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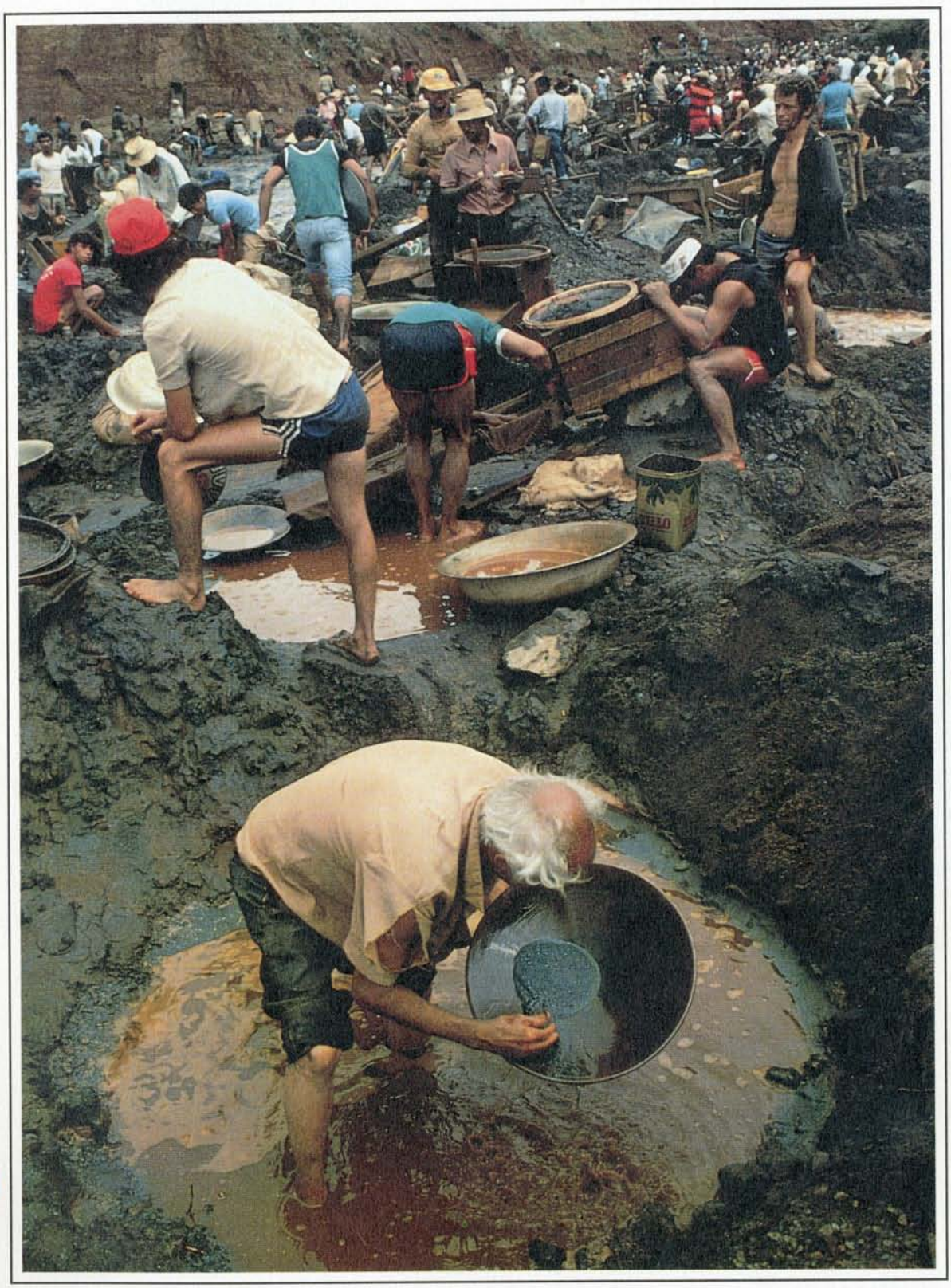

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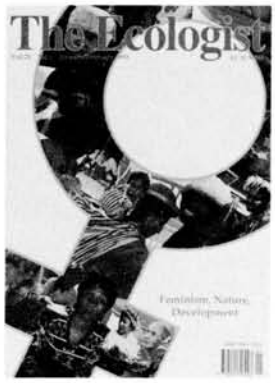

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Editorials

Feature Articles

Cover photo: Gold prospectors, near Itabira, Brazil. (Sebastiao Salgado/Magnum)

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The New Protectionism

Whatever the question — the recession, regional decline, unemployment, Third World poverty or Eastern European crises — Western ideologues are giving the same answer: free trade. The fewer the barriers to trade, it is asserted, the greater will be the increase in efficiency and wealth, some of which may even trickle down to the bottom of the world's social pyramid.

It is time to question that logic overtly. In the environmental movement, opinion probably ranges from: "free trade stinks" to "let's live with it and get the odd reform where we can". Most environmentalists can probably agree, though, that free trade has been used worldwide as an excuse for brutal welfare and public service cuts, Structural Adjustment Programmes and other practices which harm the poor and their land.

At first quietly, but now sometimes angrily, a growing band of critics — brought together by their opposition to the New World Order promised by the General Agreement on Tariffs and Trade (GATT) — have begun to argue against more trade. They have seen how more trade brings more of the problems the world needs less of: threats to the environment, uneven spread of employment, uncertain employment, and widening gaps between rich and poor, both within societies and between societies. Yet as we approach the 21st century, all that the economic ideologues of free trade can do — now that the alternative god, communism, is dead — is to reassert their message, apparently blind to free trade's existing effects.

Free trade is traditionally described as being at the opposite end of a continuum to protectionism. Our argument, however, is that both free trade and what we call the Old Protectionism have been approaches to trade and markets which have benefited the powerful. In contrast, what we call the New Protectionism focuses on the three "E"s — equity, economy and environment — by reducing economic gaps, protecting and healing land, water and air, and meeting basic social and human needs for all, not just the privileged few of a few countries.

Our assertion is that protection is good. The term has been made a dirty word by the free-trade ideology. Yet people pay taxes to the state and fees to lawyers to protect their interests; they expect their neighbours or the police to protect their homes; they demand that companies and governments protect the environment. Why then should they not also be entitled to the protection of their local economies?

The New Protectionism, with its emphasis on sustainable local and regional economies, is not just the route to a better, more equitable, more environmentally-friendly future, but also to a more diverse culture — the alternative to the Dallas-ization ushered in by the global telecommunication giants. The agenda includes:

- **Changing economic policy so that it emphasizes the regional and local rather than the global.** Instead of organizing the world's economy to become ever more internationally competitive, we want the reverse: for economies to develop locally and regionally; for international trade to be reduced; for production to be diverse and to be aimed first and foremost at local or national markets.
- **Promoting exchange for self-reliance.** The subtle new imperialism which claims that the South needs more and more of the North's skills or goods or services needs to be replaced with a more co-operative approach. We want to see less physical transfer of goods around the world. True, there needs to be exchange of skills and technical knowledge — and this exchange should be both from South to North and from North to South. But this knowledge should be used to produce goods and services in localities, but not to increase international trade.
- **"Ratchetting up" environmental and public protection standards.** Global harmonization is being used as an excuse to reduce standards. But standards should be "floors", not "ceilings" set to suit the interests of global traders (see Natalie Avery, Martine Drake and Tim Lang, "Codex Alimentarius: Who Is Allowed In? Who Is Left Out?", *this issue*, pp.110-112).
- **Controlling transnational corporations (TNCs).** An international Monopolies and Mergers Commission should be formed to break up cartels, rein in TNCs' global reach, and set up and enforce a new international legal framework which would both analyse TNCs and provide social and environmental criteria to determine how big companies should be allowed to be.
- **Evening out money flows.** Third World debt should eventually be written off, via a process which encourages increased regional economic diversity and narrows gaps between rich and poor within countries as well as between them. World Bank/IMF Structural Adjustment Programmes should stop. Funding in poor countries should go towards production mainly for local use, not for export.
- **Dismantling or reforming financial and trade bodies.** Fifty years on, there needs to be a re-evaluation of the goals of the institutions set up in the wake of the Bretton Woods agreement during World War II. Bodies such as the World Bank and IMF should be radically overhauled so that, instead of maximizing economic growth, they encourage regional economies which protect the environment and reduce the working week.
- **Turning GATT into GAST — the General Agreement for Sustainable Trade.** Trade rules should ensure economic activity which improves environmental standards, diversifies local economies and reduces gross inequalities. All other trade agreements (for example, the North American Free Trade Agreement, the Andean Pact, Mercosur and the new European Economic Area, which merges the EC and the European Free Trade Area) should be renegotiated, following environmental audits, to similar ends.

Tim Lang and Colin Hines

The New Protectionism: Protecting the Future against Free Trade by Tim Lang and Colin Hines will be published in July by Earthscan.

Next Step, Mr. Preston: Step Down

The World Bank is finally out of the Sardar Sarovar dam and irrigation project on India's Narmada River. Just one day before the 31 March deadline to meet the benchmarks on resettlement and environmental aspects of the project set by the Bank in October 1992 (see "Lies, Fantasy and Cynicism", *The Ecologist*, Vol 22, No 6, November/December 1992), the Indian government announced that it did not want the remaining $170m of the Bank's loan to be disbursed.

The Bank is out because the Indian authorities failed dismally to meet the benchmarks: they did not consult local people nor could they provide suitable land for oustees. Yet neither the Bank nor the Indian government will admit it. Indian environment minister Kamal Nath announced that the decision to cancel the loan had "nothing to do with any failure to meet our own targets, or theirs, for looking after the environment or resettling people." For its part, the Bank continued to provide public relations for the project. In a press release and a four-page *Questions and Answers* note distributed to Executive Directors and senior staff, the Bank rehashed the usual claimed benefits for the project — benefits which the Independent Review of Sardar Sarovar showed to be largely illusory.

Even for those experienced in the murky world of World Bank doublespeak, *Questions and Answers* is breathtaking in its dishonesty. Nowhere does it admit the fundamental problems with the project which have made the benchmarks unattainable — least of all the massive opposition among the 150,000 people to be displaced. Instead, it boasts of "evidence of substantial progress toward several of the benchmarks" and gives the excuse that "domestic difficulties unrelated to the project have made adherence to the previously envisaged timetable difficult." This refers to outbreaks of Hindu-Muslim violence — yet none of these occurred in the project-affected areas or had any discernible effect upon dam construction, police repression of dam opponents, or the clear-felling of the forests to be flooded.

More disturbing, however, is the Bank's claim that it believes the Indian government will "honour its commitment . . . to link the pace of dam construction to continued progress on resettlement and rehabilitation [R&R]." This link was laid out last September in a World Bank document entitled *Next Steps*. According to the Action Plan which formed the basis for *Next Steps*, the coming year's construction programme would be approved "in accordance with progress on resettlement" and affected people would be resettled "at least one year prior to submergence of their land and/or houses". Without this assurance, it is unlikely that the Executive Directors would have made the tragic error of voting for World Bank funding to continue for another six months.

