighbouring border communities in the region to their shared water problems and then encourages sustainable solutions to those problems. The Project is working with five transboundary pairs of Israeli and Jordanian or Israeli and Palestinian municipalities. A typical project involves a Palestinian community with a water shortage and an Israeli neighbouring community that suffers from the Palestinian town's untreated sewage.

Bromberg explains that the Project's staff members come from the affected communities; these staff members educate their neighbours and elected officials about shared water realities between the paired communities and then work with these groups toward effective solutions. Between 20 and 50

"water trustees" from each town also commit to the effort.

"So much depends on the personal contact, on the dialogue we can develop between decision-makers," says Bromberg. "We cannot provide more water for any community or state – we can only raise awareness in each community about water realities. When neighbours can lobby for neighbours and be advocates, that's where we become effective."

Results from the Good Water Neighbours Project could be used to launch a region-wide media campaign to show that the commitment for shared water decision-making is there if opportunities are created. FOEME also hopes to foster regional water solutions based on these pilot efforts.

Better politics

According to Bromberg, the Middle East political landscape has often been less than cooperative with its efforts. "Different ministries and authorities at times have seen the diffusion of power as a threat."

"But municipalities have lost faith in their central governments recently, which helps us," adds Bromberg. "They're willing to take initiatives on their own that they wouldn't have three years ago."

In addition, Jordan has facilitated good movement toward regional cooperation on water issues since it signed its peace treaty with Israel.

Russian stamp 2001
Water – a natural treasure



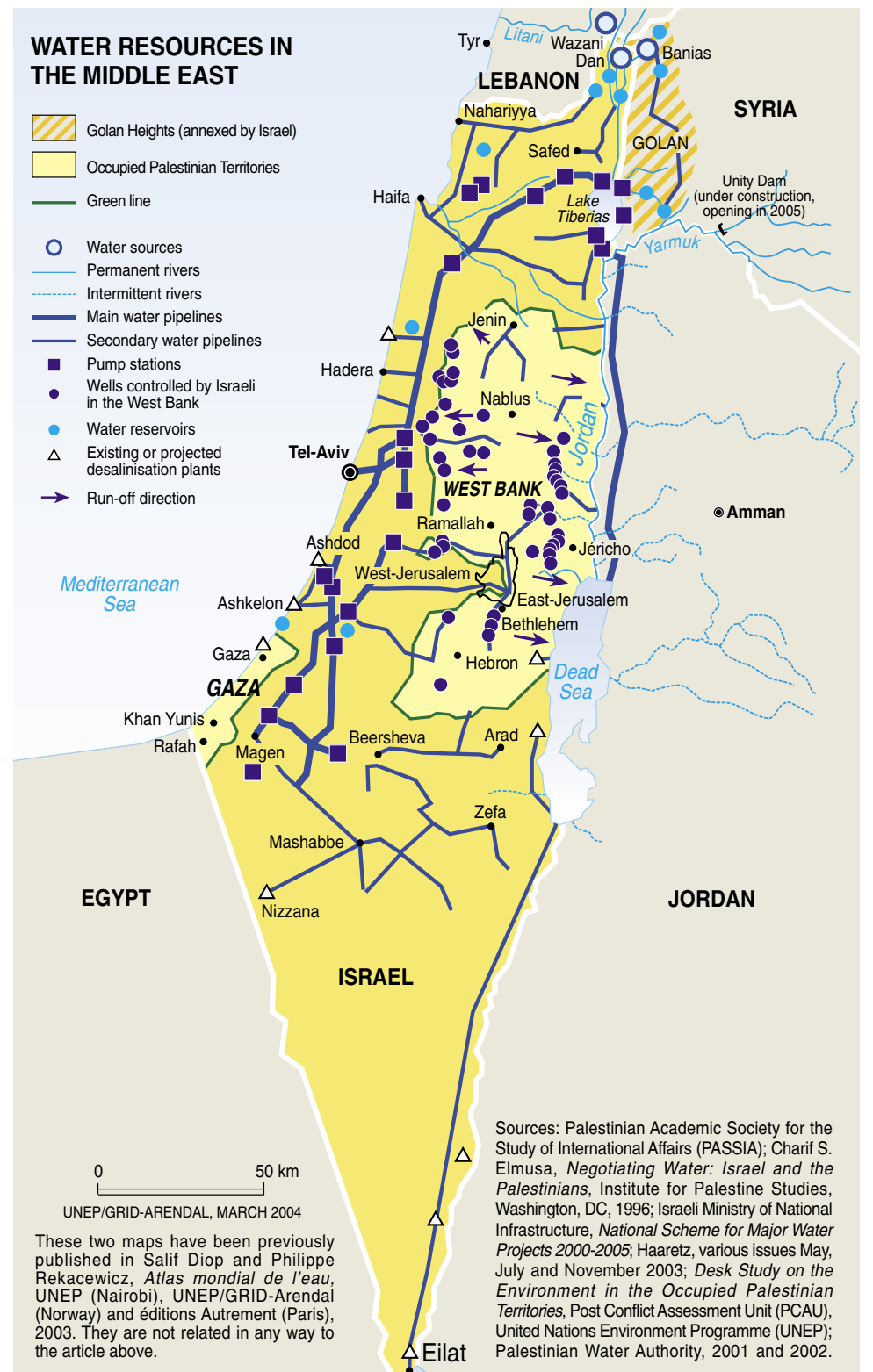
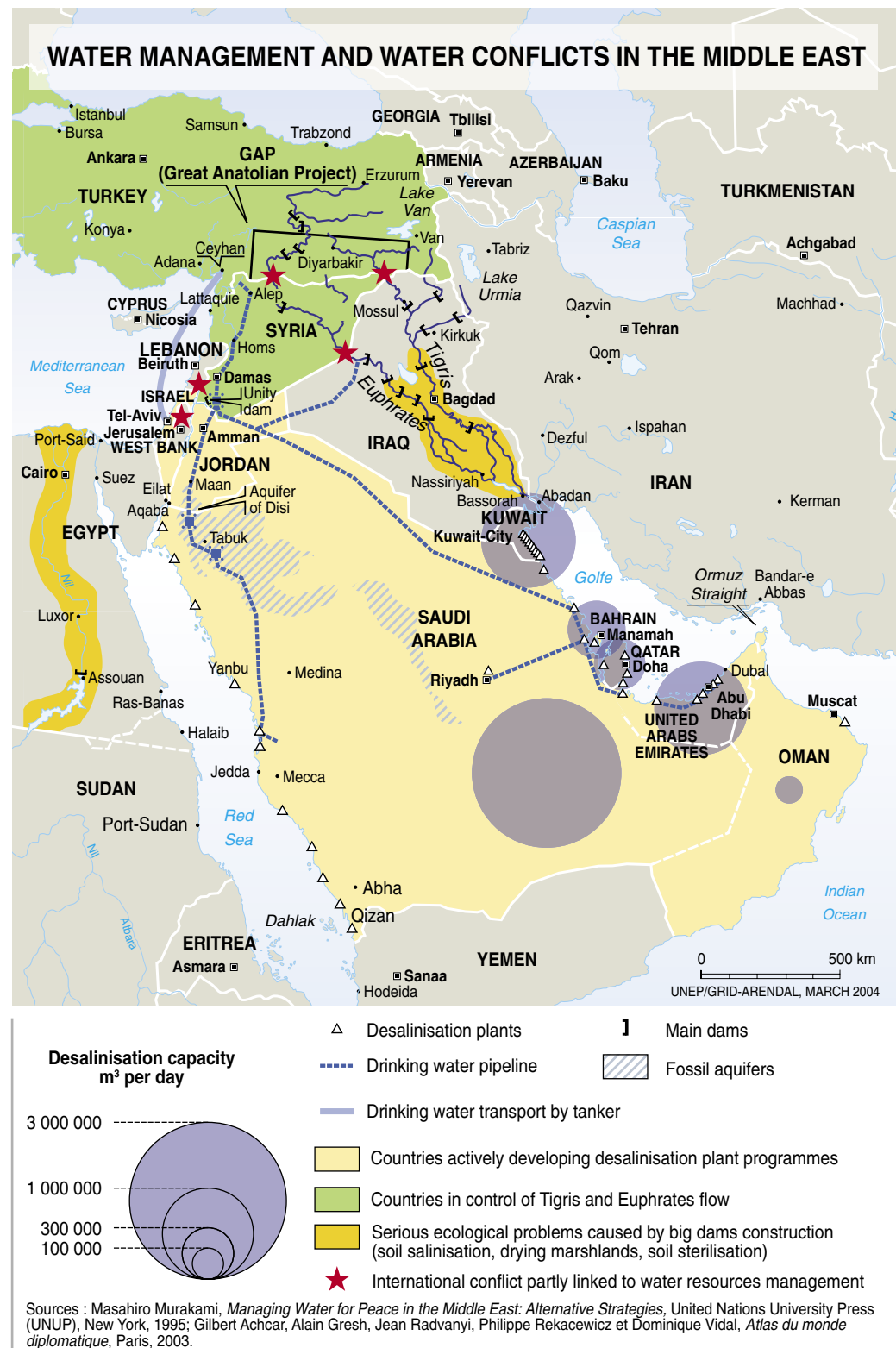
Agriculture is a major obstacle toward more efficient water use in the region, using 50% of the region's water supply.

"We are still planting bananas, citrus, and flowers, which are all highly demanding of fresh water," says Sultan. "We would like to have farmers pay for real water costs and treatment of agricultural wastes, and we need to change the crop patterns. But no one farmer will be willing to change his water usage, so it needs to be a communal decision."

Bromberg adds that the Middle East behaves "not as if we live in a desert, but as if we live in Europe. We can't make the desert bloom, and if we try we pay an incredible price. We need to focus on sustainable water use and enjoying the sun, not being the breadbasket for the rest of the world."

He ends by calling for more regional eco-tourism instead of agriculture as well as for attention to population issues as crucial steps toward addressing water scarcity there. "There simply is not room for everyone if we continue to behave in a water-rich fashion," he says. "The region's environmental community is only now aware of reducing population growth and immigration."

Robert Lalasz is senior writer at the Washington City Paper and the former editor of the Woodrow Wilson Center's Environmental Change and Security Project in Washington, DC. This article first appeared in PETS News (Spring 2003), published by the Woodrow Wilson Center's Environmental Change and Security Project. For the full, original version of this discussion visit www.wilsoncenter.org/ecsp.



The evolution of environmental security in a North American policy context

William H. Mansfield III

Over the past decade, there has been lively discussion and active research in North America on the issue of environmental security. It reached its peak in the mid- to late-1990s when then Vice President Al Gore championed the issue and Secretary of State Warren Christopher put environmental security on the US State Department's priority list. The State, Defense and Energy Departments assigned personnel to address the issue and signed a Memorandum of Understanding (MOU) to work together on it. During that period a good bit of definitional and analytical work was accomplished and published.

Recently, however, the US Government has placed a lower priority on exploring the linkage between environment and security. A small number of NGOs and academics still devote considerable time to environmental security, though they have been shifting their emphasis from the earlier, specific focus on environment to the linkage of security with poverty alleviation and sustainable development.

Road to consensus

The discussion in the 1990s covered a wide range of issues and was devoted to reaching a clear and agreed definition of "environmental security". Although there never was full agreement on the definition, there was a consensus on some of its basic elements. Nor did any agreement emerge on a programmatic approach. There were differences over what was being secured, what was being secured against, who was trying to provide security, and what methods were being employed to provide it.

Security analysts sceptical of concept
Not unexpectedly, many security experts voiced scepticism of the concept of environmental security. While they did not dispute the important connection among environment, social and economic issues, they disagreed with the characterisation of these issues as security concerns. They argued that health and well-being, disease and resource degradation certainly threatened human life, but insisted that grouping them as security matters was conceptually muddled.

They also argued that environmental "threats" are often, but not always, manifested over longer, incremental time scales and differ fundamentally from security issues in how they should be addressed. Given the differences, adding such a diversity of "threats" to traditional security concerns, they said, made the concept of security boundless and proportionately less useful as an analytical tool. They also charged that developing countries with primary concerns about development and poverty would consider environmental security an industrialised country effort to divert attention from their main concerns. They claimed the effort to link environment to security is an effort to spur interest in environmental issues, win public support and gain funding for the environment.

Pushing a new paradigm

The proponents of the environmental security concept, on the other hand, argued that with the end of the Cold War, security threats and issues were changing from the traditional military ones, making it necessary to envisage a broader concept of security. They postulated that environmental degradation can and does trigger, amplify and cause conflict and instability, and that all evidence suggested that given intensifying environmental degradation the situation would get worse.

They suggested further that a number of environmental threats could endanger countries. Constraints on natural resources, such as fresh water and cropland, the depletion of economically essential renewable and non-renewable resources, and rapid industrialisation, population growth and rapid urbanisation appeared to contribute to national insecurity. Ozone layer depletion led to wide scale cancer threats; global warming could spread disease and disrupt national water and agricultural patterns; forest destruction depleted a country's resource base and endangered its climate, water and soils threatened food security; and transboundary movement of toxic waste threatened security. So these issues had to be looked at in a broader context that called for a "redefinition" of security.

Early investigation of practical cases showed, though not always precisely and convincingly, that environmental issues contributed or could lead to con-

flikt among countries, citing such cases as Somalia, Haiti, Rwanda and Burundi, where population pressures and natural resource shortages had triggered unrest. But the case studies all seemed to demonstrate that it was a combination of factors, including environment, that lay at the heart of political and social instability and conflict or potential conflict.

The proponents for widening the horizon of security to include environment prescribed a corrective policy agenda for environmental security much like that for addressing the needs for achieving sustainable development. They outlined the needs for protecting the natural resource base, which underlay a country's and the world's economy. To buttress this they recommended building environmental institutional capacity, transferring technology, providing finance, promoting human rights and supporting democratisation processes as ways to instil environmental security. In the past few years, the policy approach has emphasised measures needed to promote sustainable development.

And by citing a wide variety of international agreements the proponents also made a convincing case that countries seeking to resolve environmental and sustainability problems were in fact helping to strengthen national security by promoting cooperation, collective action and generating international good-will and trust among themselves and disputing groups and countries.

High profile under Clinton

While differences of views among the groups and individuals over the merits of redefining security persisted, the proponents of the environmental security concept were very successful in generating support in the US during the Clinton Administration, which encouraged active environmental security discussion and activities in the 1990s. The President, Secretary of State, Director of Central Intelligence and Deputy Undersecretary of Defense all at one time or another identified the environment as a factor central to conflict and instability. In civil society, journalists, academics and environmental think-tanks analysed and publicised the issue.

In 1994, the Undersecretary of Defense grew interested in the concept

and organised in 1995 an interagency conference on "Environmental Security and National Security," which spawned a series of follow-up activities. An MOU between the Department of Defense, Department of Energy and Environmental Protection Agency (EPA) set up cooperative activities in environmental security. The cooperation led to a NATO Committee on the Challenges of Modern Society (CCMS) pilot study under the name of "Environment and Security in the International Context," which elaborated on environmental concerns. In April 1996, former Secretary of State Warren Christopher announced an unprecedented initiative to put environmental issues near the top of the US foreign policy agenda. The initiative ultimately contributed to the State Department decision to staff environmental nodes in a number of its embassies abroad.