Three months before *Next Steps* was issued, the dam wall reached 33 metres above sea level, high enough to bring the water to within a metre of the lowest house behind the dam during the monsoon. The dam is now at about 53 metres, well above the lowest houses in the threatened villages of Vadgam and Manibeli. The Chief Engineer, Mr B.J. Parmar, stated this March that he has been told to build to 61 metres by the start of the 1993 monsoon in June.

There are still hundreds of families living in areas which, barring an almost total failure of the monsoon, will be submerged for at least four or five months if the dam reaches this height. Many of these are among the 22,523 families who have taken a vow not to leave their homes; others are prepared to move but have not been given suitable alternative lands. The houses of these families will be washed away and their crops destroyed just before harvest-time. There is no meaningful link between dam construction and progress on R&R.

Murderous Pretence

For the last five years, the rallying cry of villagers and anti-dam activists has been "We will not move". A group of committed activists known as the *Samarpit Dal*—the Save or Drown Squad — have stayed in the lowest houses in Manibeli and Vadgam every monsoon since 1990 and vowed to face the waters should they rise. This year they are similarly committed — but this year, barring an announcement from the government that they will suspend construction and review the project, the activists will die.

The battle is now betwen the villagers and their state and national governments. But the Bank cannot escape responsibility for any deaths and misery to come. The authors of *Next Steps* must have known last September what the 1992/93 dam construction schedule was. They must have known that hundreds of families in the first villages scheduled for submergence were not yet resettled. And they must have known of the dam opponents' vow to drown rather than allow land and homes to be submerged. The obvious conclusion is that staff within the Bank's India Operations Department knowingly put hundreds of lives at risk by lying to their Executive Directors to persuade them to approve the Bank's plan to continue funding the dam. *Questions and Answers* shows that even now, with submergence just two months away, the staff continue to maintain the murderous pretence that there is somehow a link between construction and resettlement.

If staff are prepared to lie over a life-or-death issue in this, the Bank's most closely-watched project, it is clearly impossible to take at face value what the Bank claims for its numerous less-scrutinized projects and programmes. The Executive Directors, who have been so blatantly misled, should ensure that those responsible for *Next Steps* are never involved in another Bank project. The guilty must resign or be sacked. The Bank is a publicly funded institution with a remit to improve the lot of the poor — not to kill them.

The pruning should not stop at the lower orders. World Bank President Lewis Preston played a key role in getting the Bank's Board to allow funding to continue. He dismissed the conclusion of the chairman of the Independent Review on Sardar Sarovar, that *Next Steps* "ignores or misrepresents the main findings of our review." In Bombay he announced that Sardar Sarovar was "a project which is important for the people of India" and then broke a promise to meet with a delegation from the Narmada Bachao Andolan (NBA) who turned up at his hotel. Later, while a peaceful protest of villagers from the Narmada valley and their Bombay supporters was being brutally broken up by the police, he attended a fashion show in the hotel. "I don't think," he told the press the next day, "we can ever satisfy the extreme members of the environmental community".

The World Bank and its President, currently above the law, must be made accountable to the public. We agree with the NBA that this process should "start with the team that drafted *Next Steps*"; we also agree that "Lewis Preston, as the one who put his full weight and respectability behind it, must accept full responsibility and must step down."

The Editors

Community Forestry: A Critical Assessment

The Case of Nepal

by

Sabine Häusler

The Western concept of community forestry arose in the 1970s from a background of commercial forestry and a widespread sense of environmental crisis. As part of the "solution" to this crisis, community forestry, like commercial forestry, has tended to reduce the political dimension of environmental degradation to a technical problem. Nepal's Community Forestry Development Project, considered one of the most progressive in the world, broadened this approach and began to take into account voices from the grassroots. Yet if power relations are not recognized as a problem, even such new multidisciplinary approaches to environmental management can end up as simply more sophisticated versions of Western regimes of knowledge and power — and will rarely achieve their stated objective.

Understanding the roots of the global ecological crisis means understanding power — the power of the North over the South, rich over poor, governments over people, men over women — but as Michel Foucault has shown, this power is not something some people "have" and others "lack".[1] Nor is it necessarily repressive, coercive and violent. Rather, it forms a continuous, productive network in which both weak and strong participate. This tight web of power relations pervades families, societies, nations and the global political and economic system. Through modern institutions like schools, the army, hospitals and the development industry, it structures people's behaviour and their perceptions of what is normal or abnormal, true or false. In this respect, power is closely connected with the production of knowledge and with what is given the status of "truth".

Power and knowledge meet in discourse. Discourse in the form of theories and disciplines is linked to certain practices, techniques, policies and projects. These emerge in institutions such as universities, governments or development agencies and are formulated by privileged subjects such as scientists or development experts. Analysing a discourse entails constantly asking the questions: What is being argued in this discourse, by whom, and in whose interest? What and who is excluded and included in the discourse?

Through the development discourse, the "Third World" has been created as a "problem" which justifies Western social, political and economic engineering. At the same time, development experts have emerged as subjects to investigate ways of changing the behaviour of peasant farmers in the South, who become the objects of the discourse. These experts use a purportedly "universally-valid" science — which nevertheless flows mainly from the questions, hypotheses and observations of Western, white, Christian, middle-class male researchers working within Western types of academic institution.[2] In the West's political project of reshaping the South into a manageable form after its own image, "development" has been split up into technical problems for which new professional experts devise technical solutions in the form of development programmes and policies. Western control over the ex-colonies has thus been maintained uninterrupted.

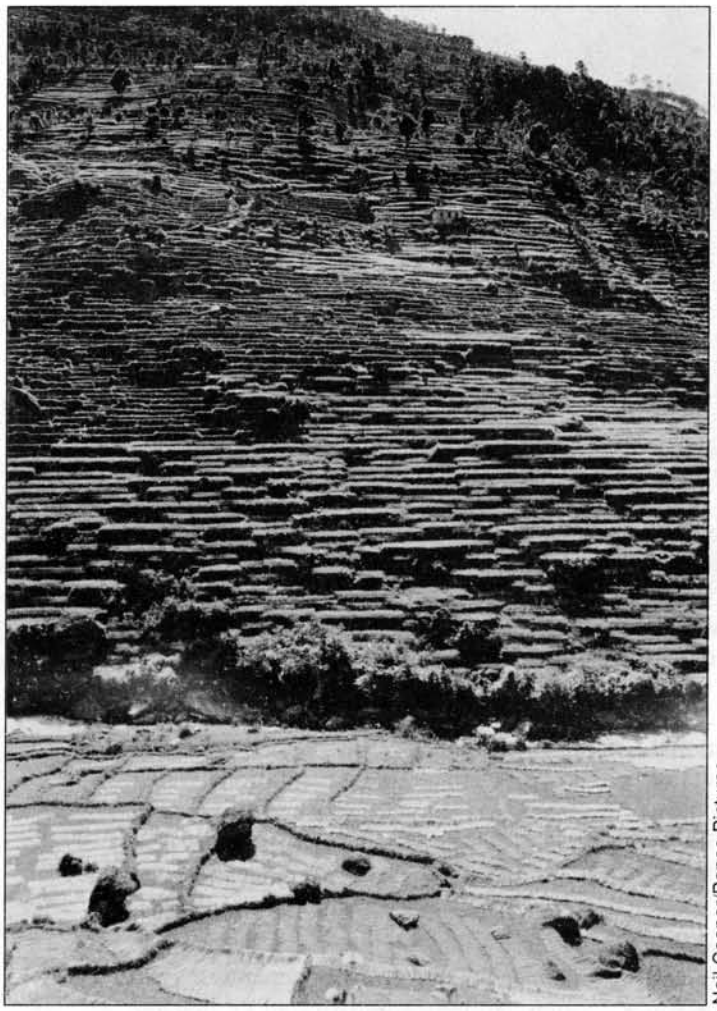
The Western community forestry discourse provides one example. In Nepal from the late 1970s onwards, the discourse cast environmental degradation first and foremost in the image of overpopulation and a lack of farmers' knowledge. Farmers, it was assumed, had to be "taught" and "motivated" to plant trees. With increasing experience and respect for local skills and needs, however, Western foresters gradually recognized that local farmers have been using and growing trees for centuries in locally-adapted ways. Perceiving the need to bring into the community forestry discourse excluded voices, particularly those of women, yet unable to speak out on politically sensitive subjects such as nepotism and corruption, which reduced people's interest in participating in community forestry development projects, foresters helped to promote "user-centred" and "participatory" approaches to forestry. These approaches created new openings for change in the discourse as well as some political space for local people to regain control over their forests. But the overall technical and institutional framework in which the foresters worked tended to reinforce the power structures which fostered environmental degradation.

Sabine Häusler worked as a forester in Nepal for four years with an international NGO. She is currently working on a research project on women, the environment and sustainable development at the Institute of Social Studies in The Hague, The Netherlands.

Colonial Soil Conservation

Many of the assumptions underlying the community forestry discourse can be traced back to the colonial era; the problem of soil erosion was widely recognized by colonial administrations, especially in Africa. In order to expand areas for cash crop production, colonial administrations confined local farmers to marginal soils, where they could survive only by overusing the land. The classical colonial approach to the resultant soil erosion consisted of four elements.[3] First, the problem was defined as an environmental, and not a social or political one. Colonial soil conservation programmes were thus implemented by force if necessary, since the colonial state was "protecting" the environment from the "destructive" practices of the local farmer. Second, mismanagement of the environment was seen as based on the farmer's laziness, ignorance and apathy. White settlers "used the land"; black farmers "destroyed" it through shifting cultivation and other practices, and thus needed to be "educated". Third, "overpopulation" was identified as a cause, ensuring that programmes to reduce the number of people became part and parcel of soil conservation programmes during colonial times. Finally, pastoralists and local cultivators were seen as poor because they were not sufficiently involved in the market economy. This justified the introduction of modern methods of mechanized agriculture, which were seen as both bringing in cash income and reducing the need for children as labourers. The practical effect of this colonial soil conservation discourse was to legitimize the extraction of the maximum agricultural and forest produce from the colonies.

When nation-states preoccupied with "development" replaced colonial adminstrations, the new national bureaucracies often simply took over where the colonial administrations had left off. Scientifically-trained foresters, both Western and national, took over the management of forests, which were often nationalized to ensure scientific management geared toward timber production for global markets and to "protect" them from local people's "destructive" practices.



Neil Cooper/Panos Pictures

Intensive terracing of rice fields paddy in eastern Nepal helps to prevent soil erosion.

Two general global trends in the early 1970s changed this. First, the 1973 oil "crisis" helped Northern development planners realize that tropical forests would continue to be the major source of energy for rural people for decades to come. Second, the development discourse began to place more emphasis on basic needs and rural development policies to complement urban-based, industrial growth policies which had left the majority of rural people worse off than before.

These trends reinforced the beliefs that rural, small-scale, forest-based industries were needed to create rural employment and income, and that deforestation in the tropics, which was seen as almost synonymous with soil erosion, was a major challenge both for developing countries and for the North (because of the danger of global climate change). Powerful images of poor farmers in the South who were destroying their own environments to survive filled the media.

The Emergence of Community Forestry

In the emerging discourse of an environmental crisis, the old colonial soil conservation discourse was revived. The causes of environmental degradation and deforestation were identified as overpopulation, overgrazing, cultivation of too-steep slopes, farmers' ignorance and competitive use of scarce forest resources. Population control and rural reforestation programmes were devised by Northern experts as the solutions. Excluded from this discourse were the processes that had led to environmental degradation in the South: for example, the introduction of industrial, export-led growth policies, deteriorating terms of trade for Southern countries, currency exchange-rate mechanisms, debt service to the World Bank and other lenders, the role of transnational timber corporations, lack of land reform policies, large-scale corruption, and national and local power structures.[4] Northern consumption of wood, paper and other forest products from the South was never even considered as a problem.

By the late 1970s, the concept of Community (or Social) Forestry had emerged from within international professional forestry circles and became a top priority in development assistance. In 1978, foresters attending the World Forestry Congress in Jakarta recognized the need to "involve rural people" in the management of local forests in order to curb large-scale environmental degradation in the South.

They launched the concept of "Forests for People", the main innovation of which was to encourage local communities to use their forest resources in a "responsible" way. Local people were to "take part in their own development". "Decentralization" and "participation" became key notions in the community forestry discourse. In the words of a forestry expert working in the United Nations Food and Agriculture Organization (FAO), the needs of rural people were taken into account by:

Sean Sprague/Panos Pictures

While Hill farmers' gathering of firewood has been identified as a major cause of deforestation . . .

". . . scaling down the conventional parameters of forestry to the level of a village or community woodlot, which was provided through [forest department] services, or on the instruction of the government."[5]

Community forestry, in other words, was conceived as commercial monocrop plantation forestry writ small. FAO defined Community/Social forestry as:

". . . any situation which intimately involves local people in a forestry activity. It embraces a spectrum of situations ranging from woodlots in areas which are short of wood and other forest products for local needs, through the growing of trees at the farm level to provide cash crops and the processing of forest products at the household, artisan or small-industry level to generate income, to the activities of forest-dwelling communities. It excludes large-scale industrial forestry which contributes to community development solely through employment and wages, but it does include activities of forest industry enterprises and public forest services which encourage and assist forestry activities at the community level."[6]

Foresters started to look into planting trees in homesteads, on the edges of fields and riverbanks, and on community, government, leased or private land. Local people, assumed to be ignorant, were subjected to disciplinary technology: extension programmes were designed to "educate" farmers, schoolchildren, women and cooperatives about the benefits of tree planting. Farmers were taught how to plant and lop trees "correctly" and how to manage forest plantations.

When anthropologists and other social scientists joined community forestry programmes to make the schemes more acceptable to local people, they soon "discovered" that in fact rural people had managed their forests for generations and often had very sophisticated knowledge about the characteristics and use of local tree species based on close observation and experimentation. In some places local management systems were still intact. In India, for example, functioning communal management systems provided:

". . . security of tenure to the user group; use regulations which are evolved locally, and marked by simplicity of individual rules and an ability to change these rules to meet new challenges; benefit allocation managed by the community to reflect the realities of the community structure; management focused on low value products of local importance." [7]

Where such systems had collapsed, this was usually due to the loss of local control, often because of the nationalization of forests: realizing that they were unlikely to benefit from forests under government control, people saw no reason to protect them.

The "discovery" of the intricate nature of local knowledge and practices of tree cultivation has led to the emergence of a new field of scientific inquiry in development circles: indigenous knowledge systems. The incorporation of some of this knowledge and of local people's voices into the community-forestry discourse has had a positive effect, supplementing the body of knowledge Western experts bring to community forestry. But despite these changes, after 15 years of Western-funded community forestry schemes in the South, the myth of farmers' ignorance about the need for tree planting and of the need for extension and motivation remains pervasive in the international community forestry discourse.

Environmental Crisis in Nepal

Landlocked Nepal comprises three distinct geographic regions: the Plains or Terai bordering India in the South, the Hills, ranging in altitude from 300 to 3,000 metres, and the mountainous region adjoining China to the North. Over 90 per cent of the 19 million Nepalis are involved in agriculture. Two-thirds of them live in the Hills, cultivating steep slopes and valley bottoms, mainly on terraces, in a mixed farming system based on the availability of fuel and animal fodder, mostly from the forest.

In the early 1970s, disastrous flooding in Bangladesh and massive soil erosion in Nepal began to be widely blamed in development circles on rapid deforestation in the Nepali Hills, exacerbated by rapid population growth, increasing numbers of livestock and cultivation of unterraced, steep slopes.

On closer examination, however, a more complex picture emerges. Deforestation in the Hills is not a recent phenomenon. By the 19th century, the élite of the semi-feudal Nepali tributary state had started to cut down sizeable amounts of timber in exchange for foreign luxury goods, and large tracts of the Terai forests were cut to help the British construct the Indian railway system. Once the Terai forests were destroyed, the onslaught on the Hills began. Local landlords encouraged their sharecroppers to cut down forests in order to increase the agricultural area and hence their share of the crop. Declining yields exacerbated by a lack of inputs into agriculture led to farmers' clearing yet more forests.

Second, the advent of foreign aid provided strong incentives for inflating population estimates. Inaccuracies were made worse by the lack of transport in the Hills; walking is the only way to get to many of the villages. Many census takers do not bother to walk up every hillside to count a few people; they know that the more they "count", the more they have worked.[8]

Geological research, meanwhile, suggests that the massive amount of sediment tranported down the Himalayan rivers through India into the plains of Bangladesh originates mainly in tectonic uplifts (a natural feature of the geologically young Himalayas), glacial-lake outbursts and mass movement of sediment in the high mountains. According to this view, topsoil washed down from the Hills is only a small part of the sediment which contributes to flooding downstream in the peak monsoon rainfalls. According to geologist Brian Carson, large-scale erosion processes and downstream floods have been taking place for centuries.[9] The role of tree planting protecting topsoils and in preventing these floods, he claims, has been largely overemphasized.

In summary, the extent of the environmental degradation taking place in Nepal is unclear and the reasons for it much more complex than often believed. As Piers Blaikie has concluded:

> "The confirmation that there is, in fact, land degradation taking place can be a daunting task. The momentum of government publications, received wisdom and academic research can so condition the perceptions of policymakers at a point in time that it is sometimes difficult for any counter-intuitive results of research to gain credibility. The underlying reason for this is that, in spite of all advances in data collection, remote sensing and basic research into the physical processes of land degradation, there is usually insufficient evidence that irreparable damage is taking place."[10]

Whatever its factual basis, the environmental crisis in Nepal has been used by different parties in different ways, in line with their interests, perspectives and political convictions. It has helped the Nepali government to argue for large aid flows. These enabled the King, before his overthrow in 1990, both to pursue a non-alignment policy with the neighbouring Asian superpowers, India and China, and to placate educated urban élites by supplying them with government jobs which administered these funds. Bangladesh, as one of the poorest countries in the world and generally perceived as a "basket case", has used the crisis discourse for its own purposes, joining India in waging diplomatic battles with Nepal over the latter's environmental "irresponsibility".

Foreign donors, meanwhile, often flown in on short field trips and confronted with highly eroded roads, have readily swallowed the explanations they have been given of the problem and agreed to fund more forestry and soil conservation projects. Donor governments have also had an interest in securing their presence in Nepal as a buffer state between communist and capitalist worlds.

Mark Edwards/Still Pictures

. . . the long history of logging in Nepal for the benefit of various élites has been less discussed.

As the environmental crisis discourse spread in Western media, foreign non-governmental organizations (NGOs) started to get involved as well. Criticisms by their personnel of the inefficiency and widespread corruption in the government agencies with whom they cooperated were quickly silenced in the rather repressive political climate of the one-party Panchayat system. Many international NGOs and development agencies, sending their personnel directly into government departments, ended up merely filling in for deficient state services. Meanwhile, with decentralization and rural development policies, more aid money began to be channelled to local projects, increasing village politicians' capacity to reap personal profits and expand their own political influence. Notably unrepresented as enunciators of this crisis discourse were the majority of local farmers, the actual forest users.

The Community Forestry Development Project

Until the early 1970s, the timber stands in the Terai had been the main focus of foresters' attention; the Nepali government had nationalized all forests in 1957 and established a forest department in the 1960s to ensure their scientific management. But as the "environmental crisis" discourse emerged, attention shifted to the Hill areas; the Hill farmer began to be identified as the major reason for the crisis and thus became the object of the community forestry discourse. In 1980, enthusiastic foreign forestry experts joined with some committed Nepali forest officers in launching the idea for the government Community Forestry Development Project (CFDP),[11] which was funded by the World Bank, FAO and the United Nations Development Programme (UNDP).

Operating in 27 Hill districts, the project aimed to hand over three categories of forests from the state to local communities: Panchayat Forests or PFs (new plantations of up to 125 hectares established on government wasteland with government help),[12] Panchayat Protected Forests or PPFs (degraded local forests of up to 500 hectares requiring replanting or protection) and Private Forests. Income from PFs and PPFs had to be split between the government and the local community.[13] In addition, a fuel-saving stove programme was launched in order to curb fuelwood consumption, and a new central Community Forestry and Afforestation Division within the Department of Forests and Soil Conservation was set up in Kathmandu. A new cadre of government field workers — community forestry assistants — was introduced. Forest foremen and watchers were employed at the local level. Several donor countries assisted the Community Forestry Project in different Hill districts, notably Australia, the US, Canada, Switzerland, Germany and the UK.

Community Forestry Evolves

Over the years, the foreign foresters involved in CFDP generated a series of problems and research questions geared at improving implementation of the project countrywide. An analysis of these studies illustrates how the community forestry discourse in Nepal evolved and how they helped to import the Western power/knowledge regime.

At the beginning, foreign experts were preoccupied with how to establish and run effective tree nursuries in the Hills. Interest then shifted to the maximization of biomass output from plantations. Eventually, the foresters began to focus on the format and content of local forest management plans. The latter signaled an important shift in the discourse from a purely technical towards a more social focus.

Anthropologists, trying to answer the question of how to involve local people in forest management, pointed out that the few forest committees formed since the beginning of the project had not really functioned. Management plans were often written up by forest rangers to reflect their own perceptions of local needs and then merely presented for endorsement to the committees, which were often dominated by local political leaders. In public meetings the actual forest users, the majority of them women, did not voice their needs. The tree selected for reforestation was often pine, which is hardy and useful for timber but does not meet local fodder needs. It began to be clear to the foresters that it is not enough to define quantitative national tree-planting targets and then incorporate local areas into this scheme without a qualitative assessment of local needs and interests in tree planting, effectiveness of user committees, local tree survival rates, locally preferred species, and so on.