This spate of interest led to internal and cooperative action at the bilateral level as well, especially in the US-Russian cooperative environment agreement, where nuclear and Arctic-related issues gained renewed attention. It also spurred, in selected cases, environmental agencies to draw upon the strategic assets of military and intelligence agencies. The CIA worked with the EPA to combat the black market trade in ozone-depleting CFCs. The intelligence community monitored illegal drift-net fishing. Intelligence satellite data was used to monitor natural disasters, and the like.

Academic and NGO programmes flourish

The existing and incipient environmental security programmes of a number of academic institutions and NGOs benefited from the keen governmental interest. Most prominent among these were the University of Toronto's Peace and Conflict Studies Program directed by Dr. Thomas Homer-Dixon; the Global Environmental Change and Human Security Project at the University of Victoria in British Columbia, chaired then by Dr. Stephen Loneragan; and in the US, the Environmental Change and Security Project of the Woodrow Wilson Center for Scholars in Washington, DC directed by Geoffrey Dabelko.

Spurred by the governmental, NGO and academic enthusiasm for the environ-

ment and security issue, a flurry of activity around the issue grew up in North America during the late 1990s and led to cooperation with institutions and researchers in other parts of the world. Also government agencies carried out an active investigation of this issue.

The active NGOs and academic groups explored the various types of environmental changes that affect human security. These include natural disasters and cumulative environmental changes such as deforestation, water scarcity, desertification, and climate change. They also have investigated environmental effects of industrial accidents, misconceived development projects, environmental and natural resource-related conflicts due to population growth and resource wars, and the like.

They conducted valuable research on the possible role of the traditional military institutions in environmental protection; for example, the use of military and intelligence institutions' logistical and intelligence assets, the environmental damages caused by the military in armed conflict (an especially sensitive subject in some circles) and "greening the military" by encouraging the armed forces to reduce pollution at their installations, and supporting environmental initiatives and helping to work on environmental activities, transferring technology to civilian sources and promoting disaster and humanitarian assistance.

Interest wanes during Bush Administration

But the 1990s seems to have been the high-water mark of the interest, at least in the US governmental and Washington policy level. With the election of the Bush Administration in the US in 2000 and the subsequent terrorism attacks in the US in September 2001, priority has shifted away from environmental security per se to terrorism, Afghanistan and the war in Iraq. The government does not really favour linking environment and security. Rather they see security more distinctly in a military context, and pursued actively through the use of arms, rather than foreign assistance.

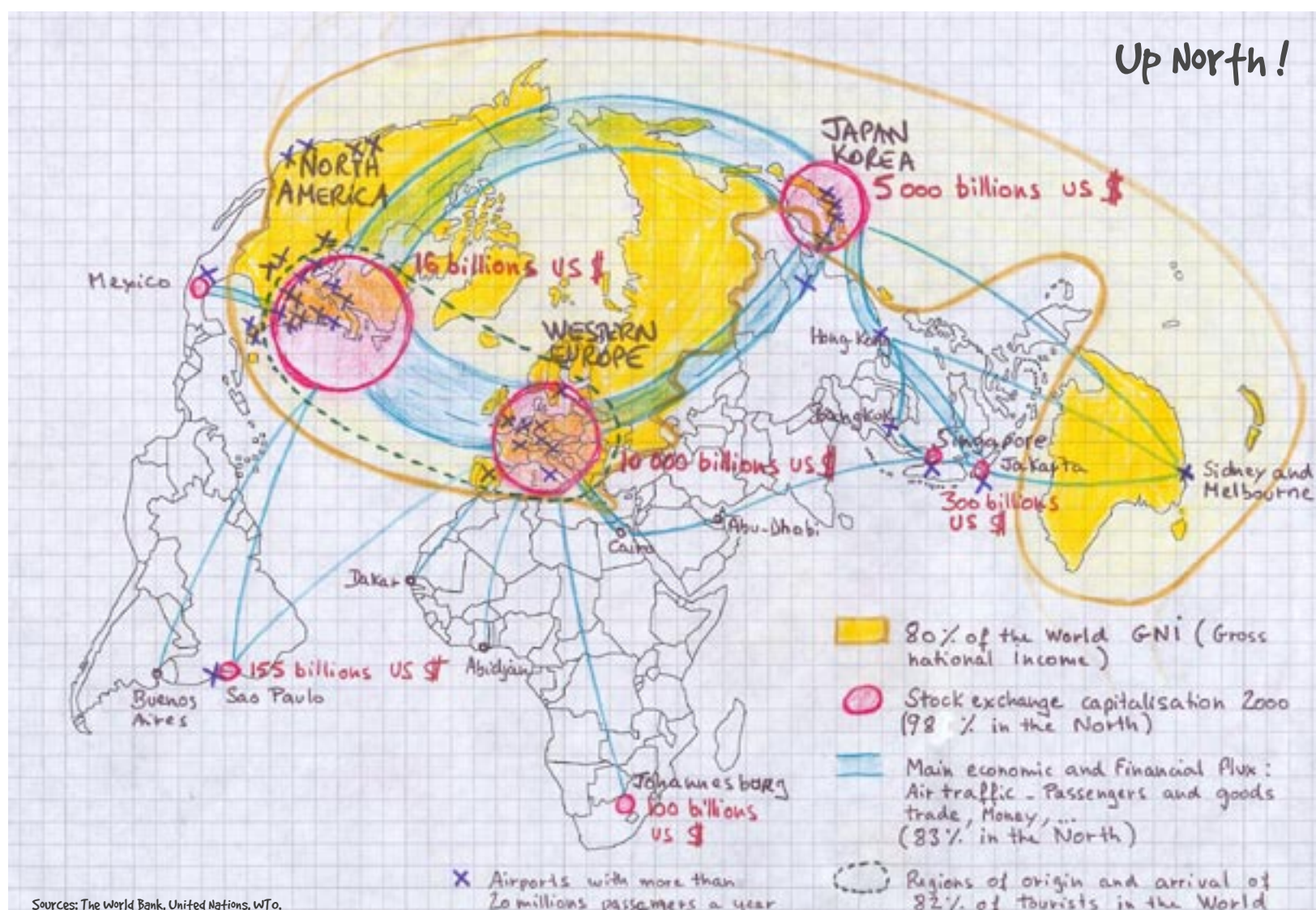
Widening the scope of security beyond environment

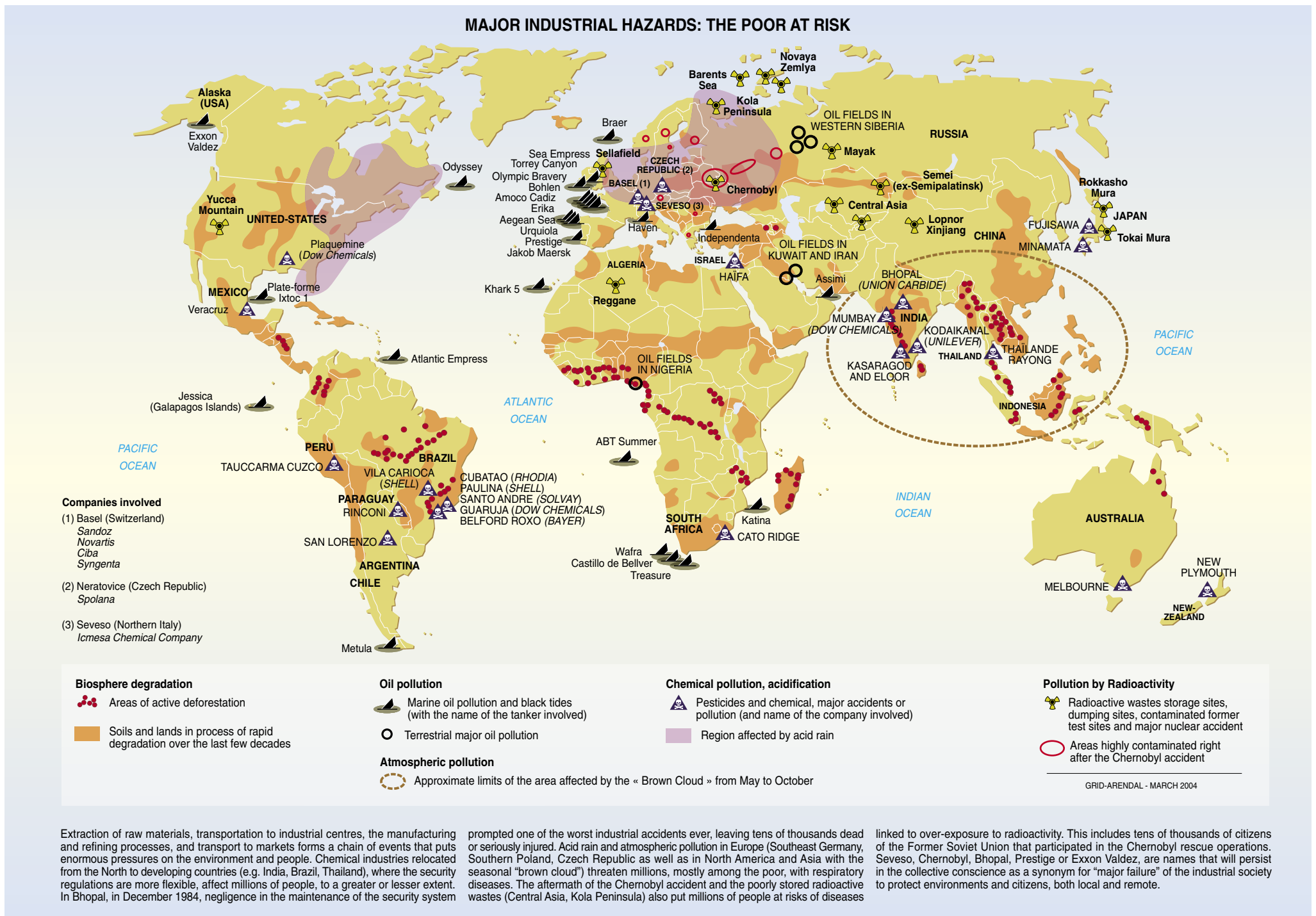
As a result, work on environmental security in the US and also Canada has lost a good bit of its momentum. And those involved in the field have sought to try to widen the net to find new aspects of environmental security that would appeal to the government's and policy makers' interests. This effort has led to a broader search for some of the underlying causes of human insecurity and conflict, of which environment is seen as but one of a number of causative factors, including political, geographic, ethnic, demographic, human development and resource scarcity.

Relating sustainable development to security

Recently, NGOs and academic groups have moved to explore the relationship of the environmental aspects of sustainable development to security. They are analysing the ways environmental and natural resource degradation limit resources available to governments and their peoples and thereby impose constraints on nations and their ability to develop sustainably. Environmental degradation contributes to water and energy scarcity, destruction of agricultural lands and forests, and climate change, thus limiting the resources available for national development and in many cases contributing to poverty, human deprivation and even disaffection, that can become one of the causes of civil strife and conflict and even sow the seeds of terrorism.

William H. Mansfield III is a Senior Advisor to UNEP working in UNEP's Regional Office for North America (RONA) in Washington, DC. He is a former Deputy Executive Director of UNEP.





Stamping our environmental disasters

Michael Glantz

When I was a kid, decades ago, I used to travel the world over. But I had to do it vicariously, by reading the travel sections of the local Sunday newspaper and by collecting stamps.

The desire, if not the need, for travel probably started innocently enough, with that stamp collection. I remember that some of the most beautiful stamps were from countries with names like Nyasaland, the Cayman Islands, and Rwanda-Burundi of Tana Tuva. Some of these were colonies but are now independent countries.

American stamps were also quite fascinating. In my imagination they took me to such faraway places as the Grand Canyon, Yellowstone National Park, Yosemite, and Bryce Canyon of Arcadia. I also got lots of history lessons about wars, treaties, presidents, and so on through the stamps that I collected, either by accident or by purchase at a local stamp shop.

The business of stamps

Stamps often carry lasting messages to the people who buy them as well as to the people who receive them. People collect stamps in a neatly organised album, or piled up in the top drawer of a desk.

Stamps have become big business for postal services around the globe. You can find, for example, US presidents on stamps of countries that seem to have only one thing to export – stamps of US presidents, movie stars or Walt Disney characters.

Stamps that deal with the natural environment present only the prettiest side

of nature: national parks, butterflies, birds, fish, and even different types of coral reefs. However, many countries that produce beautiful stamps of nature that pay homage to flora and fauna have laws in place that allow the wanton exploitation of the very environments that they so beautifully and proudly display on their postage stamps.

There are very few examples of exceptions, but a few do exist. During a trip to Moscow, I came across two stamps that focused on environmental problems. One was a Chernobyl stamp printed in the late 1980s. Another was an ecology stamp that portrayed the drying up of the Aral Sea in (at that time) Soviet Central Asia. I was surprised to find that a government had actually immortalised some of its major environmental disasters on its postage stamps. What a novel idea.

Stamps as a message

Perhaps the UN could consider this design as a possible postage stamp in order to focus attention on El Niño. Isn't it

time for all governments to "stamp their environmental problems?" So, here's my suggestion for the "Idea Bank."

For example, the US Postal Service produces stamps of the environmental problems that our society faces: Love Canal, the 42 environmental "hot spots" in the Great Lakes, the clear cutting of forests in the Pacific Northwest, oil spills, the effects of the destruction of wetlands, Three Mile Island, nuclear waste disposal, landfills, global warming, the ozone hole, the horrific consequences of landmine proliferation and so forth. Other countries could stamp their disasters.

To put these issues in front of the public on a daily basis, in a medium that many of us collect (especially young people), could help to educate the American public and policy-makers on the fragility of Earth.

Dr Michael Glantz is a Senior Scientist at the National Center for Atmospheric Research (NCAR). He is NCAR's only senior social scientist since it began 43 years ago. Before studying the interactions between climate and society (droughts, famines, freezes) and their impacts on political systems and on economies, he was a Metallurgical Engineer. With a PhD in Political Science, he studied (and visited) violent political revolutions in Africa. He created the www.fragileecologies.com website as a public service to those interested in climate-society-environment interactions.



Soviet stamp 1991
Chernobyl 26.4.1986



Soviet stamp 1991
Aral, region of ecological disaster



Soviet stamp 1991
Volga, region of ecological disaster

The Environmental Management Group (EMG) was established to enhance UN system-wide inter-agency coordination related to specific issues in the field of environment and human settlements. It is a central outcome of the endorsement by the General Assembly, in resolution 53/242, of a comprehensive series of measures designed to enhance coherent and coordinated action within the UN system in these areas, as recommended by the Secretary-General in his report on Environment and Human Settlements (A/53/463).

EMG adopts a problem solving, issue-management approach, to enable the formulation of effective, coherent and coordinated UN system responses to specific environment and human settlements challenges. EMG was designed as a flexible mechanism, only meeting when required to facilitate a timely approach to addressing emerging issues and integrate knowledge available in the UN system.

For more information visit www.unemg.org

Desk Study on the Environment in the Occupied Palestinian Territories

Desk Study on the Environment in the Occupied Palestinian Territories

The Middle East is a meeting point of many escalating environmental threats. This is particularly the case in the Occupied Palestinian Territories. Long-term environmental degradation has occurred over recent decades. In an already densely populated area, there are additional problems of scarcity of water resources and land, rapid population growth, a long-lasting refugee situation, climate change, desertification, and land degradation.

A team of UNEP experts carried out a comprehensive desk study on the environmental situation in the Occupied Palestinian Territories in October 2002. This desk study includes an assessment of freshwater quality and quantity, wastewater, solid and hazardous waste as well as conservation and biodiversity. It also includes an assessment of the capacity of the Palestinian Authority to face environmental challenges, and a review of the international cooperation in the environmental field. The study proposes action to be taken through 136 recommendations.