Parallel shifts were taking place elsewhere in international development circles. By the mid-1980s, it was realized that rural women were the main users of forest products and were usually responsible for collecting fuel, fodder and water for family survival. The global feminization of poverty and an increase in the number of female-headed households led to the recognition that women ought to be given a role in development projects.[14] Foreign male foresters had talked only to village heads on their visits to the countryside, and never to rural women; but as "women and forestry" became a fashionable subject, foreign women foresters were recruited to "involve" rural women in community forestry work. Many foreign and Nepali foresters stated that it was no wonder that forest committees could not work if women were not involved.

In 1986 a British woman forester, living in a remote area of Western Nepal, succeeded in forming an all-woman forest committee. The existing, all-male committee, inactive like most others in the country, agreed to let the foreign forester "educate" their women not to "destroy" their forest. Encouraged by the male support, the women and their British adviser devised a simple rotation system to use a nearby forest. At any particular time, certain parts of the forest would be closed for regeneration while others would be used on a daily basis. In the words of the forester:

> "The women who have decided to work on this committee form an ideal group for the CFDP field staff. They represent a strong, influential and interested group to work with, to train, to use to train others and act as a source of information and ideas in the Panchayat."[15]

The forester's instrumental language reflects her preoccupation with protecting the forest above a concern with the rights of the women users. Yet the emergence of an active women's forest committee was an important event that contributed to creating some political space for manoeuvre for a marginal group. (A serious setback occurred, however, when some contractors tried to cut part of their forest. The women were not supported by the District Forest Office, and eventually their forest committee collapsed.)

In 1987, Australian forester Don Gilmour took the new sensitivity to local groups one step further by questioning the widespread myth of farmer's ignorance:

> "There is no doubt that there are problems with resource availability in the Nepal Mid Hills region, but the fact remains that 50 per cent of this region is still forest or shrub covered. This area can be managed to provide a continuing source of forest products as long as the villagers themselves are allowed to have effective control of the land and are helped to develop simple management schemes. Most people blame the mountain peasant farmer for the present deforestation problem without recognizing that these same farmers have a well-developed ability to adapt their farming practices and to survive under changing circumstances."[16]

The Expert Dilemma

At the same time that previously-unheard voices from the margins were being introduced into the community forestry discourse, Western forestry experts, concerned to do a good technical job, were beginning to try to come to terms with the problem of national and local power relations in implementing community forestry.

Women foresters noted that not only women but also other marginalized groups had not been involved in the community forestry project. Such groups, they pointed out, were often keen to plant trees, but were afraid to because local and national

power structures, including the forest department, were reluctant to hand over to them control of their forests. Many forest committees which had been formed by the CFDP in top-down fashion were inactive because they were dominated by local political leaders, not actual forest users. In some cases alliances between forest rangers and local leaders hampered the flow of information and funds to the forest users.[17]

In the eastern part of the Kathmandu Valley, one local community had protected their forest for many years. They had collected money from each household to support a forest watcher who kept outsiders and animals away from the forest. With the introduction of community forestry, the government started to pay the watcher, who became accountable not to the villagers but to the forest department. He started to take bribes from outsiders to enter the forest, which soon deteriorated.[18]

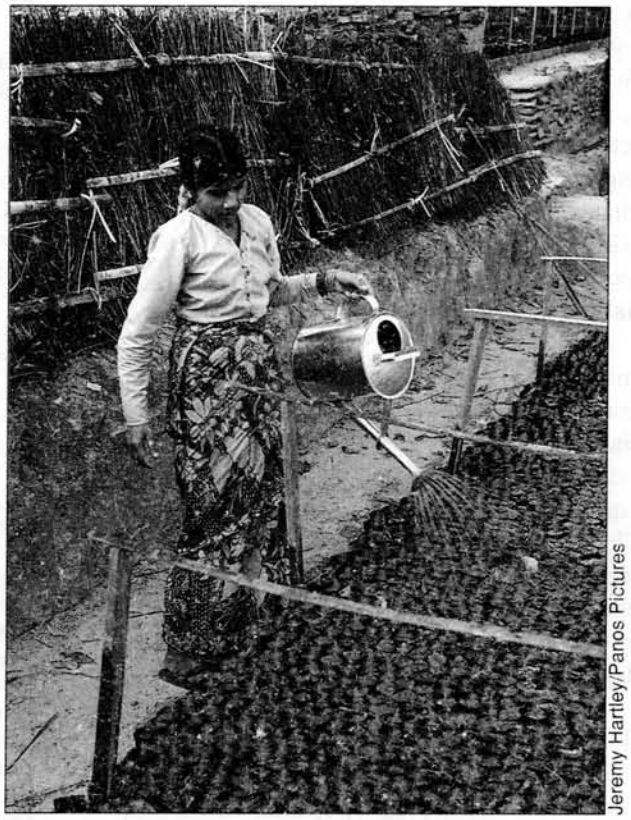
Other foresters, studying the structure and composition of a forest user committee, widely recognized as "successful" because of the flourishing local forest, discovered that the local leader controlled the forest in his own interest and allowed access to it only to his own political supporters. In this case, the foresters approached the heart of the community forestry issue by recognizing that the CFDP had, in effect, reinforced the local power structure and contributed to marginalizing people who then had to search for forest products elsewhere. Still, they concluded that a foreign-funded project could only intervene into élite control over resources as far as national and local power structures would allow for.[19]

An anthropologist pointed out the institutional incompatibility between the highly-centralized bureaucracy and the imperative for decentralized procedures in a CFDP scheme that was to serve local people's needs.[20] He saw the clash between government and local approaches to forest management as a conflict between two different cultures: that of bureaucracy and that of rural society. Yet he failed to acknowledge that the issue at stake was that of power relations.

Foreign foresters sensitized to the hampering effect of power relations became increasingly frustrated because they could not do their job properly. Within the community forestry discourse, this frustration led them to argue that the major problem for implementation of community forestry schemes lay in the centralized and top-down approach of the forest department, which did not allow space for local flexibility. A large national workshop on Community Forestry Management organized in 1987 to assess the progress of the CFDP, for example, highlighted both the necessity of transfer of full local control from the government to democratic forest user groups and the importance of understanding local situations, needs and knowledge. However, no direct challenge to the existing power structure could be made.[21]

Foreign foresters' increased political awareness did have two practical effects within the community forestry discourse in Nepal. One was the creation of a programme to retrain forestry department staff towards more "participatory" styles of extension to provide more space for local flexibility. Another was the scaling down of private planting schemes to individual farmers. Although the major beneficiaries of such schemes were larger landholders with enough land to plant trees, formalities for registering tree tenure were gradually improved, so that small landholders became less fearful that the government would claim the land on which they had planted trees.

Much has been learnt in the course of the Community Forestry Project in Nepal, and in some places political space has been created for local people to regain control over their forests. In the early stages of Nepal's Community Forest Development Project, however, foreign forestry experts were the victims of their own misconceptions of the rural situation. Yet having recognized the nature of the situation, they stopped short of calling a major problem by its name: power. Caught in a double-bind between this realisation and their technical position in the CFDP, they tended to advocate only the solutions they could supply: the re-training of forest department staff. The abundance of aid itself in Nepal may have been responsible for hampering the much-needed political changes. Only after the overthrow of the one-party state and the introduction of a more democratic government have local people's organizations and movements found more room for manoeuvre.



Jeremy Hartley/Panos Pictures

Pine trees were easy to raise in government nurseries, but few survived once planted out.

Conclusions

I have tried to highlight the complex interconnections between power and knowledge and how these have played themselves out in the context of the community foresty project in Nepal. The inherently political problems of environmental degradation cannot be solved by compartmentalized technical means. Nor are technical interventions likely to suceed under undemocratic governments.

Instead as a first step, the natural, historical, economic and political factors that have led to environmental degradation need to be analysed. A full account of specific international, national and local situations, constraints and needs is also imperative. The widespread interest in "indigenous knowledge systems" by natural scientists, anthropologists and development experts has been a further positive step towards valuing local, subjugated knowledge.

But there is a danger that the accumulation of such knowledges by Western actors, enshrined in Western academic institutions, may monopolize them and then "give" them back to local people in the terms of Western power/knowledge regimes. For development experts, there is a danger of speaking "on behalf of" or "for" local people.

Another extreme is the tendency to simply reverse hierarchies of Western

scientific knowledge over local, vernacular knowledges when not everything local is simply "good" and everything Western simply "bad". All knowledge is partial and based on a particular perspective. What is needed is an understanding of how knowledge transports and facilitates power relations. A politically sensitive way to bring different types of knowledge together in a process of negotiation is needed.

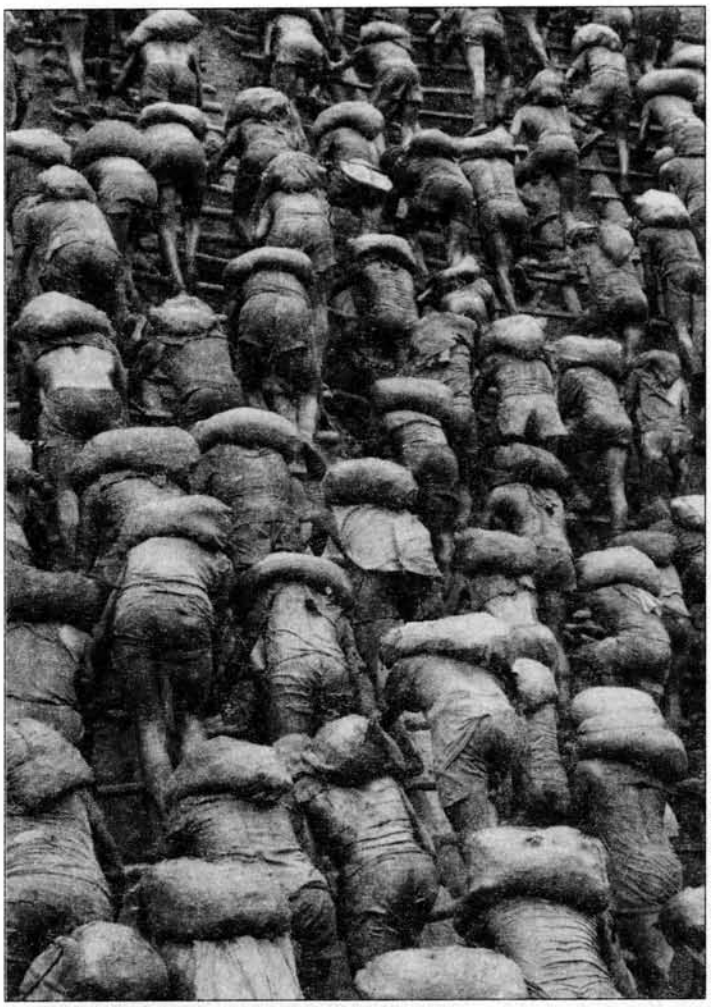
If power relations are not recognized at all levels as a problem, and Western experts do not acknowledge their biases, the political nature of their work, and the partial nature of even their most multidisciplinary efforts to cater to local needs, reformist top-down approaches derived from their findings will tend to reinforce old or create new networks of power under which environmental degradation takes place.

Arguing for more user-centred and participatory approaches is not enough — it may just buy a little time. The community forestry discourse must include the role of power relations and how they affect the implementation of development projects. Local people need to gain a voice in this discourse, otherwise it will be only too easy to keep blaming them for their ignorance.

Foresters interested in contributing to ecological recovery must get involved in strategic thinking on how to address such questions. Above all, they must acknowledge that, even though they see themselves as technicians, they are necessarily political agents, and must begin to think self-critically about how to deal with this recognition.

Notes and References

1. See Foucault, M., *Power/Knowledge*, Harvester Press, London, 1980.
2. See, for example, Kuhn, T., *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, 1962; or the work of feminists such as Haraway, D., *Simians, Cyborgs and Women: The Reinvention of Nature*, Free Association Books, London, 1991 and Harding, S., *Whose Science? Whose Knowledge?*, Open University Press, Milton Keynes, 1992.
3. See Blaikie, P., *The Political Economy of Soil Erosion in Developing Countries*, Longman, London, 1985 and Blaikie, P. and Brookfield, H., *Land Degradation and Society*, Methuen, London, 1987.
4. See Blaikie, P., "The State of Land Management Policy — Present and Future", paper presented at the Rural Development Studies Research Seminar at the Institute of Social Studies, The Hague, 4 November, 1990, Fig. 1, p. 7.
5. Arnold, J. E. M., "Community Forestry" in *Ambio*, Vol. 16, No. 2-3, 1987, pp.122-28.
6. FAO, "Forestry for Local Community Development", Forestry Paper No. 7, Rome, 1978.
7. Arnold, J.E.M. and Steward, J., cited in Arnold, J.E.M. *Community Forestry: Ten Years in Review*, FAO, Rome, 1989.
8. The unreliable nature of any statistics collected in Nepal is a serious problem. See Thompson, M., Warburton, M and Hatley, T., *Uncertainty on a Himalayan Scale*, Milton Ash Editions, London, 1986 which concludes that any development policy could be justified by existing quantitative data on fuelwood consumption per capita per annum; the figures available varied by a factor of 67.
9. Carson, B., "Erosion and Sedimentation Processes in the Nepalese Himalayas", ICIMOD Occasional Paper No. 1, Kathmandu, 1985.
10. See Blaikie, P., op. cit. 4.
11. The use of the term "community forestry" instead of "social forestry" was a conscious choice, made so as to distinguish the Nepali Project from the Indian one. The Social Forestry Project launched in India was considered by Nepali and expatriate foresters as too authoritarian and vesting too much power in the government forestry administration. The Nepali programme was seen from the outset as a more people-oriented programme.
12. The use of the term *Panchayat* was discontinued after the overthrow of the King and the one-party *Panchayat* System in 1990. The word was replaced with "village development committee". Such committees vary in size, but may include up to 2,000 to 3,000 people.
13. The monetization of local forests was a problem in itself because it meant that local users had to pay for using a commodity that had previously been free.
14. See Braidotti, R., Charkiewicz, E., Häusler, S. and Wieringa, S., *Women, the Environment and Sustainable Development: Towards a Theoretical Synthesis*, Zed Books, London and New Jersey, (forthcoming 1993).
15. Gronow, J., *The All-Woman Forest Committee of Dharchula District: A Role for Nepalese Women in Community Forestry?*, mimeo, Kathmandu, 1986.
16. Gilmour, D., *Not Seeing the Trees for the Forest: A Re-Appraisal of the Deforestation Crisis in Two Hill Districts of Nepal*, Nepal-Australia Forestry Project, Kathmandu, 1987.
17. Corruption is by no means merely a widespread local problem. In 1988 the Minister of Forests and Soil Conservation was jailed on charges of corruption. The damage incurred in terms of forest destruction, fines foregone, and so on was estimated at some 75 million rupees (US$4.4 million). See "Action against Hem Bahadur Malla", Editorial in *Rising Nepal*, 26 May, 1988.
18. personal observation.
19. See Hobley, M., Gilmour, D. and King, G. *Participatory Forest Management: Who Benefits?* Nepal-Australia Forestry Project, Kathmandu, 1988.
20. See Fisher, R.J., "Institutional Incompatibility in Community Forestry: The Case of Nepal", Working Paper No. 22, East-West Environment and Policy Institute, Honolulu, 1990.
21. See Banko Janakari in *Community Forestry Management*, Vol. 1, No. 4 for the workshop proceedings.



Sebastiao Salgado/Magnum

Gold Miners at Serra Pelada, Brazil.

The Price of Gold

Environmental Costs of the New Gold Rush

by
Jed Greer

The magical properties with which the Egyptian priestcraft anciently imbued the yellow metal, it has never altogether lost. **John Maynard Keynes**

The last decade has witnessed a rapid increase in the amount of gold mining. This new gold rush involves techniques of extraction, processing and waste disposal — some traditional, some innovative — which will leave an enduring and profoundly destructive legacy. The irresponsible use of mercury and cyanide, the discharge of toxic waste directly into rivers and seas, and the proliferation of open-cast mines will result in long-term ecological degradation and risks to human health.

However one interprets its attraction, the pursuit and accumulation of gold have made an important mark on history, and frequently that mark has been a scar. Gold motivated the European conquest of what is now Latin America and the atrocious acts of violence against people and nature that ensued. Even before miners of the 1849 gold rush in the United States had inflicted their most grievous injuries on the environment, a witness described one gold-bearing region thus: "All the valleys being dug up and washed gravel thrown into heaps, their beauty was entirely destroyed, and the scene resembled a series of brickyards."[1]

The appeal of gold has not diminished over the last century, nor the damage caused by its unscrupulous extraction. Since the early 1980s, there has been a surge in gold production, fuelled by buoyant prices for the metal on the international market, and involving both large mining companies and small-scale prospectors.

In January 1980, the price of gold on the New York Commodity Exchange and the London Metal Exchange soared briefly to an unprecedented US$850 an ounce. This price explosion had been preceded in the 1970s by a steady rise from US$35 to about US$300, in response to increasing oil prices and inflation (investors regard gold as an excellent hedge against an inflationary trend). The reasons behind the huge price jump in 1980 are not entirely known. It seems likely, however, that investor anxiety generated by the Soviet invasion of Afghanistan, the consolidation of Ayatollah Khomeini's rule in Iran, and high inflation in the United States were important contributory factors.[2]

The price of gold fluctuated throughout the 1980s, averaging between US$300 and US$500 an ounce. For much of the decade, central banks and government monetary agencies were net buyers of gold, and Hong Kong and New York gold-trading markets prospered. In the second half of the 1980s, particularly in Asia, investment demand for gold rose sharply. About three-quarters of new gold output went to Asia in 1988. In Taiwan, Japan, South Korea, Hong Kong and Singapore, a rise in personal disposable incomes and a fear of future recession combined to encourage greater purchases of gold as a store of wealth and as adornment.

The supply of newly-mined gold in this period grew dramatically to meet higher demand. Between 1980 and 1990, annual production of new gold increased from 962 to 1,734 metric tonnes. Producers in the industrialized world, primarily the United States, Canada and Australia, raised their output many times. By the end of the decade, these producers controlled one-third of new gold's market share, up from 12 per cent in 1980. Less-industrialized nations, such as Brazil, the Philippines, Papua New Guinea, Ghana, Zimbabwe and Ecuador, more than doubled their output to acquire 26 per cent of the new gold market, up nine per cent since 1980. Brazil became the non-communist world's sixth largest gold producer in the 1980s, while analysts predicted that Papua New Guinea would emerge as a major global gold supplier by the mid-1990s.

In industrialized countries, it was big corporate mining interests that propelled this growth. "Almost every metal mining company in the world," one US geological consultant asserted in 1990, "is now active in gold exploration."[3] In Latin America,

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Asia, and Africa (outside South Africa), however, small-scale or informal sector mining operations produced much, and in some areas most, of the new gold. These operations are thought to employ several million individuals worldwide and to account for one-quarter of global gold output.[4] Small-scale operations are also responsible for what is perhaps the most pernicious aspect of the new gold rush: mercury pollution.

The Pauper's Poison

People have recognized mercury's toxicity for many centuries. Able to enter the body through inhalation, ingestion or absorption through the skin, mercury is readily transported by the circulatory system once inside the body and deposited mainly in the central nervous system and the brain. The symptoms of acute mercury poisoning include breathing difficulties, nausea, diarrhoea and skin irritation. Chronic poisoning can lead to insomnia, memory loss, vision problems, loss of smell, difficulties in hearing and ability to speak properly, severe tremors, brain damage and death. Mercury can enter the placenta and cause birth defects.

From 1860 to 1925, amalgamation, the process of using liquid mercury to separate gold particles from river sediment, was the principal technique for gold recovery worldwide, and was practised commonly in the United States up until World War II.[5] For economic and environmental reasons, the formal mining sector abandoned amalgamation some time ago.

Small-scale mine operators in South America, Asia and Africa, often driven by unemployment, poverty and landlessness, have resorted to amalgamation because they lack affordable alternative technologies.[6] Typically, these operators pour liquid mercury over crushed ore in a pan or sluice. They separate the amalgam — a mixture of gold and mercury — by hand, press it through a cloth to expel the excess mercury (which can then be reused), and heat it with a blowtorch. The last of the mercury evaporates as a white gas, and gold remains.[7]

Although mercury pollution is possible at all stages of the amalgamation process, up to 70 per cent of the losses occur during the blowtorching. Most of these atmospheric emissions quickly return to the river ecosystem in rain and concentrate in bottom sediment. There is also minor spillage in the separation stage, the cumulative effect of which could be substantial. Across the globe, it is estimated that small-scale gold mining operations release between 400 and 500 tonnes of mercury into the environment annually.[8]

Throughout the Brazilian Amazon, approximately 650,000 small-scale miners (*garimpeiros*) are responsible for as much as 90 per cent of Brazil's gold production and for the discharge of 90-120 tonnes of mercury each year. Researchers have discovered significant contamination in the Amazon's aquatic ecosystem from mercury use in gold mining. In the Madeira river basin, mercury levels in some streams' sediment are 1,500 times the natural background level and the basin's average value of dissolved mercury concentration is 17 times higher than the average for rivers throughout the world.[9]

Mercury has accumulated in many fish species to the extent that they are deemed unacceptable for human consumption. In Rondônia and two other states, a large percentage of fish found downstream from gold mining operations have mercury concentrations exceeding the maximum permissible limit of both Brazil and the US.[10] In the Mato Grosso's Pantanal, the world's largest wetlands and an area of great biodiversity, researchers have found fish with mercury concentrations 24 times the level that the World Health Organization considers safe.[11] Mercury-contaminated fish have been detected 360 miles downstream from some mining areas.