For more information visit <http://postconflict.unep.ch>



German stamp 1998
Protect the coast and sea

We have taken the liberty with this double page of diverging from the real world somewhat. We wanted to compare a science-fictional water shortage (from J.G. Ballard's *The Drought*) with a true situation of water shortage (from our own correspondent's visit to Mauritania). Our intention is to show that although not all countries are water stressed at present, unless the resource is managed properly, water availability and quality may pose future problems, and what is a fantasy situation now, may indeed become a reality.

We have also taken the opportunity to reflect on the UN International Year of Freshwater, and the vast array of literature that was published during 2003. Food for thought and food for action.

Then we present the "new cartography" – is it fact or fiction? Maps of household income are being used by large retail companies in deciding where to locate new stores; additional economic information such as credit card details are used to determine shopping patterns to target consumers more precisely. You decide!

The drought

The world-wide drought now in its fifth month was the culmination of a series of extended droughts that had taken place with increasing frequency all over the globe during the previous decade. Ten years earlier a critical shortage of world food-stuffs had occurred when the seasonal rainfall expected in a number of important agricultural areas had failed to materialise. One by one, areas as far apart as Saskatchewan and the Loire Valley, Kazakhstan and the Madras tea country were turned into arid dust-basins. The following months brought little more than a few inches of rain, and after two years these farmlands were totally devastated. Once their populations had resettled themselves elsewhere, these new deserts were abandoned for good.

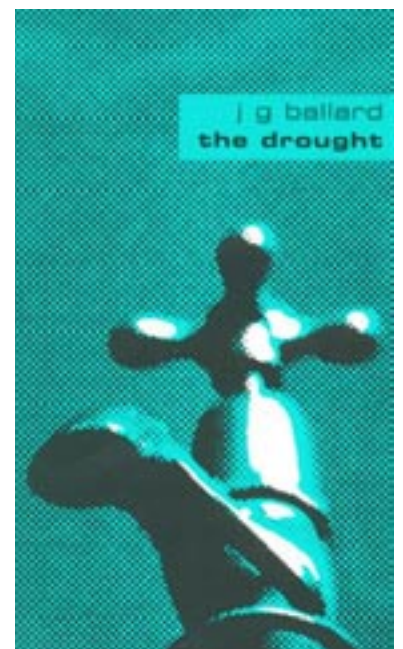
The continued appearance of more and more such areas on the map, and the added difficulties of making good the world's food supplies, led to the first attempts at some form of global weather control. A survey by the UN Food and Agriculture Organisation showed that everywhere river levels and water tables were falling. The two-and-a-half million square miles drained by the Amazon had shrunk to less than half this area. Scores of its tributaries had dried up completely, and aerial surveys discovered that much of the former rainforest was already dry and petrified. At Kharthoum, in lower Egypt, the White Nile was twenty feet below its mean level ten years earlier, and lower outlets were bored in the concrete barrage of the dam at Aswan.

Despite world-wide attempts at cloud-seeding, the amounts of rainfall continued to diminish. The seeding operations finally ended when it was obvious that not only was there no rain, but there were no clouds. At this point attention switched to the ultimate source of rainfall – the ocean surface. It needed

only the briefest scientific examination to show that here were the origins of the drought.

Covering the off-shore waters of the world's oceans, to a distance of about a thousand miles from the coast, was a thin but resilient mono-molecular film formed from a complex of saturated long-chain polymers, generated within the sea from the vast quantities of industrial wastes discharged into the ocean basins during the previous fifty years. This tough, oxygen-permeable membrane lay on the air-water interface and prevented almost all evaporation of surface water into the air space above. Although the structure of these polymers was quickly identified, no means was found of removing them. The saturated linkages produced in the perfect organic bath of the sea were completely non-reactive, and formed an intact seal broken only when the water was violently disturbed. Fleets of trawlers and naval craft equipped with rotating flails began to ply up and down the Atlantic and Pacific coasts of North America, and along the sea-boards of Western Europe, but without any long-term effects. Likewise, the removal of the entire surface water provided only a temporary respite – the film quickly replaced itself by lateral extension from the surrounding surface, recharged by precipitation from the reservoir below.

The mechanisms of formation of these polymers remained obscure, but millions of tons of highly reactive industrial wastes – unwanted petroleum fractions, contaminated catalysts and solvents – were still being vented into the sea, where they mingled with the wastes of atomic power stations and sewage schemes. Out of this brew the sea had constructed a skin no thicker than a few atoms, but sufficiently strong to devastate the lands it once irrigated.



Extract from *The Drought* reprinted by permission of HarperCollins Publishers Ltd. © J.G. Ballard 1985

J.G. Ballard was born in 1930 in Shanghai, China. After the attack on Pearl Harbour, Ballard and his family were placed in a civilian prison camp. They returned to England in 1946. After two years at Cambridge, where he read medicine, Ballard worked as a copywriter and a Covent Garden porter before going to Canada with the RAF. His first novel, *The Drowned World*, was written in 1961.

Ballard's best-selling visionary, apocalyptic fiction has led him to several literary awards. His acclaimed 1984 novel *Empire of the Sun*, based on his experiences in the prison camp, won the Guardian Fiction Prize and was short-listed for the Booker Prize. It was later filmed by Steven Spielberg. Other titles include: *A User's Guide to the Millennium*, *Cocaine Nights*, *High Rise*, *Concrete Island*, and *Super-Cannes*.



2003 was the UN International Year of Freshwater (www.wateryear2003.org). Throughout the year, throughout the world, over 100 official conferences, symposia and workshops were held, more than 90 exhibitions and public awareness meetings were staged, and 6 international awards were presented. Reports, brochures, press releases and policy briefings abounded, a selection of which are presented below. Achievements include renewed commitments, stronger partnerships, new initiatives, innovative programmes, and rational budgets. The year has finished; however, the challenges remain, and will be closely monitored at least until 2015, the day of reckoning against the Millennium Development Goals.

Quenching thirst in the urban sprawl

Philippe Rekacewicz

"It is difficult to imagine a more hostile site to create a town! To the north, Nouakchott is being eaten away by the sand while to the south it is the salt that is gaining ground. And to make matters worse, there's no water!" This is how Mohamed Salim Bamba, mayor of Teyaret, quickly sums up the situation. Teyaret, the northernmost of the nine districts that form the new urban community of Nouakchott, is particularly affected by water scarcity and rationing. Nouakchott, Mauritania's capital, sprang up out of the desert at the end of the 1950s and grew steadily until 1970. Then, following several years of drought and the ensuing rural exodus, its population increased tenfold over a period of thirty years. The city's hydraulic equipment was designed to supply between 60 000 and 80 000 inhabitants in the 1980s and 1990s. These same installations now have to provide water for a population estimated at between 900 000 and 1 000 000 people, a large proportion of whom are concentrated in the outskirts of the city where there is neither water supply nor electricity. "The population is increasing much faster than our capacity to equip the new districts with water tanks and public standpipes," complained an engineer from the Nouakchott Urban Community. "As a result, instead of focusing our efforts on renovating and completing the existing water supply system, all we have time for is dealing with emergencies and sending water trucks to the areas with the worst shortages. And even then we are a long way from meeting all the needs."

"Urban thirst" is so severe that the authorities in some districts have introduced drastic measures to restrict water consumption. In particular, market gardening, an important resource for many households, has been banned, and the previously cultivated areas have now become huge rubbish tips. In the slums and shantytowns of Nouakchott, people are dying of thirst or of diseases caused by drinking water that is unfit for consumption, while just a few hundred metres away, the swimming pools in the two luxury hotels, the Novotel and Mercure (Groupe Ac-

cor, turnover of 7 billion euros in 2002) are filled with tens of thousands of litres of clear glistening water that is renewed regularly with no concern over supply. In a city where every single litre counts, it might be reasonable to ask how many tens of thousands of households could be supplied with this water reserved exclusively for splashing about in.

Nouakchott gets its water from the Tzerza aquifer, situated at Idini, about fifty kilometres away along the road to Néma. A high pressure main carries the water as far as a principal water tower situated near the Presidential Palace. This is the nerve centre of the water distribution system for the entire city of Nouakchott. From here, water is distributed to four secondary water towers located in different parts of the urban area (two of which are reserved for the army and the Urban Community), as well as to large industrial, public and private users (factories, hotels, and certain public standpipes connected to the piped supply network, for example).

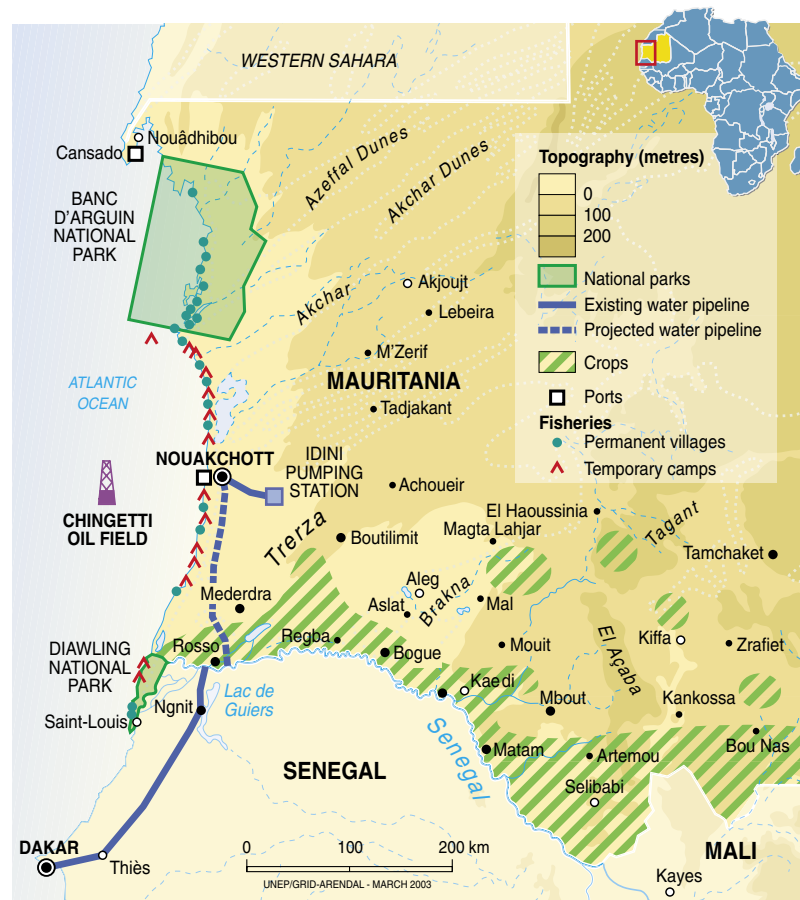
The few hundred public standpipes in Nouakchott are real meeting places for local residents. The standpipe is the "pulse" of the district, the starting point of the incessant parade of women and children carrying buckets and bowls, and of carters with their donkeys and barrels, coming and going in no apparent order to deliver water to the dwellings in the surrounding area. Few households are connected to Nouakchott's piped water supply network. The drinking water supply system is rudimentary and essentially serves only the city centre and a few districts on the outskirts. With 90% of the population getting their water from water carts or trucks, it is not difficult to appreciate the strategic importance of standpipes and their managers, key players in the water distribution chain.

Water management, or at least the transport of water from its source to the city, is still a public service with a regulated pricing system. Although the State owns the system, it does not have the means to supply the entire population and has therefore transferred aspects of water standpipe management

to private operators, both official and unofficial, thereby creating a great diversity of situations. Users can get their supplies themselves at the State standpipes managed by the "Commissariat à la lutte contre la pauvreté" (Commission on the Fight Against Poverty) or at private standpipes (where prices are generally higher), but also from people who are fortunate enough to be connected to the piped water supply system and who resell the water they receive. A lot of speculation goes on, and depending on the heat and water scarcity, prices during the year can vary by a factor of six, literally crippling the poorest families, who may have to spend half of their income on water. The increasing number of players in the distribution chain (who obviously have to earn a living) also helps to push up prices.

Standpipe managers, who work for the government or the private sector, have contracts with the Water Company (SNE) and resell water on a wholesale or retail basis to inhabitants or to water cart owners. Private households connected to the piped network are considered to be "end users" although they resell the water at a profit. Water cart owners buy water from the standpipes and pay a special municipal tax that gives them the right to distribute water to homes. Water distribution is therefore a very complex business sector that generates a tremendous number of jobs. Standpipe managers and carters play an important social role and provide a valuable service, even though they themselves also indulge in speculation.

A major ongoing problem is that of hygiene. In theory, water is clean when it arrives at the public standpipes, but it is then carried to dwellings in recycled petrol or chemical containers. The water is often contaminated (by heavy metals or parasites), and once in homes is not necessarily purified with bleach as recommended by the Ministry of Health. The standpipes themselves are not maintained or "cleaned" as often as they should be, and over time the increasing number of puddles of stagnant water can become real breeding grounds for parasites. This water,



which is unfit for human consumption and the primary cause of disease and mortality among children, is on average three to four times more expensive in the poor districts than in the well-to-do areas in the city centre.

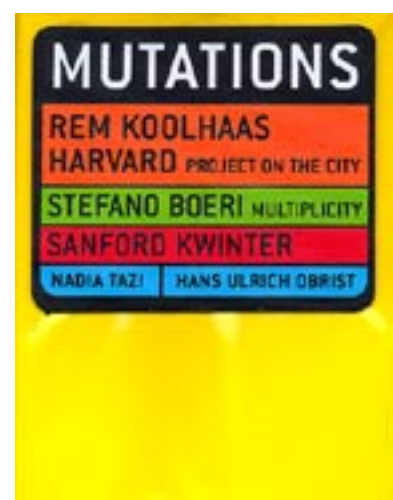
The supply of water to public standpipes, whether via the piped network or from tankers, is also frequently disrupted. It is common for the piped supply system (and trucks) to break down, which explains why some water tanks and local water points sometimes remain dry for several days. Water arrives at the standpipes at a price varying between 20 and 30 oughiyas (0.10 euro) for a 200-litre barrel, and is then resold to water cart owners for 60 to 80 oughiyas (0.26 euro) who sell it at the market price. Price differences can be huge: 150 to 300 oughiyas (0.50 to 1 euro) when the supply is plentiful, and between 500 and 1 000 oughiyas in periods of extreme heat and water scarcity (1.6 to 3.3 euros). These huge price variations mean that families live in a state of constant anxiety, never knowing from one day to the next whether they will obtain water (either because there isn't any, or because it is too expensive).

Many do not have the financial means to store water in order to survive for three or four days while they find a source of supply. A household of 8 to 10 persons uses on average one 200-litre barrel every 24 hours (if they are "very economical" in their consumption), whereas normal water requirements are estimated to be around 45/50 litres per person per day.

Nouakchott lives in a permanent state of water scarcity. And yet, according to Mauritanian hydrogeologists the country's water resources are sufficient to supply the entire population for very many years provided they are reasonably and more efficiently managed, and provided significant amounts of the 40 000 m³ of water extracted daily from the Idini groundwater aquifer do not disappear in a decaying network through evaporation, infiltration, or the numerous illicit connections upstream and downstream of the point where the water main arrives in Nouakchott.

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Translated by Sheila Carrodus.



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Irrigation in rural India and the decentralisation test

"In India, 69% of people in non-irrigated areas are poor; in irrigated areas this figure falls to 2%."

Water for People, Water for Life.