Equally alarming is the situation in the Philippines, where small-scale gold mining takes place in at least 34 provinces and involves as many as 200,000 people. Most mining activity takes place on the island of Mindanao, especially in Davao del Norte, where approximately 25 tonnes of mercury are released into the environment annually. The region's Agusan River and its tributaries are heavily contaminated and sea water in the Gulf of Davao, 120 miles downstream, shows mercury levels up to 200 times those of average ocean water.[12]

The build-up of mercury in the food chain jeopardizes a wide range of wildlife, particularly fish-eating birds and mammals. Mercury has been confirmed in the United States as the cause of death of panthers and loons and is a suspected reason for the reproductive failure of eagles, otters and other animals.[13]

The threat to marine ecosystems is long-term, because mercury can reside in river sediment for many decades. Much of the mercury discharged into the environment from small-scale gold mining has been trapped in the soft sediment of rivers and can be re-released in several ways: through flash flooding, consumption by bottom feeding fish or microbial digestion and methylation. Remobilization of this additional mercury may create ecological disasters far greater than those evident today.[14] In the words of Elmer Prata Salomao, director general of Brazil's National Department of Mineral Production: "Mercury pollution of rivers is a delayed-action time bomb."[15]

The human health consequences of mercury use are beginning to appear; small-scale gold miners rarely wear protective equipment such as gloves or face masks during the amalgamation process. Blowtorching is conducted either outdoors, on riverbanks or boats, or inside trading posts or private homes. Brazilian miners commonly heat amalgam in their kitchens, where cylinders usually connected to cooking equipment are used to fuel blowtorches.[16]

In 1987, the first incident of mercury poisoning was reported in the Philippines: eleven persons became ill and one died after eight hours spent blowtorching a large amount of ore indoors. A Philippine study of individuals exposed to mercury for an average of 30 months or who lived within 500 metres of a source of mercury discovered that nearly three-quarters of those examined showed clinical symptoms of poisoning. Tests from seven mining sites in Brazil found that one-third of the miners had mercury over the World Health Organization's tolerable limit; one individual's level was 19 times that limit.[17] In both countries the authorities fear the level of contamination will rise.

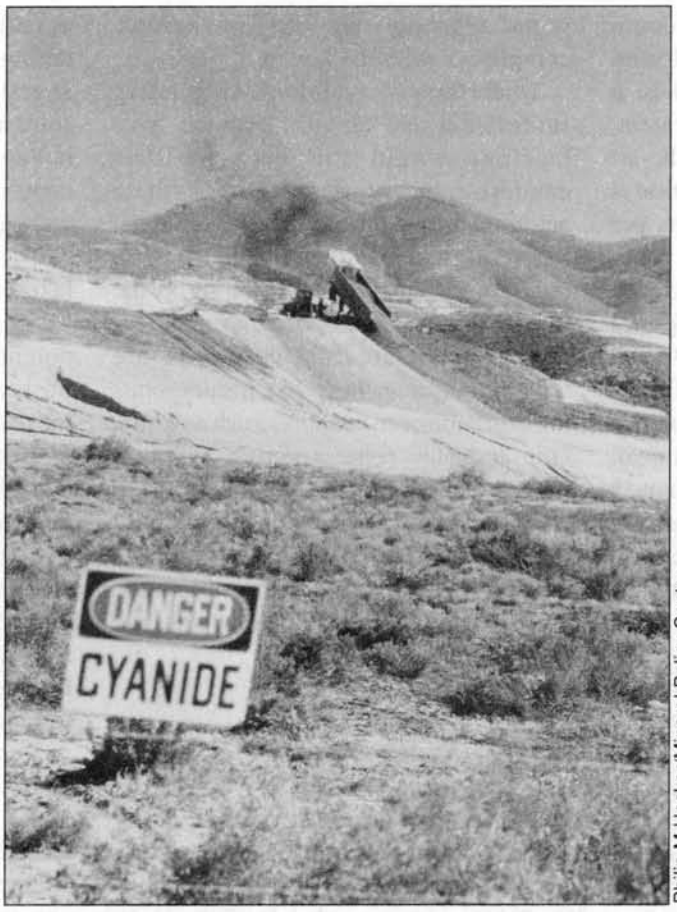
In addition, many people not directly involved in mining have been or will be affected by mercury contamination, often through eating contaminated fish. One-fifth of marine seafood samples taken in the Gulf of Davao, a rich fishing ground, revealed mercury levels greater than the World Health Organization's maximum permitted concentration.[18] The sale of fish from the Gulf exposes the general Philippine population to the dangers of mercury.

In Brazil, tests on the Kayapó people, whose territory has been home to thousands of small-scale gold miners,

indicated that one-quarter had high levels of mercury. In another study by the Brazilian government, the amount of mercury in the blood of Kayapó children was found to be only slightly less than that in miners' blood.[19]

Much publicity has been given to the Brazilian gold miners' conflict with indigenous peoples of the Amazon such as the Yanomami. Often the miners are portrayed as victimizers: their hunting has deprived tribal groups of food, they have polluted rivers with sediment in addition to mercury and they have introduced contagious diseases including malaria and tuberculosis. But, as Susanna Hecht and Alexander Cockburn observe, the miners "are victims too, of hard times and limited opportunities for Brazil's small farmers, and of the harsh fight to survive in the cities."[20] Small-scale gold mining has offered numerous poor people an income, however meagre, and the opportunity for upward mobility, however tenuous.[21]

The United Nations Environment Programme recommends that "use of mercury amalgamation should be prohibited."[22] But in Brazil and the Philippines, little appears to have been accomplished by attempts to educate miners about mercury's hazards or by regulation curbing its use.[23] As long as mercury is easily available and affordable and as long as the price of gold makes extraction and processing a viable occupation, mere regulation will not dissuade poor people from continuing this harmful practice.



Philip M.Hocker/Mineral Policy Center

A cyanide leaching heap being built at Crowfoot Mine, Nevada, USA.

The Corporate Poison

The price of gold has also encouraged large corporations to increase gold production. Mining companies in the US, Australia and Canada have prospected new areas, and also have examined older sites and abandoned mines in the hope of profitably separating gold from waste rock and low-grade ore. An inexpensive technique called cyanide heap leaching, the fruit of research by the US Bureau of Mines in the early 1970s, has enabled companies to mine and process ore with a much smaller gold content — as little as .01 troy ounces of gold per tonne of ore — than required by conventional processing methods. Many cyanide heap leach facilities produce gold for under US$200 per ounce, which in the context of the 1980s gold market turned the possibility of high profit margins into a reality.[24]

Cyanide heap leaching involves the open-air soaking of huge amounts of ore with cyanide solution. Crushed ore is placed on pads lined with clay or plastic. These heaps can stand from ten to 200 feet high, span one to several hundred acres, and involve thousands to millions of tonnes of ore. The cyanide solution is applied to the ore, by pump or spray system, and percolates through the material, dissolving the gold and carrying it to collection ponds. Once the liquid has passed through a series of processes to remove the gold, the cyanide solution is reconstituted and reused until the ore is completely leached. Depending on the ore, leaching takes between one week and three months.

A Vancouver-based Canadian company was the first to establish a successful gold mine using cyanide heap leaching and Canadian firms have been active in employing the method. There are a small number of heap leaching sites in Australia and elsewhere. But by far the greatest expansion of heap leach operations has occurred in the US, particularly in the Western states. The amount of gold produced in the US by heap leaching rose nearly twenty-fold throughout the 1980s, accounting for six per cent of supply at the beginning of the decade and over 33 per cent at the end. In 1980, there were perhaps two dozen heap leach facilities in the US; by 1991, there were 265, of which 151 were active.[25] The enormous growth in US gold production in this period — 31 tonnes in 1980, 295 tonnes in 1990 — is largely attributable to cyanide heap leaching.[26]

Heap leach operations are fraught with hazards. Cyanide is extremely poisonous and can be harmful or lethal to people, wildlife and plants. Symptoms of acute poisoning in humans range from nausea, headaches and dizziness to breathing difficulties, convulsions and loss of consciousness. Very small doses of cyanide are fatal if ingested, inhaled or absorbed.

Heap leaching also releases other toxic substances. Heavy metals including lead, cadmium and mercury, as well as metalloids such as arsenic, are frequently in ores and can be mobilized by crushing and leaching. Cyanide degradation releases nitrates and other nitrogen compounds that can contaminate water sources.[27]

Cyanide contamination of the environment around heap leach sites is possible from leakage through liners which have been worn by the enormous weight and movement of ore, ripped by machinery, or which have been carelessly installed.[28] Moreover, open pads and storage ponds can overflow and spill cyanide solution into the surrounding ecosystem. Although cyanide breaks down gradually in most soils and air, in some circumstances it remains undegraded for years.[29]

Throughout the US, there have been numerous reports of overflow spills and leaks from both pond and heap pad liners. In Nevada, the state with the most heap leach sites, cyanide spills at mines happen on average once a week.[30] Since 1982, according to the Technical Information

Project in South Dakota, almost four dozen cyanide leaks or spills associated with mining companies have occurred in a single county of that state; in one incident, a company's supposedly state-of-the-art leach pad was leaking cyanide solution at a rate of up to some 5,000 gallons per day.[31]

For people living near heap leach facilities, contamination of water supplies is a potential danger. In 1989, 92,000 gallons of cyanide solution spilled from a leach unit in California and polluted a reservoir used for municipal, recreational, and agricultural purposes. In Montana, a leak from a cyanide solution pond tainted neighbouring tapwater. Elsewhere in Montana, in the Little Rocky Mountains, cyanide from the state's largest gold mining operation is reportedly entering the aquifer of the Fort Belknap Indian Reservation, home to 5,000 Gros Ventre and Assiniboin peoples. There is great anxiety about the company's plans to punch holes in the heap leach liner when mining ends to allow drainage for hundreds of millions of gallons of cyanide solution.[32]

Heap leach facilities are responsible for the death of great numbers of animals. In 1990, a cyanide leak in Colorado destroyed all aquatic life along 17 miles of one river.[33] That same year more than 10,000,000 gallons of cyanide solution spilled into a South Carolina river, killing up to 10,000 fish.[34] In arid regions birds and mammals are drawn to cyanide solution ponds as a water source. The US Fish and Wildlife Service estimates that from 1986 to 1991, heap leach operations poisoned over 10,000 animals in Nevada alone.[35]

Philip M. Hocker of the Washington, DC-based Mineral Policy Center has written: "We are spraying tens of thousands of tons of one of the most acute poisons known to man across the landscape. There will be more deaths if this program is not strictly controlled and the dead will not all be birds and animals."[36] The development and implementation of controls is not stringent enough to protect against the dangers of cyanide heap leaching, a problem which has so far defied solution and which may be insuperable. The only state with a specific regulatory programme for heap leaching is Oregon and it as yet has no heap leach facilities. Reports from California, Utah and Montana indicate that there are continual environmental violations at heap leaching sites, but the states' regulators are unable to enforce compliance with the law.[37]

Under the best conditions of regulatory supervision and control, cyanide heap leaching would still be a perilous enterprise; under current conditions these activities are potentially disastrous. Given the serious difficulties associated with regulating cyanide heap leaching in the US, it is disturbing to learn that a number of companies are considering, or are already building, heap leach operations in Latin American countries such as Chile. One industry representative acknowledged that Chilean regulations for heap leaching are far less stringent than those of the US. It is difficult not to conclude that the adverse consequences of cyanide heap leaching will multiply outside the US in the future.

Laying Waste

Cyanide heap leaching is frequently associated with another low-cost practice: open-cast mining. To provide the huge quantities of ore needed for heap leach facilities, mining companies dig enormous pits. The hole of one prospective open-cast mine is expected to be 1,500 feet deep, 4,000 feet wide, nearly a mile and a half long, and to involve one billion tonnes of rock.[38] Open-cast mining disturbs 50 times more earth than underground mining to produce the same amount of gold.

In the process, open-cast mining causes extensive ecological damage — stripped vegetation and topsoil, pulverized hillsides and mountain tops — and threatens fish and wildlife with loss of breeding, wintering and feeding grounds. Many of the pits will probably be left unfilled, to remain geological scars for millennia. Inhabitants of Montana's Fort Belknap Indian Reservation say open-cast mining has ruined their spiritual sites, flattened mountains, emptied one stream of fish and clogged beaver dams. "It hurts my heart to see the destruction here," lamented one resident, " . . . it would be easier to lay down and die than to see these mountains go."[39]

The combination of open-cast mining and heap leaching also generates vast amounts of waste comprising soil and rock (overburden) and residual matter from ore concentration (tailings). For gold and other non-ferrous metals, surface mining can generate between two and five times as much waste as it does ore, while up to 90 per cent of this ore ends up as tailings. The waste, and especially the tailings, can contain contaminants such as residual cyanide, acids, toxic organic substances, nitrogen compounds, oils, and metals or metalloids including iron, copper, zinc, lead, arsenic, nickel, mercury and cadmium.[40]

Discharge of this waste into rivers, lakes, or coastal ocean areas, via truck, barge, or pipeline, is a cheap but potentially harmful disposal method. Suspended solids from mining and from the processing of waste cause turbidity in marine ecosystems. Depending on their nature and concentration, these solids can interfere with the self-purification of water by reducing light penetration and obstructing photosynthesis. Fish can be injured by sharply-edged and irregularly-shaped pieces of crushed rock taken in through the gills and become vulnerable to fungi and other infectious agents.[41]

Because of such problems, marine disposal of tailings and overburden is being abandoned in the industrialized world. The US Environmental Protection Agency says there have been no mining operations in the US that discharge waste into rivers or oceans for at least a dozen years. Australia forbids the dumping of tailings or overburden into rivers and while disposal of mining and processing waste into the sea is still allowed, it is being phased out and only one permit for the practice remains.

In the less-industrialized countries, however, the practice is increasing. There are several notorious cases of the damage caused by marine disposal. Near Ilo, Peru, 30 years' worth of marine waste disposal from two copper mines has added an estimated 430 million tonnes of metal contaminants into the Bay of Ite, prompting the community to file a claim against the company responsible (Southern Peru Copper Corporation) with the Amsterdam-based International Water Tribunal.[42]

PNG: A Double Standard

Some of the worst examples of marine disposal have taken place in Papua New Guinea (PNG), where gold production is expected to exceed 100 tonnes by 1995 (up from 34 tonnes in 1990).[43] Over twenty years, the Panguna copper and gold mine on the island of Bougainville, discharged some 600 million tonnes of tailings into the Kawerong/Jaba river system. This pollution helped to kill all aquatic life in

the Jaba River and was an important factor in the island's civil war which shut the mine down in 1989.[44]

But the most infamous case of pollution — so far — is the mine at Mount Fubilan (a spot popularly referred to as the "Pot of Gold") in the Western Province of PNG, better known as the Ok Tedi project. Initiated in the wake of the huge rise in the price of gold in 1980, this project is a classic example of the environmental and social problems that are associated with marine waste disposal. It began with the establishment in 1981 of a consortium, Ok Tedi Mining Ltd. (OTML), the equity of which is shared by the PNG government and companies from the US, Australia and Germany.[45] Although the mine now produces primarily copper, OTML originally planned to mine only gold, and did so from 1984 to 1989.

Initially, Ok Tedi was to be provided with a tailings dam and retention basin that would limit pollution. But when civil strife forced the closure of PNG's largest minerals project at Bougainville, the government suspended the arrangement.[46] As a result, since its inception, the mine has discharged many thousands of tonnes of tailings and waste rock daily into the neighbouring Ok Tedi and Fly rivers, which flow into the Gulf of Papua and the Torres Strait.

The adverse consequences of this discharge are already apparent. The sedimentary load has increased the Ok Tedi's turbidity about 100 times in some parts, blocking out light needed for plant growth and affecting the development of algae, the base of the food chain. According to a study conducted by the Starnberg Institute of Germany, samples from the Ok Tedi/Fly river system reveal that levels of lead, zinc, manganese, iron, copper and arsenic are hundreds of times higher than those existing before mining operations began. Levels for many of these samples exceed European Community standards for drinking water quality requirements.[47]

This contamination will almost certainly cause long-term damage to fauna in the river system. The upper reaches of the Ok Tedi River have experienced a reported 50-80 per cent decline in fish stocks.[48] In 1989, independent researchers, evaluating data on the environmental impact of the Ok Tedi mine for the PNG government, concluded that it should assume that "the river system and fish faunas will not recover quickly following cessation of mining and that such a recovery may take several generations if it occurs at all."[49]

Waste from the Ok Tedi mine is also polluting the Gulf of Papua, where the content of metals such as lead, cadmium and zinc is hundreds of times higher than concentrations found in open ocean waters.[50] There is concern that the waste will harm the breeding grounds of the barramundi, a fish of nutritional and commercial importance. Fish, shellfish and turtles are a staple diet of up to 40,000 indigenous people in the Ok Tedi/Fly river area. In addition, the 5,000 islanders in the Torres Strait, where researchers from Sydney University have found metal contamination in prawns and the sea bed, are among the greatest consumers of seafoods in the world.[51]

Besides posing a human health risk, the Ok Tedi project's marine disposal of tailings and other waste may undermine people's employment and self-sufficiency. Around the Ok Tedi/Fly river system, the waste threatens the populace with reduced fish stocks and less fertile agricultural land. In the Torres Strait, the prawn industry is the islanders' major economic resource, with an annual value of US$14-18 million. "The oceans are a lifeline for Torres Strait islanders," Gentano Lui, Chairman of the Torres Strait Island Co-Ordinating Council, has asserted, "and this situation could destroy the 20 communities in the island region."[52]

Referring to Ok Tedi, an anonymous mining official told the authors of the Starnberg study: "Mining in this form would not be allowed either in Australia, the USA, or the rest of the western world."[53] After it reviewed the Ok Tedi project in 1992, the International Water Tribunal recommended: "If no such storage or no cost-effective storage is feasible, the jury believes that the externalized costs of the project exceed the benefits and, consequently, the activities of OTML should be phased out."[54]

Unfortunately, the example of Ok Tedi's reckless waste disposal method has set a precedent for other large gold mining projects in Papua New Guinea. For example, the nearly completed Lihir Mine on Lihir Island is scheduled to discharge aboutn 330 million tonnes of tailings and overburden into the sea. The Porgera Mine in Enga Province, where construction began in 1989 on what is expected to be one of the world's biggest gold producing sites, plans to dispose of tailings and probably other waste into the Strickland River, a tributary of the Fly. The Misima Mine on Misima Island is already discharging tailings directly into the ocean via a pipeline several hundred feet below sea level. There are at least four other gold projects in the exploration stage and no indication, according to the Starnberg report, that they "will adopt a different approach to that of containing costs by damaging the social and physical environment."[55]

Disproportionate Destruction

Countries such as Papua New Guinea are now undergoing a similar invasion to that experienced by South America in the 16th century or by California in the 1840s. But in an era of paper money and electronic cash, the incongruity of this new gold rush is all the more striking. The magnitude and severity of its impact appear out of proportion when one considers how minimal is society's need for gold, and how difficult it is to justify the production of gold in comparison to, say, food or timber. Greed alone cannot account for this activity; the intangibility of investor anxiety, the volatility of gold's international market price, and the infectious nature of the desire to hoard, all suggest that more complex forces are at work.

Nevertheless, the new gold rush does reveal, in an elemental way, the connection between commerce and damage to the environment. Decades hence, historians will write of the late 20th century gold rush. People in the future will remember this frantic search for bullion because they and the global ecosystem will still be suffering its harmful consequences. Whatever the New York Commodity and London Metal Exchanges now happen to register, those consequences will constitute the true price of gold.

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Environmental Valuation

How Much Is the Emperor Wearing?

by
Andrew Stirling

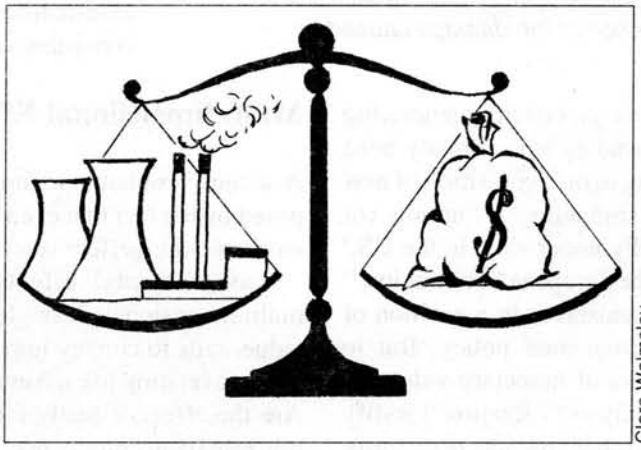
Economists who propose the monetary valuation of environmental effects aspire to produce an objective yardstick for use in policy-making. Yet separate attempts to assign a monetary value to the environmental effects of specific electricity-generating technologies have differed from one another by a factor of as much as 50,000. Discrepancies of this order suggest the existence of fundamental flaws in the basic approach. The complexity of environmental phenomena cannot be expressed by means of a single numerical index, nor can the different perspectives held by various analysts, policy-makers and members of the public ever be reconciled into a single structure of preferences. The adoption of monetary valuation threatens to remove key aspects of environmental decision-making from the sphere of public debate and place it in the hands of a small community of technocrats.

"We are at a point in the evolution of environmental policy at which the economics profession is in a very favourable position to influence the course of policy."

M. L. Cropper and W. E. Oates, 1991

"What in observation is loose and vague is in information deceptive and treacherous."