The United Nations World Water Development Report, UNESCO 2003

Frédéric Landy and Emmanuel Bon

The Green Revolution launched in India in the 1960s freely promoted irrigation as being in the national interest. Overexploitation of water resources and the ensuing exhaustion of water tables have prompted the authorities to respond in order to avoid social and environmental ravages. With help from leading international sponsors, India has set up development programmes based on participative management by the population.

Wells: The vicious circle

The village of Bhairkhanpalle is in the state of Andhra Pradesh, in the heart of the Indian peninsula. Geography has given this underdeveloped area around Bhairkhanpalle, in the Telangana, a semi-arid climate; history has given it an non-egalitarian social structure typical of many rural areas. Geology has bequeathed a granite substratum, making water tables hard to access and well-drilling extremely costly and haphazard. Yet there are plenty of wells in Bhairkhanpalle. The open wells used until the 1980s have given way to about 100 drilled wells equipped with submersible motor pumps, which draw water from as deep as 60 metres (compared to 15 metres with open wells). But too many wells have led to competition: as a result, two-thirds of them are already dry and have had to be abandoned. There are now 575,000 wells in the state of Andhra Pradesh, nine times more than in 1975. But how many actually work? In Bhairkhanpalle, one farmer drilled no fewer than 30 wells over four hectares, and only three yielded water. Some wells are only 1.5 metres apart. In many villages the irrigated area is shrinking, whereas the number of wells is paradoxically growing: the less water there is, the more wells are drilled, which makes water even scarcer. This vicious circle ultimately amounts to social and environmental ravage – not to mention that only the better-off farmers have any chance of maintaining their livelihoods, given that a well costs about 50,000 rupees¹. Indian peasants have apparently decided not to face facts. A few months ago, a farmer from Bhairkhanpalle, unable to pay back the loan he took out for a well, took his own life. The same phenomenon can be observed in the alluvial plain of the Ganges, where in some places water-table levels are dropping by more than one metre a year. "Without water, the village will become a desert and we'll have to leave," said a despairing villager.

Both a cash and a food crop, rice runs counter to nature in semi-arid environments. Widespread protests are now building against the high level of its floor price and the federal government's purchase of part of production, which is intended to support prices and agricultural income artificially. These measures, which are environmentally harmful because they involve drawing from water tables, can hardly be justified in social terms because small rice farmers typically have no saleable surplus. Rice is, though, a profitable cash crop for larger-scale farmers. It still provides most of the daily food intake for most rural households, making it all the harder to replace with less water-thirsty crops. And in the country that is home to 40% of the world's "malnourished", there is another economic paradox: India is reduced to selling its surpluses by subsidising the price of rice for export, and is now one of the world's leading exporters.

Market failures

Water is also overused and wasted because it costs nothing. The electricity needed to run pumps is free in some states and heavily subsidised elsewhere, although the public agencies in charge of generating and distributing electricity are structurally loss-making. The power comes on for a few hours a day at most, so the pumps operate whenever possible to maximise the extraction of water; there is huge wastage. Farmers ultimately fall victim to the subsidies designed to help them. In areas where canals can provide irrigation, the price of water does not cover the cost of operating and maintaining the network. And the old village ponds – which the colonial government had taken over running because the farmers were supposedly incapable of rational utilisation – are generally no longer maintained for want of financial and human resources. The government, unable to strike the right balance between rights and duties, completely disempowered the farmers, who have lost all interest in the common good and now prefer to run their own wells when they can afford to.

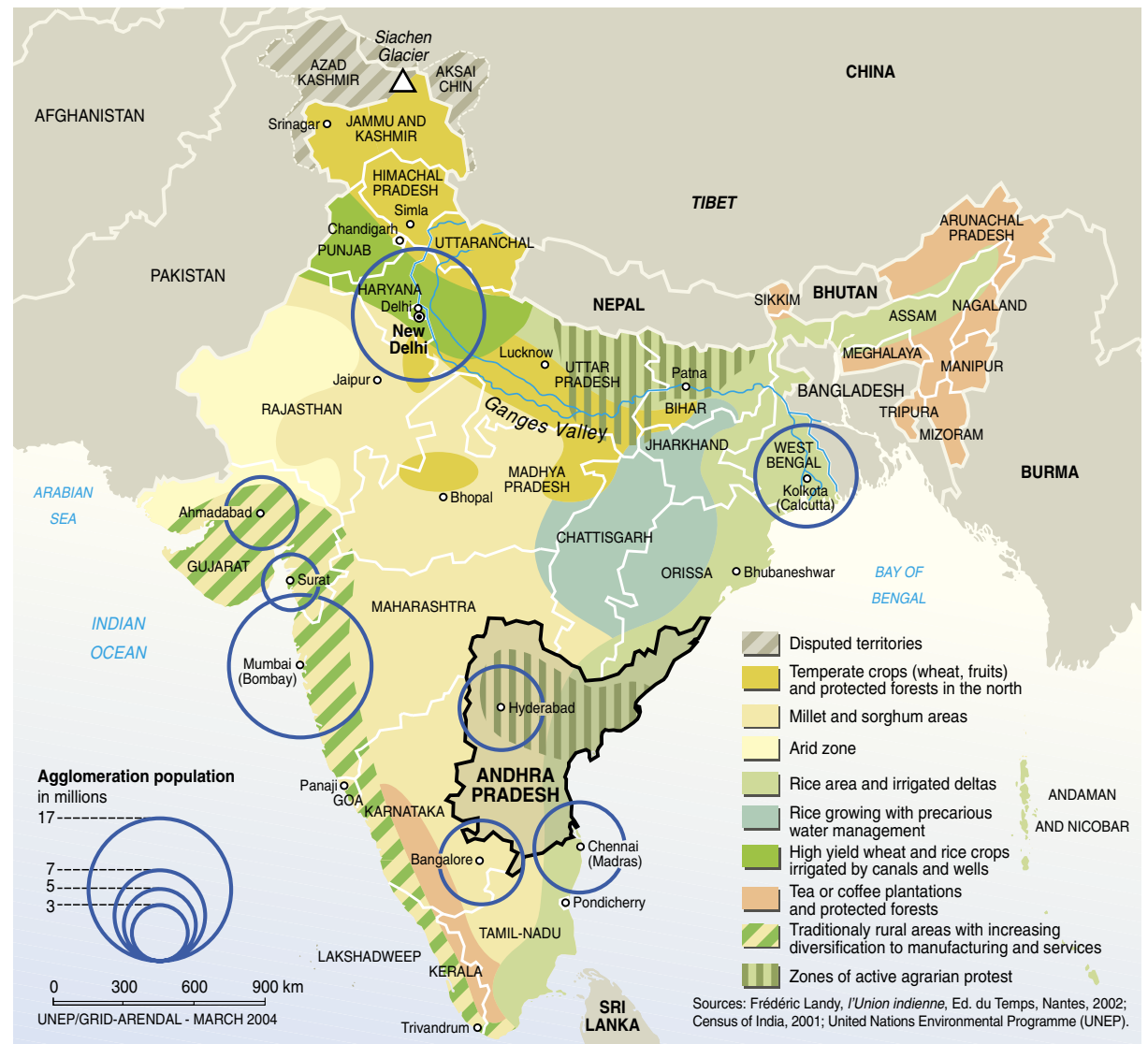
In a situation dominated by collective schemes (alternative water distribution and payment of dues to maintain infrastructures) and an organisation designed to share a scanty resource, irrigation using private wells seems to offer a form of independence from surface water. But it is illusory. There is a de facto interdependence between surface water and groundwater; moreover, farmers whose wells draw from the same source create fierce competition – the origin of the water shortage – realising in the end that to survive their only option is to share more fairly. Yet individual choices nearly always prevail: access to water is privatised, and experience shows that this is a far from lasting solution to the problem of its rarity.

What are the solutions, if any? Extract more water? The Indian government recently relaunched a plan to create a dense network of canals to link the large rivers. The main dam over the Narmada will soon be complete, as will the river Tehri dam in the Himalayas. But what then? Supply-side policies alone have reached their limits. Major reservoir-dam construction projects, the butt of criticism in India and internationally, are being abandoned owing to their environmental, economic and human costs. So the solution is not to find more water but to waste less and use it better. A proper joint-system of management must be set up, instilling in everyone a sense of communal solidarity and responsibility for the resource.

Villagers find it very hard to envisage operational collective-regulation. A farmer explains: "The farmers think the water and land belong to them, and can't do anything if their neighbour wants to drill a well. The principle is that everyone can do as they wish on their land, and live as they please." When the need to introduce a minimum distance between wells is raised, the reply is invariably, "Only the state can impose rules." But can the state bring in and enforce collective rules without minimal consent and the villagers' active participation?

Participative management of irrigation

The 1990s marked a change in the government's attitude to local participation. It had observed two things: the failure of nature conservation policies, and the slow recognition of traditional know-how and social practices in resource management. Andhra Pradesh



became a pioneer state in the participative management of irrigation². A 1997 law transferred the management of all the surface irrigation systems to the farmers, who automatically found themselves convened into water users' associations.

This policy only applies to surface water. The fast rise in the number of associations is due primarily to financial incentives. The World Bank funded most of the project with a \$142m loan in 1998. The associations, which each received 700,000 rupees, enjoyed undeniable success, but there is every reason to fear that they will collapse when the money dries up.

Officially pricing policy is supposed to comply with the French principle that water must pay for itself. Although the price has stayed fairly low, it tripled in 1997. Most farmers no longer view this contribution as a tax but as fair payment for a service, acknowledging that the associations need to work properly. But the state still owns and controls the irrigation infrastructure, and the associations are not yet in charge of collecting contributions. Despite extensive media coverage of the scheme's success, some farmers still do not know about it. And when elections are held, the turn-out is often very low (less than 10%). A lot of local businessmen who used to work hand-in-hand with the government, have managed to have themselves voted in as chairmen of the associations. "We've got no choice," a peasant acknowledges, "and in any case a chairman from a lower class or caste would have no clout in his dealings with the authorities and the private sector. It's better to elect a notable." The state pays 50,000 rupees to associations that elect their chairmen unanimously – an incentive that severely diminishes the democratic nature of such elections.

"Watershed management schemes", which have also become participative, are encountering similar difficulties. They try to reconcile agricultural development and environmental protection, with the primary objective of maintaining the quality of the soil and farming land; but the conservation measures mainly favour landowning farmers and traditional beneficiaries. The only ad-

vantage for farm labourers, stock farmers and craftsmen is paid work to build small sloping dams designed by technicians and replanting of trees. For the government, participation is mainly a chance to reaffirm that citizens have duties first and rights second

The limits of small-step development

Launched in 2001 by the UK's international development ministry, the Andhra Pradesh Rural Livelihoods Programme (4) is the most recent participative development programme to operate at the micro-catchment area level. The areas' natural boundaries are the watersheds, but for easier management these have been redrawn along local administrative boundaries, with a maximum area of 500 hectares. The programme's main innovation is to decentralise the design of the development projects. Each year, the village council decides democratically which projects to implement, according to local needs: a hill dam, forest nursery or cattle enclosure. The programme's primary focus is on local resources and existing possibilities. The population must become the prime mover of its development, with the government only offering assistance. One slogan applies: Think local, act local. This is the framework within which Bhairkhanpalle voted to build a communal watering.

Yet there are no plans to eliminate or even reduce the economic and social constraints that affect the sustainable use of resources, in particular the lack of equality in the farming community with respect to land ownership, class, caste and gender. The pond-reservoirs once used to irrigate low-lying fields are now often used to percolate surface water down to refill the water tables. Farmers who previously used pond water to irrigate their fields have no real choice but to comply with the new practices. Wealthy drilled-well owners are proving to be the sole beneficiaries of this conservation measure: it gives them exclusive access to well water, which they could sell to their less affluent neighbours. These inequalities in power and representation in collective decision-making are a major obstacle to a truly participative approach, and there is no doubt that decentralisation could aggravate most of these inequali-

ties if the counterweight of the public authorities disappeared. The village councils are still dominated by notables and political factions. Granted, the chairperson on each municipal council is now elected using quotas that favour women, untouchable castes and tribes. For instance, a woman chairs the Bhairkhanpalle council. But in a neighbouring village, the chairperson is the wife of the biggest local landowner.

The new participation-based development initiatives, which appear to be progressive and democratic, hide a dark reality. The state primarily views participation as an instrument, a convenient way of boosting the efficiency of its actions by transferring certain management costs to local actors without fundamentally calling into question the usual operating standards. Like other programmes currently being implemented in India, notably in the forestry sector, an overly egalitarian conception of society prevents projects from giving priority to helping those most in need. It is crucial to target the most underprivileged; otherwise, the free workings of social forces will above all benefit the groups best placed socially and politically to gain from decentralisation and deregulation.

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Translated by Paul Jones.

1. One rupee is only worth about 0.02 euros but its local value, in terms of purchasing power, is much greater. In the Telangana region, a day's work during the rice harvest pays around 30 rupees, and a kilo of rice costs about 10 rupees.
2. See in particular J. Weber and J.-P. Reveret, *Ressources renouvelables: les leçons de la privatisation*, Le Monde Diplomatique, October 1993.
3. R. Hooja et al. (dired.), *Users in Water Management. The Andhra Model and its Replicability in India*, Rawat, New Delhi, 2002. L.K. Joshi, R. Hooja (ed.), *Participatory Irrigation Management. Paradigm for the 21st century*, Rawat, New Delhi, 2000, 2 vol.
4. See www.aplivelihoods.org

Pricing water

Tom Jones

Anything scarce and in demand commands a price; this is one of the basic principles of economics. Water is scarce in some contexts (drought, degraded quality), so water pricing is increasingly seen as an acceptable instrument of public policy. Water-use charges, pollution charges, tradable permits for water withdrawals or release of specific pollutants, and fines are all market-based approaches that can contribute to making water more accessible, healthier and more sustainable over the long term. For this reason, OECD countries are working toward the goal of "internalising" the full marginal costs (including environment costs) into decisions that affect water use and water quality.

One particular area of water policy that has become increasingly subject to pricing principles is that of public water supply and wastewater services. Efficient and effective water pricing systems provide incentives for efficient water use and for water quality protection. They also generate funds for necessary infrastructure development and expansion, and provide a good basis for ensuring that water services can be provided to all citizens at an affordable price. The metering of water consumption is a prerequisite for the application of efficient water pricing policies. About two-thirds of OECD member countries already meter more than 90% of single-family houses, although universal metering remains a controversial issue in some contexts.

Selective metering is less controversial, particularly if the public knows that new water resources are scarce, or if the metering applies to discretionary water use, like private swimming pools. Metering new homes is also more widely accepted than converting older ones.

Most of the OECD area population still live in apartments, where metering tends to be for water supplies entering the building, rather than for individual apartments, although this is starting to change.

Charging in volumes

In terms of the structure of prices for public water services, there is a clear trend in OECD countries away from fixed charges and towards volumetric charging; in other words, the more you use, the more you pay. Even where fixed charges still exist, the policy of allowing large free allowances is in decline. Hungary, Poland and the Czech Republic, for example, already use pricing systems based solely on volumetric pricing, with no fixed charge element at all.

To encourage conservation, the trend in volumetric charging is also moving away from decreasing-block tariffs and towards increasing-block ones. This means that the charge increases with each additional unit of water used or wastewater treated, rather than providing discounts to high-volume users. The pricing systems for wastewater treatment are rather more complicated than they are for water supply. This is partly because responsibility for sewerage, sewage treatment, and drainage is typically held by different bodies, each with their own principles and practices. Another complicating factor is that use of water directly from natural sources in the environment represents roughly 75% of total water consumption by the industrial sector (on average) in OECD countries.

Nevertheless, the basic charges for wastewater services are sometimes linked directly to volumes of water delivered from the public water supply system. Where this is the case, the structure of wastewater charges tends to mirror that of water supply systems.

Overall, however, industrial water consumption levels are actually not a very good proxy for industrial sewerage and sewage disposal costs, as discharges vary so much from industry to industry. Hence the trend in OECD countries towards separating industrial water use charges from wastewater charges.

Pollution costs

In most countries, standard sewerage charges are supplemented by "special strength" charges designed to recover the costs of any extra capacity required to treat particular industrial effluents. Industrial effluent charges can also be set by pollution content. In France, for example, a charge is levied on the eight types of pollutants deemed most dangerous and difficult to treat (heavy metals, phosphorus, soluble salts, etc.). The charge is calculated as a function of pollution produced during the period of maximum activity on a normal day. In other cases, the charging formula involved can reflect the costs of treating a particular effluent, or the environmental sensitivity of the receiving waters.

Service providers generally receive the proceeds of any industrial effluent charges. This revenue is sometimes channelled into an investment fund that can either allocate the money to water service providers, or to commission wastewater treatment investments directly.



Privatised rain water distribution: "Your bill is 3 billion dollars!" Cartoon published in Charlie-Hebdo in Paris in summer 2003. Riss is a cartoonist for various French newspapers.

Water charge levels have been rising in most OECD countries in recent years. One reason for this is that water quality is often getting worse as a result of over-consumption, especially where groundwater is used. Moreover, government budgets have been stretched to the limit, putting upward pressure on charges. Indeed, there is a demand for more efficient and equitable approaches than across-the-board subsidies for achieving social goals, like affordability.

Expect higher prices

There are other contributing factors, too. There may be past pollution of groundwater that necessitates more sophisticated and more expensive treatment, with a consequent need to develop more expensive demand-management or supply-based regimes. Maintaining and enhancing existing sources can also require more elaborate treatment to deal with new organic pollutants, often from non-point sources. And there may be legislative reasons, with EU directives, for instance, demanding tighter wastewater treatment standards.

As these trends are unlikely to be significantly reversed in the near future, further price increases are in the offing for most OECD countries.

Concern about the affordability of household water services for vulnerable groups, such as low-income households and retired people, has led to the development of a range of policy measures aimed at resolving affordability problems, while still meeting

economic and environmental goals. In general, policies that target specific vulnerable groups – such as through income-related support – have been found to be more efficient at achieving all three objectives than across-the-board subsidies.

As regards "non-public" water services, about half of OECD countries levy some form of general charge on water abstracted outside the public system. In some countries, this charge has an explicit environmental objective, so the proceeds are allocated to an environmental fund. The Netherlands, for example, has two abstraction charges: one levied by the provinces for groundwater protection; and the other levied by the state within the general taxation regime.

For various reasons, some industries are finding that it is more efficient to avoid using the public treatment system to dispose of their effluents, and are developing their own self-treatment and re-use facilities.

General discharge controls are also often imposed on direct wastewater discharges that do not go through public sewers. The proceeds of these charges always go to the government, since there is no service provider involved. For example, a permit is usually required for discharging directly back into a river or aquifer. Some countries reduce these charges on the basis of environmental criteria. For example, there is a 75% reduction in the basic charge in Germany if the environmental standards envisaged by current

regulations (expressed as "best available technique") are maintained.

Subsidy conundrum

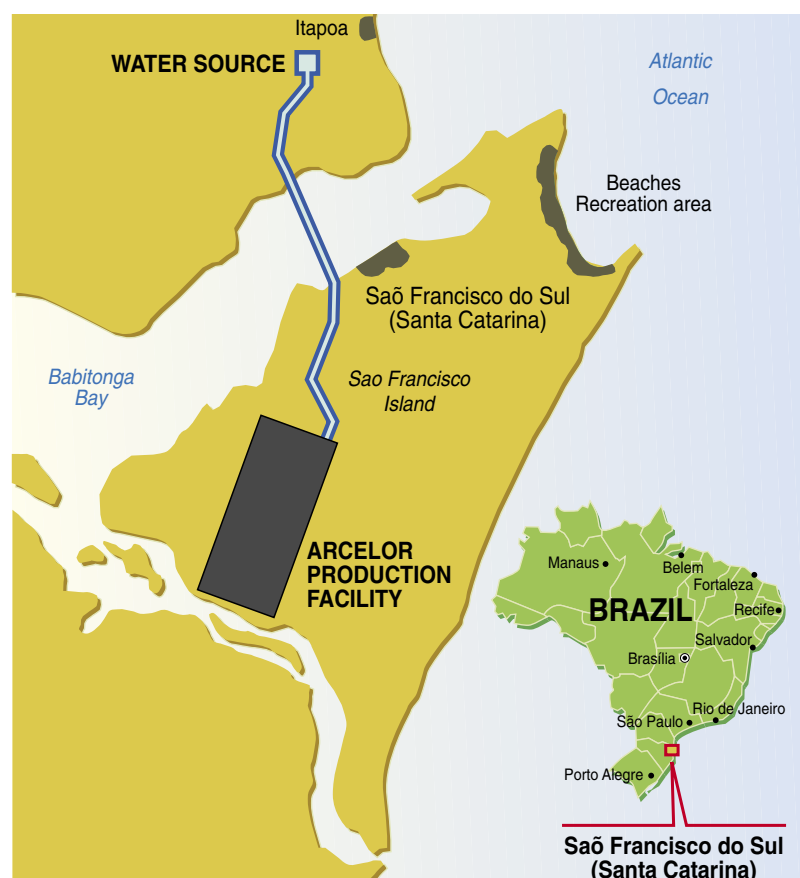
While pricing structures for municipal and industrial water services increasingly reflect the full costs of providing the services, agricultural water use – primarily for irrigation – remains heavily subsidised, which encourages inefficient use of often-scarce resources. Recent OECD reports indicate that industrial and household water users often pay more than 100 times as much as agricultural users, although comparisons of this type are difficult because of the differing water quality needs and conveyance standards of different users. Nevertheless, it is clear that water prices are significantly lower for agriculture than for other user sectors in most OECD countries.

OECD countries are working towards more complete recovery of infrastructure and operating costs from users, although rather slowly. Greater transparency, including in the level of implicit subsidies provided through undercharging for infrastructure use, could help build public support for further reforms.

Tom Jones is the Head of the Global and Structural Policies Division, OECD Environment Directorate. His article *Pricing water* originally appeared in the OECD Observer No 236, March 2003.

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When industry drinks people's water

Christian Caubet

In February 2001 Arcelor, the world's third largest steel producer (2002 sales: \$27bn), announced the construction of a production facility near São Francisco do Sul in the Brazilian state of Santa Catarina. The Vega do Sul plant is now a reality: \$420m has been invested to produce 880,000 tonnes of steel a year, creating 550 direct and indirect jobs. The plant's output is intended mainly for the automotive industry in southern Brazil (Curitiba, Porto Alegre) and for other countries in the Mercosur free trade area.

The Vega do Sul plant was built without considering local needs, although the project's initiators heavily advertised how the project would benefit the region's economic development. The state's authorities signed a contract that breached various legal obligations, notably those regarding the guaranteed distribution of potable water and environmental protection. The way the

plant was located and constructed, and basic operating conditions, ignored the area's real socio-economic and environmental requirements. It was sited on an island with no freshwater supply. Arcelor funded the construction of a water supply pipeline from the mainland, which runs a few hundred metres from a village for which no branch-off has been provided. Local reaction, backed by a number of NGOs, was only considered late in the planning process, and did not have a positive influence.

The plant's location offered Arcelor many advantages: a strategic site for receiving raw materials and delivering products to customers, well-maintained rail and road networks, satisfactory port facilities, skilled local labour, obliging local and state authorities (which granted tax and structural incentives under the pretext of promoting job creation). The plant's construction has already weakened the area's social fabric, generating petty crime

and prostitution and precarious living conditions. Protected natural areas have also been destroyed.

Broken promises

The community has been deprived of important elements of its wellbeing in the name of improving quality of life. For years they were promised that they would be connected to the water distribution network, but they have now lost any chance of seeing the situation improve. Arcelor has taken over water resources that have to be sourced from several springs, thus breaching federal law 9433/97, which gives priority to the people's requirements. The plant's first production tests have already caused toxic leaks. To control the social consequences of the harmful effects of the plant's operation, Arcelor has even ousted the civil representatives from the process to define the local Agenda 21, due to start in November 2004.

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Large-scale manoeuvres around the “Market” for water

“God provided the water, but not the pipes.”

Gérard Mestrallet of Suez
(the world's biggest water company)

Philippe Rekacewicz

No one today dares to claim that water is anything other than “the common property which belongs to the whole of humanity and which should be available to all.” Moreover, this quotation always occupies a prominent position in the presentations of experts, including those who are the most fervent advocates of privatisation of the market for water. To offer a public reminder of this generous principle has the advantage of creating an impressive effect and does not cost a lot. It imparts a clear conscience and opens wide the doors for the legitimising justification of a purely economic treatment of the “merchandise” which is represented by water, as far as its exploitation and the associated costs (of extraction, transportation and distribution) involved. Furthermore, in the context of capitalism, these investments are not only seen as being worthy of reimbursement but are also expected to generate profits.

Water for all

If it is established that water belongs to all human beings – individuals or communal groupings – then the whole world ought to be able to take possession of water and to utilise it according to individual needs. This was certainly possible before the industrial revolution. But today, extreme demographic pressure in certain regions no longer permits the consumption of water without cooperation among the various communities as to the manner of doing so. Water is a fundamental element of the ecosystem, a common patrimony we can withdraw as long as the ecosystem survival is not threatened. During the last three decades, the increase in devastating droughts, the spread of aquiferous pollution, and more and more widespread poverty have led to the emergence across the various continents of the spectre of scarcity. With regard to this situation, the control of water resources has clearly become a major strategic stake sharpening the industrial and financial appetites of the large multinational enterprises in the sector. “The economists are able to quantify the benefits accruing from water,” reminds Aaron Wolf, professor at the University of Oregon in the United States, “and it is generally easier and fairer to portion out its benefits than to distribute water itself. The economists also have the merit of issuing the reminder that it is necessary to derive profits from the costs of the distribution, treatment and storage of water, etc. We are impelled to think of water in market terms, even if this concept has not yet found application at the international level. However, my emotional, aesthetic and religious attachment to water prevents me from considering it as sheer merchandise.”

In other words, the market for water does not yet exist; it remains to be invented. But according to what model?

The one on the basis of which, for example, we have founded the management and distribution of petroleum, and which has benefited – except for extremely rare exceptions – only a handful of the wealthiest private multinationals or the privileged classes in those states possessing petroleum? The dice have not yet been cast nor the bets made, and the international market for water remains embryonic at the moment. Nine-tenths of the fresh water of the planet is still managed by public agencies; this is to say that perspectives are presenting themselves to the developed countries, which, by means of the commercial institutions under their control, are attempting at any cost to open up this gigantic market to the private sector. The World Bank, for example, makes the privatisation of water an obligatory requirement for the granting of financial aid to poor countries. Thus the world is beginning to organise itself, and the actors are starting to take up their positions.

Multinationals sort themselves out

In the first place, it is the large multinationals such as Bechtel, Véolia-Environment or Suez which are putting intense effort into grabbing the juicy contracts for managing water everywhere in the world where countries – of their own will or under duress – are opening their doors. Furthermore, since the Earth Summit in Rio de Janeiro in 1992, major international institutions have busied themselves assiduously with the theme of water and its increasing scarcity, organising dozens of conferences and forums. Alongside these endeavours there have appeared in the course of recent years other far-reaching initiatives, among which are the World Water Council and the Global Water Partnership. They define themselves as “spaces of encounter, of reflection, of discussion and of exchange between private and public partners, civil society, non-governmental organisations and international institutions for improvement in the management of world water resources.” An attentive examination of these hybrid institutions (and especially of the background of their directors) is of such a nature as to leave one quite perplexed. And to raise doubt concerning both their objectives and their representative character – in other words scepticism as to their legitimacy.

World Water Council

Based in Marseille in southern France, the World Water Council (wcc) is an organisation founded in 1996 which brings together 250 members consisting for the most part of institutions from the public and private sectors: multinationals, governments, NGOs, research centres, press organs, foundations, banks and international organisations (in addition EDF – Electricité de France, Mitsubishi Heavy Industry, GAP – Southeastern Anatolia Project, and ICLD – International Commission

on Large Dams). According to the little book distributed by the wcc, all the protagonists of civil society and the major governmental agents are represented to a more or less equivalent degree. And yet its organisational chart and allocation of responsibilities imparts to the wcc a strong resemblance to a lobby which brings industrialists from the sectors of engineering and construction together with their partners at the level of national government and international financial institutions. René Coulomb, co-founder of the wcc and former vice-president of the group Suez-Lyonnaise des Eaux, recently ceded his position as vice-president, to Loïc Fauchon, current president and general director of the Groupe des Eaux de Marseille, a company held in equal parts by Compagnie Générale des Eaux (Véolia ex-Vivendi Environnement) and Suez-Lyonnaise des Eaux (through its subsidiary Ondéo). In other words, the two largest private French companies specialising in this sector. One finds, among others, in the office and on the “board of governors” representatives of the Corps of Engineers of the American Army.

Global Water Partnership

The Global Water Partnership (GWP) is an institution which presents troubling resemblances to its counterpart in Marseille. Founded in Stockholm (Sweden) in 1996, the GWP is directed today by Margaret Catley-Carlson, who also presides over the destinies of the Water Resources Advisory Committee (WRAC), an “independent” committee created by Suez-Lyonnaise des Eaux “in order to accompany it in its reflection upon the high stakes linked to the management of water resources”. The mandate and the objectives are similar to those of the wcc, to the point that one asks oneself why there were created in the same year two organisations which are so similar and, what is more, derive their resources from practically the same donors. The only visible difference seems to be the closer relations which the GWP maintains with governments and agencies of international development.

The World Panel for the Financing of Infrastructures for Water is a joint emanation of the wcc and the GWP which was established after an appeal for funds during the conference in The Hague (Netherlands) in 2000. Intended “to envisage the solutions and financial requirements for getting to the root of the problem of water in the world,” this panel, directed by Michel Camdessus, former general director of the International Monetary Fund (IMF), is composed of nineteen individuals who come from the principal regional banks for development, private and public financial institutions, large multinational corporations from the water sector and only three NGOs. The conclusions of the panel, presented in the Kyoto conference in March 2003, recommend an increase in financial aid and public subsidies (180 billion dollars per year through 2025) that is earmarked for large infrastructure projects initiated in collaboration with

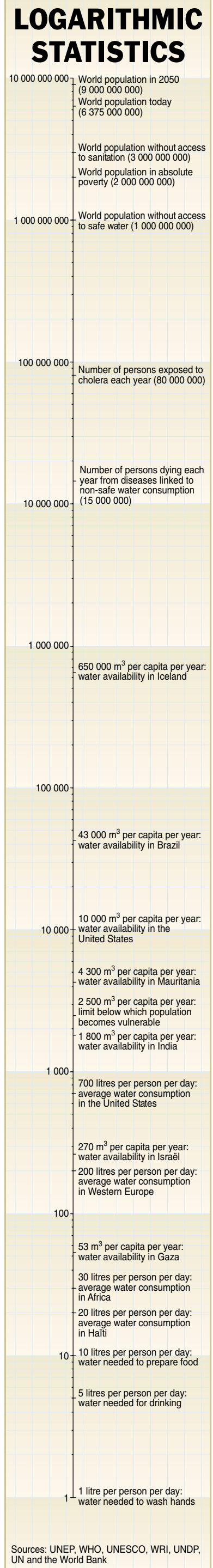
private multinationals (whose investments are to be guaranteed by the public sector).

In addition, the creation of a “world commission for water in the 21st century” whose purpose was to reflect upon and to propose a “long-term vision for finding solutions to the problem of water in the coming century” has been announced during a symposium in Stockholm in August 1998. Certain participants to this commission are also members of the Camdessus panel. The result of deliberations carried out by this commission is the subject of two separate documents known by the name of “World Water Vision”, which during the first world forum on water at Marrakesh in 1997 were proposed to be edited, and which were presented to the public at the conference in The Hague in 2000.

A stable future?

These institutions, these forums and these reports constitute the promotion of a vision which is radically oriented towards the undertaking of grand tasks broadly supported by the interests of powerful private industrial groups, by means of presenting this vision as the only possible solution for assuring “a stable future.” The adherents to this vision assert to whomever wishes to listen that they speak in the name of everyone, that they represent the majority and consensus, under the pretext that the processes of decision-making and joint planning within their organisations are open and transparent. Actual practice demonstrates that they are neither the one nor the other. A few sole “decision-makers,” have appropriated for themselves the key positions in these organisations which offer them an unequalled visibility in the media and throughout various institutions, and which in effect take any possibility for communication away from the NGOs (noticeably absent) and those organisations which are truly independent of the economical and political powers (even some UN agencies are under-represented). And yet they could contribute amply to the “reflections” of which these institutions are all so fond. Unfortunately other international initiatives, like the World Water Contract (led by Ricardo Petrella, an advisor to the European Commission), have been sidelined.

Water for free or water at a price, private water or public water, dams or no dams? Such are the significant debates which inflame the relations between the protagonists who seek solutions for the future. The third world forum on water, which was held in Kyoto in March 2003, was a major event for the large industrial lobbies and their political extensions. The NGOs in attendance were only rarely invited to speak and were systematically shunted aside during the principle debates and declarations, especially if they attempted to convince the planet that salvation would not necessarily come from private-public partnership and from the completion of large-scale hydraulic projects. The World Water Council, co-organiser and initiator of the forum, describing itself as a “representative of civil society,” presented during the course of the ministerial conference a declaration which curiously didn't say enough about water as a fundamental human right. But what is most surprising of all is a detail from the report presented by the Camdessus panel, a fact concerning which the authors maintained discretion. In the distribution of the hoped-for financial investments (180 billion dollars per year), only 75 billion are intended for the provision of drinking water for the general population, and as for the rest – 105 billion dollars per year – one third only is devoted to agriculture, and the other two thirds are reserved especially for industry. Just a tiny detail.





American stamp 1999 Women's Rights Movement

Nature, Wealth & Power is the title of a recent publication by USAID and others, based on 20 years of natural resource-based development in rural Africa. The authors conclude that environmental sustainability, economic growth, and governance are interdependent conditions for development. We agree, and have dedicated these pages to showing how good governance of resources is in turn dependent on effective participation of local and indigenous groups in decision-making.

The role of women in managing natural resources affords them special priority as "agents of change" but it also renders them more vulnerable to environmental pollution and change – as described in more detail by Carlyn Hambuba. In particular women have a critical role to play in management of water, and the article by Mildred Mkandla is a positive account of how empowering women has uplifted the community through using environmentally sensitive technologies.

Indigenous and pastoralist groups are often marginalised or not represented in local or regional authorities, and are vulnerable to environmental and social changes. But the knowledge and the environmental assets of these groups should be seen as a source of wealth, in a system parallel to the monetary economy. The articles on the Inuit and the Kenyan pastoralists show how traditional livelihoods have been impacted in the past, and will be impacted in the future, and what needs to be done to preserve the wealth of knowledge, and to perpetuate some of the most effective and innovative environmental management practices.

But still much more needs to be done; opportunities for education are still heavily biased against girls, and women and indigenous groups continue to be marginalised from decision-making at local and global scales. Development partnerships that are guided by expressed needs and implemented by the expected beneficiaries, should be encouraged and facilitated by appropriate tenure, trade, and fiscal reforms.

A woman's worth

Carlyn Hambuba

In many parts of the world, especially developing countries women have a primary responsibility for ensuring sufficient resources to meet their families' needs. In the rural areas, women manage essential household resources like clean water, fuel for cooking and heating and fodder for domestic animals.

Women are usually disproportionately affected by environmental degradation because they tend to be more dependent on natural resources in order to carry out their productive activities. In most households in developing countries, for example, women are primarily responsible for growing crops, tending livestock, gathering fuel, and collecting and using water. Degraded environments threaten women's health, directly and indirectly, and also mean that women must spend more time and effort to find fuel or produce food, for meeting household needs. Poverty adds a further dimension to this relationship, because poor women are unable to afford preventative or curative healthcare services.

Toxic chemicals and pesticides in air, water and earth are responsible for a variety of women's health risks. In China's Gansu province, for example, discharges from a state-run fertiliser factory have been linked to a high number of stillbirths and miscarriages. Water pollution in three Russian rivers is a factor in the doubling of bladder and

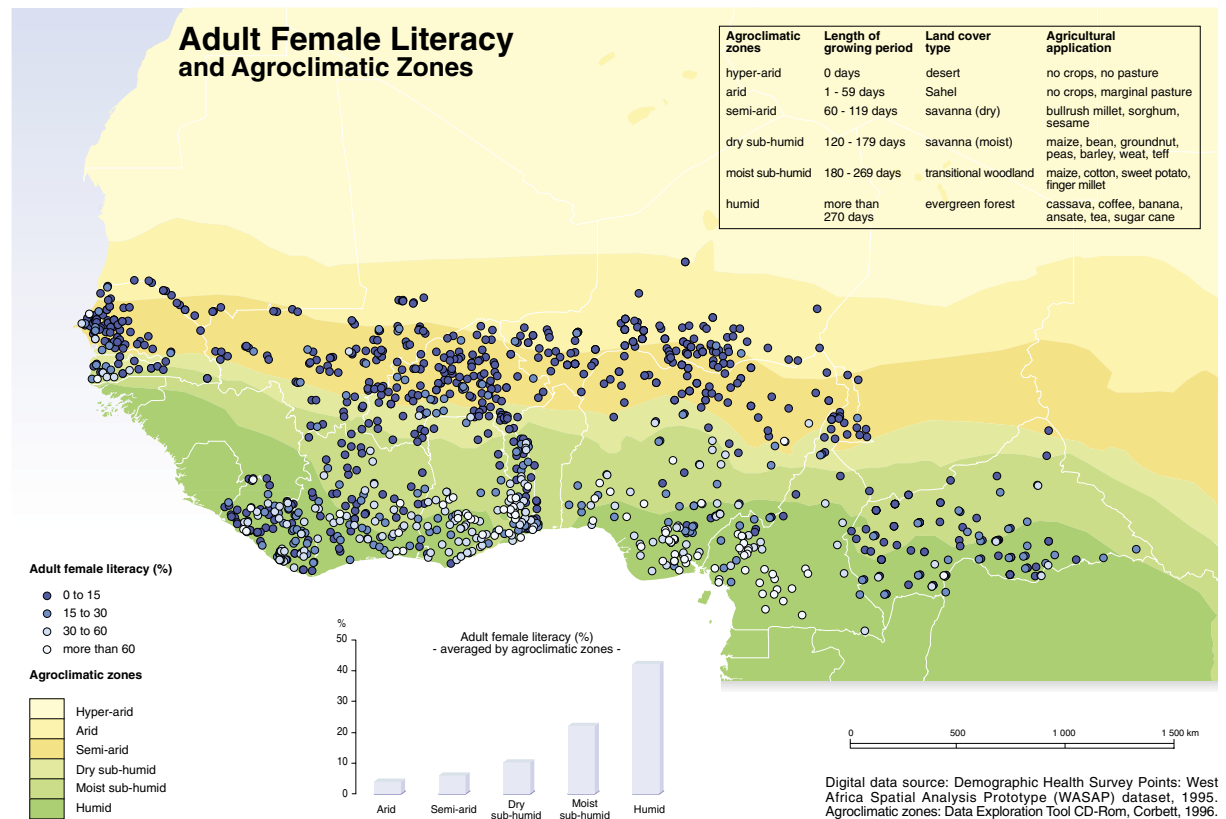
kidney disorders in pregnant women, while in Sudan a link has been established between exposure to pesticides and peri-natal mortality with the risk higher among women farmers¹.

Agents of change

But women also benefit from their unique connection with the environment. Women can be targeted in environmental campaigns to influence behaviour and to change attitudes. If women are aware of environmental issues, they are more likely to influence the attitudes of their children, family members and community.

However, one difficulty in targeting women is that they often spend less time than men watching TV, listening to the radio and reading newspapers. In addition, in many areas education of women is marginalized for cultural or economic reasons, resulting in lower literacy rates among women. For example, a study in the Mekong Delta showed that only 20% of women ever engaged in these activities.

Nonetheless, in some Asian countries there are examples of women being empowered at the community level to identify the environmental problems which relate to their daily lives and to solve problems in areas such as water, sanitation, waste management, composting and forestry². Empowering women has helped raise consciousness in environmental issues, as well as about their needs, rights and capabilities in society. Giving women access to



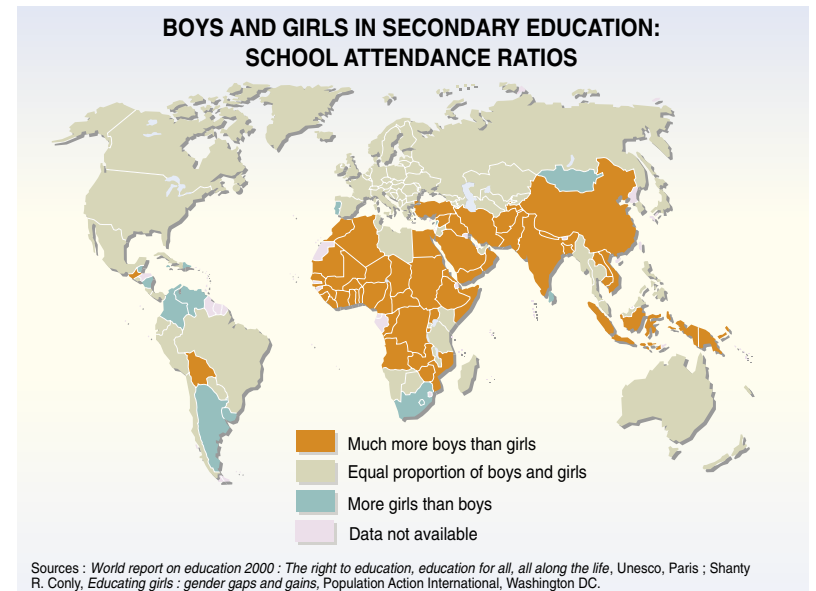
resources and services, and improved farm productivity has ultimately empowered women economically through higher profits.

Leading the way

Women themselves are often leading the way in finding solutions to local environmental problems and securing their own livelihoods. In India, women are heading rural movements to promote sustainable farming practices and resist large-scale agricultural operations whose intensive use of chemical fertilisers and pesticides, can harm the environment and health³.

In western Kenya a programme called Rural Stove has trained 50 women in production and marketing of Maendeleo fuel stoves, which have low fuel-wood consumption, thus reducing deforestation. This has created employment for women and also improved the quality of life of those using the stoves by making fuel cheaper and saving time⁴.

In Dar es Salaam, Tanzania, Kiota Women's Health and Development Organisation, a community environmental health project, is promoting economic empowerment for women using solid waste management. Public health and environmental education is targeting women to combat and prevent communicable diseases such as cholera, malaria, typhoid, diarrhoea and tuberculosis. In addition, about 360 women have been trained in solid waste collection and marketing. Women are now collecting different types of solid waste such as empty bottles, papers, metal, and plastics, which are sorted and packed for marketing. Based on an estimated per capita waste production of 1,045



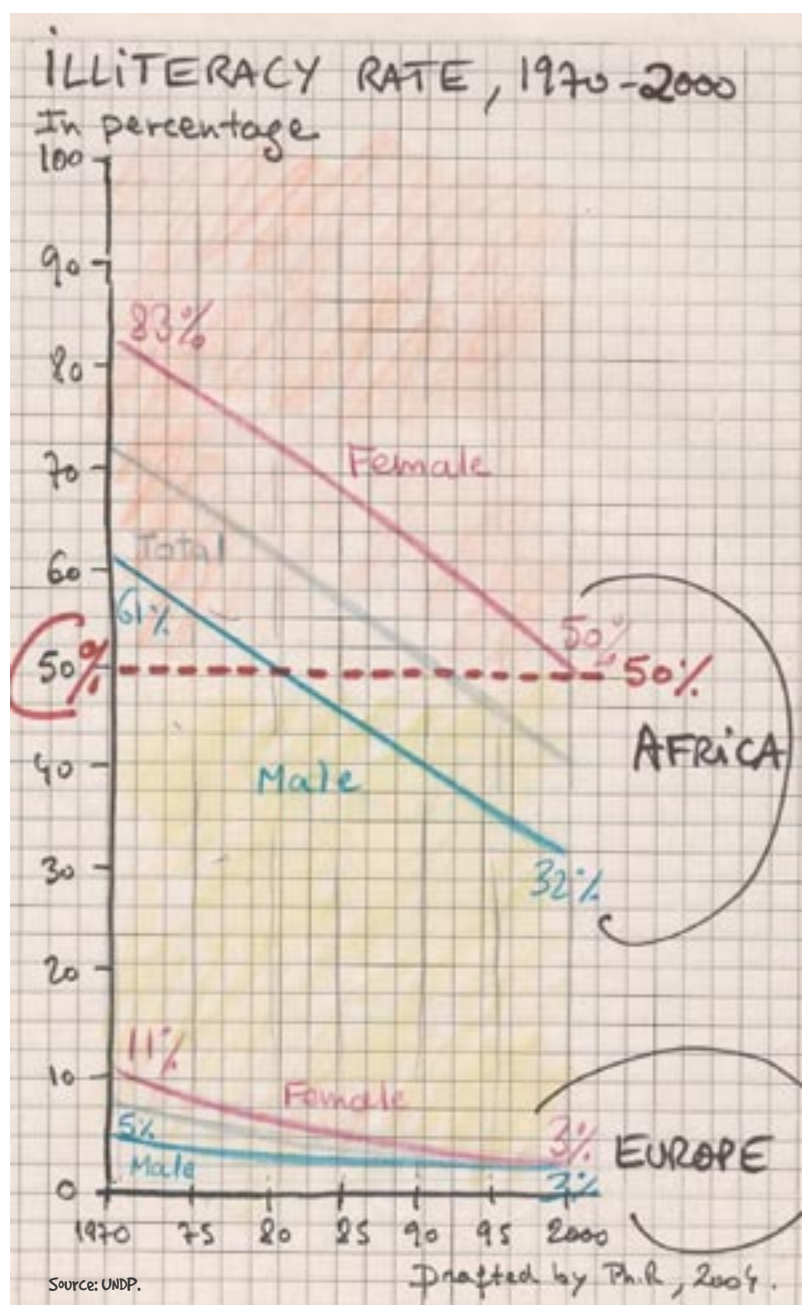
tonnes of solid waste per day, this constitutes a huge business opportunity for these women, whilst delivering environmental benefits as well⁵.

The root causes of persistent poverty and food insecurity among rural women and the families in many countries are due to lack of empowerment of women and sustainability. Empowering women can enhance the status of rural women in achieving food security, poverty alleviation and sustainable development. This has been recognised by international organisations including the United Nations Development Programme (UNDP) as priorities for sustainable development. In his keynote address to the International Women's Health Coalition Annual Gala in January 2004, UN Secretary General Kofi Annan said "The greatest weapon in the war against poverty is the empowerment of women and the education of

girls. When women are fully involved, the benefits can be seen immediately: families are healthier; they are better fed; their income, savings and investment go up."⁵

Carlyn Hambuba is a freelance journalist who specialises in women's issues and environmental issues. She writes for the Women's News, The Green Times and also presents Environment programmes on UNZA radio.

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Chinese stamp 1990 Eliminate illiteracy



Greek stamp 1977 Nature protection



Greek stamp 1977 Nature protection

The role of culture and knowledge in livelihood security

"The paradox and crisis of development arise from the mistaken identification of culturally perceived poverty with real material poverty, and the mistaken identification of the growth of commodity production as providing better sustenance. In actual fact, there is less water, less fertile soil, less genetic wealth as a result of the development process."

Vandana Shiva, 1992

D. L. Manziolillo Nightingale

Most approaches to measuring poverty use yardsticks that are meaningful from a traditional view of development, such as income or access to schools and hospitals. These have met with criticism because they fail to take into account livelihoods that operate outside monetary systems and alternative indicators of well-being. Additional techniques have been devised for use in these situations, and as a result, studies where "poverty" is measured using different approaches yield different populations of "poor" people (Laderchi *et al.*, 2003).

By the same token, wealth can be found in natural resources, and the knowledge that people use to manage them. In the case of subsistence pastoralism, the management of traditional livestock breeds and the use of locally available natural resources can be seen as a form of wealth. For example pastoralists can optimise livestock productivity by using the best grazing areas available at any one time, and minimising the loss of livestock to predation, raiding, diseases and climate variability, especially droughts. They also use environmental and behavioural knowledge to assess rangeland and livestock condition, to decide where and when to settle, and when to provide supplementary feeds and minerals, all of which are important influences in livestock and rangeland productivity (Ole Lengisugi and Mziray 1996, Geerlings *et al.*, 2002, Western and Manziolillo Nightingale 2003). Pastoralists also use their wealth of ethnoveterinary knowledge to optimise animal health (Ole Lengisugi and Mziray 1996).

Livestock owners can also control the genetic composition of the herd through selective breeding to achieve certain goals, including increasing efficiency of milk and meat production under highly seasonal or drought conditions, or the ability to subsist on poor quality fodder and little water (Western and Manziolillo Nightingale 2003). Other traits that can be maximised include colour, domesticity, mothering instincts, herdability, disease resistance or ability to walk long distances.

Traditional livestock breeds, animal husbandry and the management of natural resources based on detailed ecological knowledge are all part of a set of survival strategies for subsistence pastoralists. Unfortunately, traditional livestock breeds are being lost through cross breeding with exotic animals and through development policies that promote different breeds and livestock products. The alienation and subdivision of land for conversion to agriculture, urban areas, or national parks has resulted in loss of grazing areas for livestock. The demand for timber, fuel wood and charcoal, and agricultural expansion has also caused the loss of many valuable medicinal plants. The result is a loss in coping capacity for livestock owners, their confinement to even more marginal areas, loss of livestock numbers, and the impoverishment of those pastoralists who are not able to successfully adopt alternative livelihoods.

With the loss of their assets, pastoralists are at risk of greater vulnerability and insecurity. Many pastoral communities that once could have been considered well off in terms of access, control and management of natural resources were declared "poor" according to a set of externally derived standards. As a result of well meaning interventions, some of them have ended up being "poor" by any standards.

However, traditional management systems and resources could provide opportunities for improvement of livelihoods of many people in pastoral areas, and should be seen as ways of promoting security and generating benefits. Traditional forms of livestock husbandry can be combined with tourism, hunting and harvesting of timber and other products from woodland areas and forests to preserve both the natural resources and the traditional livelihoods they support. A new development paradigm should be based on the following points:

- Flexibility is key to successful management, as well as efficient tracking to take advantage of opportunities provided by resources, as and when they become available.
- In production and marketing, switch from a "beef" or "meat" oriented paradigm, to one which has a broader set of objectives defined in

collaboration with the community in question.

- Protect user rights and access to key resources needed at different times of the year.
- Boost institutions at the local level to help communities maintain access to resources, and equitable distribution of benefits. These can be a combination of old (traditional), and new institutions.
- Improve the monitoring of local environmental conditions through collaboration between community members and scientists.
- Come up with ways of diversifying opportunities for pastoralists, both on and off the land. For opportunities on the land, promote those that are compatible with pastoralism.
- With respect to indigenous livestock breeds: promote documentation, genetic impact assessments, evaluation of economic prospects in their use, protection of intellectual property rights, and the equitable distribution of benefits derived from this property.
- With respect to traditional forms of veterinary knowledge and practices: promote understanding and documentation of important (and useful) local medicinal practices and plants, evaluation and protection of medicinal and economic benefits, for communities that have developed and used the knowledge.
- Ensure benefit sharing from other natural resources on which a community depends.

Deborah Nightingale is an anthropologist and environmental management consultant based in Kenya. She has been a contributor to the Africa Environment Outlook Report, published by UNEP.

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Harvesting rainwater yields better status for women

Mildred Mkandla

Water shortages are common in both urban and rural areas of many developing countries. Rainfall fluctuations and frequent droughts together with poor water storage facilities mean that water supply is erratic, and much water is wasted through illegal connections and leakages. Poorer communities suffer most, by frequently receiving water that is not of potable quality and by paying a higher price for it. Rainwater harvesting can provide communities with greater water security, by collecting rainwater and storing it for use in the dry season. Techniques include:

- **Rooftop catchment** – covering the roofs of huts and animal shelters with iron, plastic, thatch, reeds or mud and channelling rainwater into storage tanks through gutters.
- **Ground catchment** – construction of an earth dam or pan.
- **Rock catchment** – collecting run off from rocky areas and channelling the water into storage tanks.
- **Construction of sand dams** – a concrete wall is built across a river in a rocky area. Water collects in the sand and evaporation is reduced.

Women play a key role in local water management – they have considerable knowledge of water sources, availability, quality, and conservation techniques. It is women who carry the burden of water collection, and who perform most water-related activities (bathing children, cooking, tending crops, watering livestock and washing clothes). Water management schemes in the past that have excluded women, or that have not empowered women to actively participate, have often failed. Reasons for this include cultural dictates, lack of awareness on the part of authorities and development agencies, and lack of communication skills and confidence on the part of the women in the community to express their needs.

In a pilot project carried out in several urban and rural areas in Kenya, the women have been given an opportunity to articulate their ideas and use their knowledge in the formulation of meaningful and appropriate policies. The women have been involved

in construction, management, operation, and maintenance of rainwater harvesting and sanitation facilities. A participatory method was used, which included workshops, demonstrations, role play, exchange visits, video shows, and open discussions in small and large groups. The first step was to assess the communities' priorities, which included protection of water wells, prevention of diarrhoeal disease arising from contaminated water, water scarcity, poverty, and heavy workload of women. This was followed by an inventory of the existing water facilities, awareness raising, planning, training and empowerment, and construction.

In Kajiado district, one of the beneficiary communities, 700 people now have greater year-round water security. The water supplies are owned by the community, and managed by a water council. Proceeds from the sale of women's beadwork are used for maintenance and upgrading of dwellings.

Agnes Kimer from Kajiado, speaking at the Pan African Partnership and Implementation Conference of Water in December 2003 explained how she took part in the design and construction of the project. "We chose rooftop catchments and ferro-cement tanks as they would be easiest to maintain. We fitted the manyattas (traditional houses made of mud and thatch) with plastic roofing and guttering ourselves." "At first I did not want to participate, but now my husband respects me much more because he sees what I have done for the community" she added. Agnes spends less time collecting water and now grows beans and vegetables for sale in the local market.

Mildred Mkandla is External Relations Director of EarthCare Africa Monitoring Institute, based in Addis Ababa, Ethiopia. A development activist for 35 years, she coordinated the Pilot Project on Empowering Women in Rainwater Harvesting in Kenya. The project was implemented on behalf of the United Nations Environment Programme by EarthCare Africa Monitoring Institute, with funding from the Government of Sweden.

Greenlandic stamp 1938
Polar bear



Canadian stamp 1995
The Arctic



A changing climate threatens the Inuit

**GRID-Arendal and ICC
(Inuit Circumpolar Conference)**

A number of life altering changes has happened over the last years to Inuit societies. Changes explained only by the changes in weather patterns. The 155,000 Inuit in northern Canada, Alaska, Greenland and Chukotka in the far east of Russia have suddenly – in terms of nature's time scales – been forced to reconsider their traditional life styles. Ways of life that have allowed the Inuit to survive for hundreds of years in what is for most people a harsh environment are now threatened by changes induced by humans far south of the areas where the Inuit live. "The human rights of the Inuit to decide their own life style and habitat have been threatened as a cause of these changes in nature," says Sheila Watt-Cloutier, elected Chair of the Inuit Circumpolar Conference (ICC), representing the rights of the Inuit.

"Talk to hunters across the North and they will tell you the same story, the weather is increasingly unpredictable. The look and feel of the land is different. The sea-ice is changing. Hunters are having difficulty navigating and travelling safely. We have even lost experienced hunters through the ice in areas that, traditionally, were safe. The melting of our glaciers in summer is now such that it is dangerous for us to get to many of our traditional hunting and harvesting places," says Watt-Cloutier.

"For generations uncounted, Inuit have observed the environment and have accurately predicted the weather enabling them to travel safely on the sea-ice and hunt seals, whales, walrus, and polar bears. Inuit do not hunt for sport or recreation. Hunters put food on the table. People further south on the globe go to the supermarket, Inuit go on the sea-ice. Eating what Inuit hunt is at the very core

of what it means to be Inuit. When they can no longer hunt what is on the sea-ice their entire existence as a people is threatened," Watt-Cloutier points out.

The ICC has collected documentation from different Inuit communities that all tell the same story of changes to their environment. The residents of Sachs Harbour, a tiny community in the Canadian Beaufort Sea region, have reported that melting permafrost cause beach slumping and increased erosion. They see increased snowfall, longer sea-ice free seasons, and have observed new species of fish and birds like the barn owl, robins, pin-tailed ducks and salmon. They have also had an invasion of mosquitoes and black flies. Alaskan Inuit report that their natural ice cellars in which they store food are melting.

"Plans are well under way to relocate certain communities if need be. Climate

change is not just a theory to us in the Arctic, it is a stark and dangerous reality. Human-induced climate change is undermining the ecosystem upon which Inuit depend for their cultural survival. The Arctic is not wilderness or a frontier, it is our home," says Watt-Cloutier.

The eight Arctic states; Denmark, Norway, Sweden, Iceland, Finland, Canada, Russia and the US account for 40 percent of the world's greenhouse gas emissions; the gases believed to be provoking climate change. In several international forums discussions and negotiations about reducing greenhouse gas emissions are taking place. One of these forums is the Convention of the Parties under the Kyoto Protocol, established by the United Nations Convention on Climate Change to curb climate change.

A year ago the Governing Council of the United Nations Environment Pro-

gramme (UNEP) passed a resolution calling for increased environmental monitoring in the Arctic. This decision was also based on the increasing amount of international research suggesting that what happens in the Arctic will later happen in the rest of the world. You can, so to speak, take the pulse of the world in the Arctic.

"Responding to climate change has split the nations of the world. Our plight shows the compelling case for global unity and clarity of purpose to forestall a future that is not ordained. These dramatic changes to our environment and our climate will bring about the end of the Inuit culture," says Watt-Cloutier.

The Inuit Circumpolar Conference represents the Inuit, the Arctic people living in Alaska, Canada, Greenland and Russia. The ICC holds consultative status to the UN Economic and Social Council and is involved in many areas of various international forums. www.inuitcircumpolar.com.

Policy puzzle

“The water crisis is essentially a crisis of governance.”

Water for People, Water for Life. The United Nations World Water Development Report, UNESCO 2003

Here again we have branched out from our regular style, in order to retain the reader's interest. The point is that none of the foregoing is useful information unless it is put into a policy context and used to improve the lives of the poor and to sustain environmental goods and services.

So we hope you will indulge in a little “audience participation” and help us to complete our policy puzzle (fill in the missing “solutions” and implement them through the channels open to you).



“Most of the solutions are neither complex nor expensive to achieve but will nonetheless require major policy shifts by governments to implement. The potential benefits are so great that the political will to introduce new policies must be found.” (1)

“The State shall protect water resources and adopt effective measures to preserve natural flora, plant trees and grow grass, conserve water sources, control water and soil losses and improve the ecological environment.” (2)

“Rather than dishing out blanket subsidies to hold down water tariffs, a policy that usually benefits the middle classes most, Chile charges everybody the full cost of their water, but gives poor people stamps to redeem against their bills.” (3)

“Recycling could reduce the consumption of many industrial consumers by 50% or more, with the additional benefit of reduced pollution.” (5)

“Sanitation and education for girls are closely linked, as their school attendance requires separate sanitation facilities.” (4)

1. *Water for People, Water for Life. The United Nations World Water Development Report, UNESCO 2003*

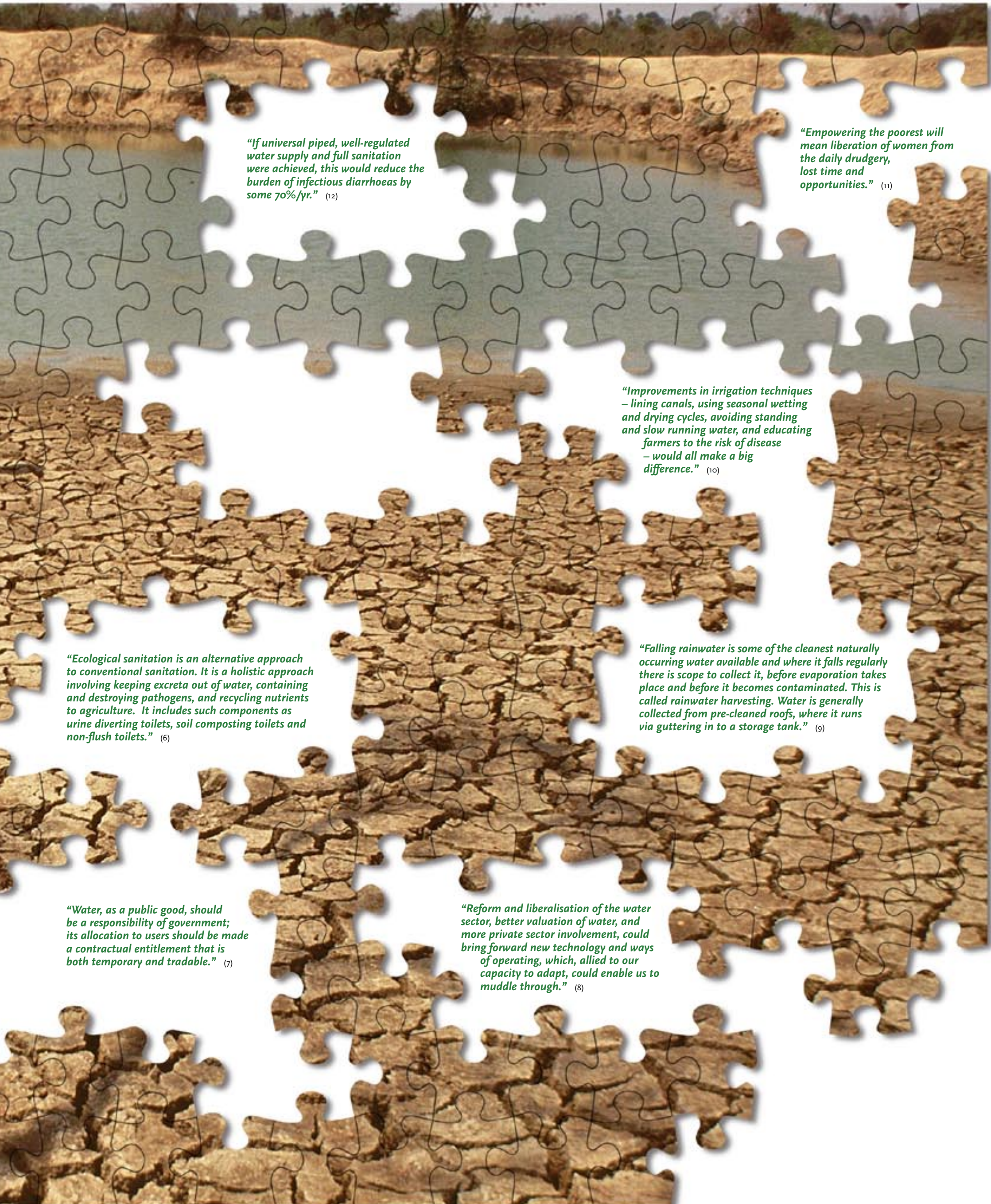
2. 1988 Water Law of the People's Republic of China (article 5)

3. The Economist July 17th 2003; Special Report on Water

4. Jan Pronk, Chairman of the International Water Academy, chairing the *Water for the Poorest* conference, Stavanger, Norway, 4-5 November 2003

5. The Dublin Statement On Water And Sustainable Development delivered at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992

6. UNEP Background Paper on Water, Sanitation and Human Settlements presented by the Executive Director at the Global Ministerial Environment Forum, Korea, March 2004



“If universal piped, well-regulated water supply and full sanitation were achieved, this would reduce the burden of infectious diarrhoeas by some 70%/yr.” (12)

“Empowering the poorest will mean liberation of women from the daily drudgery, lost time and opportunities.” (11)

“Improvements in irrigation techniques – lining canals, using seasonal wetting and drying cycles, avoiding standing and slow running water, and educating farmers to the risk of disease – would all make a big difference.” (10)

“Ecological sanitation is an alternative approach to conventional sanitation. It is a holistic approach involving keeping excreta out of water, containing and destroying pathogens, and recycling nutrients to agriculture. It includes such components as urine diverting toilets, soil composting toilets and non-flush toilets.” (6)

“Falling rainwater is some of the cleanest naturally occurring water available and where it falls regularly there is scope to collect it, before evaporation takes place and before it becomes contaminated. This is called rainwater harvesting. Water is generally collected from pre-cleaned roofs, where it runs via guttering in to a storage tank.” (9)

“Water, as a public good, should be a responsibility of government; its allocation to users should be made a contractual entitlement that is both temporary and tradable.” (7)

“Reform and liberalisation of the water sector, better valuation of water, and more private sector involvement, could bring forward new technology and ways of operating, which, allied to our capacity to adapt, could enable us to muddle through.” (8)

7. The Economist July 17th 2003; Special Report on Water

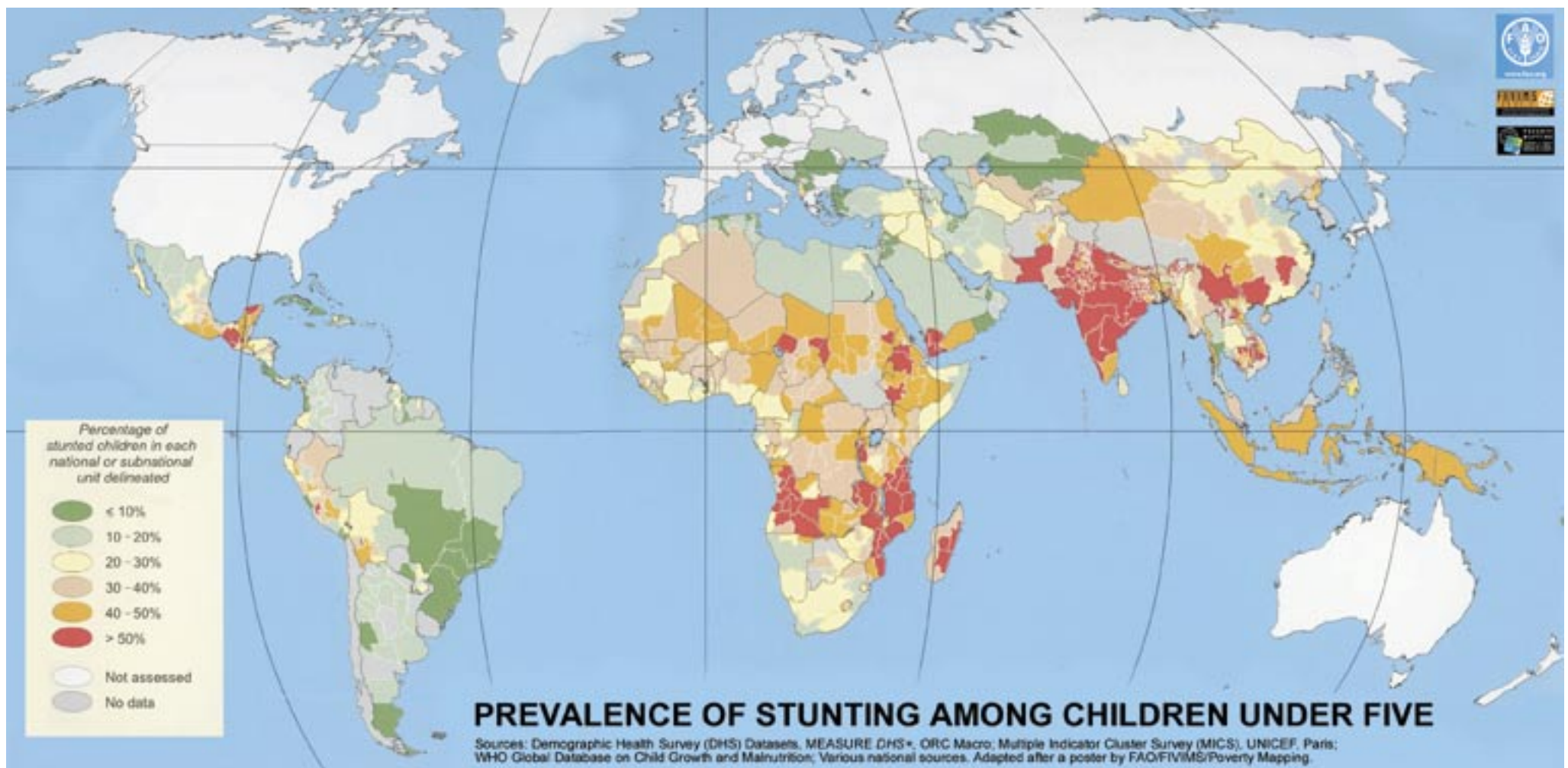
8. *Water for People, Water for Life.* The United Nations World Water Development Report, UNESCO 2003

9. WaterAid www.wateraid.org.uk

10. *Water for People, Water for Life.* The United Nations World Water Development Report, UNESCO 2003

11. Jan Pronk, Chairman of the International Water Academy, chairing the *Water for the Poorest* conference, Stavanger, Norway, 4-5 November 2003

12. *Water for People, Water for Life.* The United Nations World Water Development Report, UNESCO 2003



This map is a product of the FAO/CGIAR/UNEP project on poverty and food security mapping. The project aims to analyse the spatial dimension of poverty and food insecurity with a view to improving planning and targeting of poor areas in agricultural development projects. More information, reports and maps are available on www.poverty-map.net

Rich map, poor map

W. Conard Holton

The fact that poverty and environmental health are related is widely understood but often difficult to quantify. Recognising this, researchers, activists, and policy makers are beginning to combine “poverty maps” that locate the poor, with maps that identify environmental conditions, creating a tool that helps guide policy decisions and remedial actions. For example, a region’s highway infrastructure, forest cover, building locations, airborne toxins, and infant mortality can be displayed, manipulated, and analysed for a particular time period.

Poverty mapping with GIS is being sponsored by governmental and non-governmental organisations (NGOs) on every continent. To promote the use of poverty maps, particularly in the areas of food security and environmental management, the government of Norway has funded the Poverty Mapping initiative (www.poverty-map.net), run by the Food and Agriculture Organization of the UN (Rome, Italy), the UN Environment Programme (UNEP)/Global Resource Information Database (GRID)-Arendal (Norway), and the International Center for Tropical Agriculture CIAT (Cali, Colombia). Similarly, the World Bank has sponsored the creation of numerous national and regional poverty maps as policy tools.

The most useful maps show poverty at a district or community level, rather than on a national scale. These higher-resolution maps can reveal poor regions and communities that may dis-

appear among wealthier areas at lower resolution. Higher-resolution maps can more closely tie population to specific spatial information like roads, health clinics, and factories.

Still, no methodology has been standardised to produce poverty maps, and there are tradeoffs and limitations with each technique. The so-called “small-area estimation method” combines census and household survey data. Another method combines census data with composite indices of poverty indicators. For example, the Human Development Index was created by the UN Development Programme and compiles the poverty indicators of life expectancy, education, and income for each country.

“These maps have the potential to greatly influence public decisions or to make the decisions more transparent,” says Norbert Henninger, deputy director of the Information Programme at the World Resources Institute. “When maps get in the public domain, you can raise public awareness – it becomes crystal clear when you see on a map that resources aren’t going into poor neighborhoods.”

Maps can be tools to link poverty and environmental health in developed countries as well. The environmental justice movement has focused attention in the US and Europe on adverse health effects associated with pollution-intensive industries and hazardous-waste sites in low-income and minority communities. The movement was sparked in the US by a 1987

study by the United Church of Christ, which concluded that hazardous waste sites were disproportionately located in minority neighborhoods.

“That study was really the first national study, and it laid out the framework for examining the issues,” says Robert Bullard, director of the Environmental Justice Resource Center at Clark Atlanta University. “When you map out the environmental characteristics of a place and the population, you can dispel a lot of misinformation about disparities.” He says that poverty mapping is still in its infancy, but it is helping advance the concept of environmental justice into international discussions on development, trade, and human rights. He is concerned that after September 11, security issues have made it harder to get important information on infrastructure such as pipelines, factories, and power plants.

In the UK, the Environment Agency has recently published a research report from Staffordshire University and The University of Leeds showing that the poorest communities bear the greatest burden of poor air quality. In addition, pollution sources are seven times more likely to be located in the poorest communities. According to Simon Bullock, environmental justice research officer at Friends of the Earth, this research is one result of a map created in 1998 by his organisation linking the location of polluting factories in England and Wales to average income by postal code. “This new report is promising because there has been a real lack of relevant academic research in the UK,” says Bullock.

Bullock notes that the fact that poor people live in poor conditions is considered “common knowledge” in the UK, and so had attracted little interest in the press or research. “Since the prevailing winds come from the west, the rich have always lived on the west side of cities and the poor on the east,” he says. “At one point, the environmentalists were attacked as pushing policies that would hurt the poor, such as raising gasoline prices. Now our tactics have shifted to relating environmental issues to poverty, and maps have played an important role in making the case.” Bullock says that even Prime Minister Tony Blair has changed his rhetoric to declare that local environmental problems hit the poor the hardest.

In the broader struggle to improve the quality of life worldwide, poverty maps are being developed to help achieve the Millennium Development Goals adopted by the United Nations member states in September 2000: eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria, and other diseases; ensure environmental sustainability; and develop a global partnership for development.

“We’re taking a global perspective, rather than one country at a time,” says Marc Levy, associate director for science applications at the Earth Institute of Columbia University’s Center for International Earth Science Information Network, who is monitoring progress

towards the goals. “Mapping will allow us to characterise the distribution of the world’s poor. The Goals were set in a vacuum, and now we must identify where and in what conditions people live – is it dry, wet, urban, rural, what are the soil conditions? This information is valuable for understanding the poverty drivers and what interventions might help.” A significant challenge for Levy will be finding comparable measures in different countries. Income, for example, is very difficult to compare because purchasing power varies between regions and exchange rates fluctuate, so it’s better to focus on mapping outcomes of poverty such as food consumption.

Anna Ballance, programme officer for capacity building at UNEP/GRID-Arendal, is coordinating the Poverty Mapping project. She says, “The priority is to expand poverty mapping methodologies to be able to combine socio-economic variables with environmental indicators. This will let us look for causal relationships or synergies that could be used to improve planning and development.” Ballance would also like to see greater comparability between poverty mapping techniques in different countries and at different scales. The wide range of indicators of income and well-being in use impedes comparison between countries and thus allocation of priorities.

W. Conard Holton is a freelance writer from New York. He specialises in scientific articles, particularly in the environment and health field. This article is summarised from the original, printed in the February 2004 edition of *Environmental Health Perspectives*. www.ehponline.org

Swedish children discuss water stress

Elisabet Idermark

How do you discuss water stress with children spoiled with never-ending clean water? What do they care about an International Year of Freshwater?

They do care, says Camilla Nilsson, science centre educationalist in Kalmar, Sweden, who spent all of 2003 exploring freshwater issues with Swedish school children aged 6-15. “We have heard the most innovative ideas on water conservation and management during our sessions with the children” she added.

Camilla and her colleagues at XL, a university science centre in Kalmar, set up a programme on freshwater in collaboration with GIWA, Global International Waters Assessment, a UNEP project on the environmental conditions in transboundary waters. School classes were invited to make experiments with

water in the XL laboratories. They were expected to discuss water issues before coming there and were also given exercises to continue working on in the classroom after the visit.

Many teachers took this opportunity to make an interdisciplinary project on water, says Camilla Nilsson. The children have written poems, read novels and designed flags along with the more scientific studies of water.

Marie-Louise Yllenus is head teacher in fifth grade in Torslunda school on the island Öland in the Baltic Sea. She describes how her school opened the water project with a surprise event. “We asked 100 students to stand in a circle, each holding a glass of water. They were asked to taste the water in the glasses. Only three of them were filled with drinkable freshwater, all the others were very salty”. This led the

Torslunda fifth graders into a discussion on the world’s uneven distribution of drinking water.

“The younger children tried to come up with ideas on how to share the Swedish abundance of water” says Camilla Nilsson at XL. “One suggestion was to use salt water for toilets, another was to always take showers and never use bathtubs. The older children understand that what is to be shared is knowledge and that they in the future must get involved in technical development also in other countries.”

Elisabet Idermark is the Information Officer at the Global International Waters Assessment (GIWA). The objective of GIWA is to produce a comprehensive and systematic assessment of the environmental conditions and problems in transboundary waters, to develop scenarios of future conditions, and to present policy options. GIWA is a project funded by the Global Environmental Facility (GEF) and led by the United Nations Environment Programme (UNEP).



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