Francis Bacon, 1621



Clare Walmsley

Modern industrial production causes many forms of environmental damage. There is now strong political pressure to develop credible means to quantify, compare and rank the effects of different technological strategies. Failure to achieve this implies a loss of rationale, and thus of legitimacy, for the environmental regulation of industry. Success will bestow enhanced status upon the favoured community of specialists and an extension of their influence at the expense of competing disciplines. For both policy makers and academics, the stakes are high.

With a rise in the profile of environmental issues over recent years, the pressure has intensified. A wide range of specialists have proposed various approaches: cost-benefit analysis,[1] comparative risk analysis,[2] multi-criteria analysis,[3] decision analysis[4] and environmental impact assessment[5] are among the principal contenders. Efforts have been made to arrange the proliferating number of variants, hybrids and reincarnations as a single palette of techniques, each with its own legitimate domain of application.[6] Nevertheless, a large degree of redundancy persists. Adherence to any one of this set of competing policy tools is often determined more by the disciplinary affiliations of the analyst than by the merits or shortcomings of the method itself.

In the present climate of liberalization and deregulation, neoclassical economics has emerged as an aspiring colonist of this tantalizing but hazardous intellectual territory. Drawing on the concept of social cost introduced by A. C. Pigou,[7] economists have characterized environmental damage as a loss of utility to society as a whole. Monetary value has been proposed as the most appropriate index or yardstick for the measurement of the benefits that are foregone as a consequence of damage to the environment. In the case of those environmental effects which remain unpriced in any market, the problem is to derive monetary values by various analytical means.

Where the economic cost of a reduction in environmental benefits is not included in the price of a commodity, the value of the lost benefits is said to be "external" to that price. Economists view this as a classic case of market failure: their prescription for countering environmental damage is to incorporate these costs into the market price through taxation or other regulatory mechanisms. In this way, they claim, the allocation of resources is optimized with respect both to economic and environmental factors.

It is this intellectual framework which underlies much recent activity in the debate over the regulation of the electricity supply industry. Over the past four years, governmental bodies such as the European Commission, the US Department of Energy and US state regulatory agencies have commissioned a series of studies with the aim of deriving monetary values for the external

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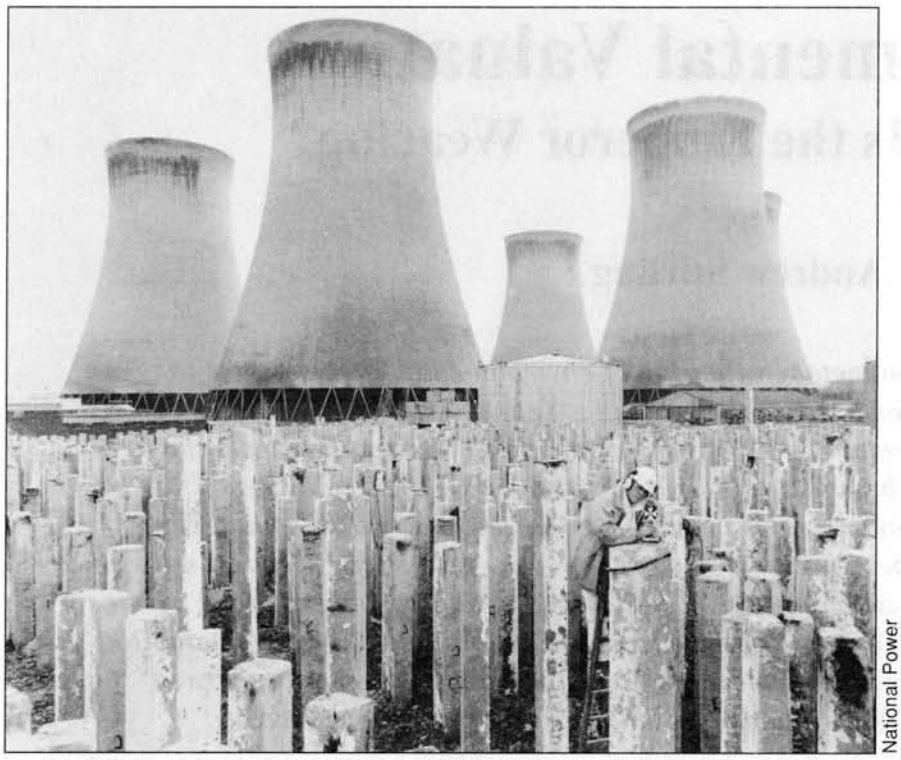

National Power

Foundation piles for the £700 million flue gas desulphurization plant at Drax power station which will control sulphur dioxide emissions. Are such costs an accurate reflection of the damage caused by pollution ? . . .

environmental costs of the various electricity generating technologies.[8] The results of such studies have already been taken as a basis for legislation relating to the acquisition of new plant. Further and more detailed monetary valuation (or "monetization") studies are reportedly under way, in the US,[9] and for the British Government[10] and the European Commission.[11] Economists are beginning to find themselves in a position of unprecedented influence over environmental policy. But to what extent do the intellectual merits of monetary valuation (which I will henceforth refer to simply as "valuation") justify its current political ascendancy over other attempts to quantify and compare different environmental effects?

Inconsistent Classification

There are a number of problems common to all attempts to quantify environmental effects. The first of these involves classification. Before any scale of measurement is selected (be it money or some other index) the different classes of environmental effect must be accurately characterized in order to avoid duplication or omission. No comparison can be made between studies if they employ different frames of reference.

Yet the classification of environmental effects remains in a chronic state of confusion. In 1983, the OECD noted that few of the published attempts to classify environmental effects were mutually consistent and urged greater care in distinguishing between different classes of harm.[12] For example, "environmental effects" often overlap with "social" or "health effects"; ambiguities in the use of such fundamental terms mask important discrepancies in the scope of different analyses.

Individual classes of effect have variously been defined under the following headings:

- the medium that is physically affected (eg., land, water, air);
- the agent of harm (eg., emissions, residual pollutants);
- the stage in the fuel-cycle or the life-cycle of a facility (eg., mining or decommissioning);
- the form of the risk (eg., catastrophic or routine);
- the manifestation of harm (eg., extinction of species, human illness).

Any one of these organizing principles might be employed to order the set of all environmental effects in its entirety. Conversely, a single effect may legitimately be classified under all. For example, the contamination of a water-course by liquid emissions originating in a catastrophic accident during the construction of an industrial facility may lead to the extinction of a highly localized species.

Where there is confusion over the identification of the various forms of environmental effect, there is a high probability of omitting or duplicating important factors. Efforts to quantify and aggregate environmental externalities are therefore unlikely to yield consistent, comprehensive, or comparable results.

Multidimensional Effects

A second problem common to all quantification techniques is posed by the fact that even the most apparently straightforward environmental effect is an extremely complex phenomenon.[13]

Environmental effects are inherently and irreducibly multidimensional. A single numerical index, such as monetary value, fails to convey important contextual information.[14] Are the data relating to each evaluated technology of equal quality? Are the effects equally familiar to society, and are efforts to mitigate them equally psychologically and socially disruptive? Are there discrepancies between the perceived interests of specialist communities associated with particular technologies and those of society as a whole? Can the consequences of the effects posed by each of the evaluated technologies be avoided, through action taken either before or after their occurrence? Are the effects equally immediate or is, for instance, injury more preponderant with one technology, and disease with another? Is there a direct relationship between the effect and its cause, or does it result from the interplay of complex forces? Is the social distribution of risks correlated with the distribution of associated benefits? Do any of the evaluated technologies pose greater risks to future generations than others? Do all pose the same ratio of occupational to public risks? Or of risks of death to risks of injury and disease? Are the effects associated with the evaluated technologies all equally reversible? How do the range and distribution patterns of the different effects compare? Do certain of the evaluated technologies pose risks of catastrophic effects on a scale unmatched by other technologies? Are the technologies all on identical trajectories in terms of any change in their riskiness? Do their effects differ in the degree of site-specific variation from the estimated norm?[15]

The nature of the risk posed by an individual electricity supply technology depends on each of these factors and many others. As dawns eventually on any child with a "peg and hole"

toy, an ordinary three-dimensional object cannot satisfactorily be characterized in terms of a single parameter such as its "length", its "breadth", or its "depth". In the same way, no one dimension of an effect can adequately convey the totality. Though they may have a superficial appeal, approaches which recognize only a single dimension are as likely seriously to mislead in environmental assessment as they are in everyday measurement.[16] Likewise, the omission of even a single dimension may lead to a seriously deficient understanding of comparative effects.

In the face of these and other difficulties, aspirations "objectively" to quantify, aggregate and compare different classes of environment effect are being superseded in some quarters by more pragmatic aims. One study for the European Commission concludes that aggregation and comparison must necessarily be regarded as political functions, and left to decision-makers rather than specialists.[15] Another EC study, recommends moving away from quantitative cost-benefit analysis toward more qualitative environmental impact assessment.[16] The proponents of monetary valuation, however, proceed as if oblivious to these difficulties.

Pete Addis/Environmental Picture Library

. . . Or do the costs of building new sea-defences to mitigate the damage caused by rising sea-levels give us an reliable measurement of the damage caused by global warming?

Methods of Valuing Environmental Effects

There are many ways of applying a monetary value to environmental effects. Conventionally, three broad approaches are recognized.[17] One unashamedly pragmatic method is to assume that some form of equilibrium pertains, and take the costs of abating, (ie. preventing), harmful effects as a measure of the external environmental costs thereby avoided. Advocates of this approach argue, for example, that the costs of installing flue gas desulphurization equipment in a power station may be taken to represent the costs of the pollution thereby avoided. In such cases any pollution that remains unabated, or even unrecognized, by those in a position of responsibility will remain unaccounted for. Where the object of the valuation exercise is to optimize the allocation of resources for pollution control, taking existing abatement costs as a proxy for damage costs embodies a certain circularity of logic.

A second approach assumes that the cost of mitigating — rather than abating — environmental damage reflects the cost of the damage itself. For example, the depletion of fish stocks by marine pollution can be valued by measuring the increased investment in boats and equipment.[18] However, the estimated costs of mitigating damage tend to cover only those situations where the burden on individual economic actors — and the prospect of relief — are high enough to warrant expenditure. Fishing boat owners may respond to declining catches by selling up rather than increasing investment. Where mitigation costs do not account for damage which is irremediable or too expensive for any affected party to take mitigatory action, they can be taken only as a partial reflection of the total costs of environmental damage.

A third approach seeks to establish empirically the full social costs of the environmental damage itself. Unlike abatement costs or mitigation costs, efforts to determine damage costs at least hold out the prospect of yielding systematically comprehensive values. Unfortunately, this approach is more intractable. There exists a multitude of techniques for assessing damage costs. For instance, a distinction is often drawn between "direct" and "indirect" methods. The "direct" methods include those which:

- establish a value for an "environmental asset", such as a National Park, in terms of the aggregate expenditure on travel (and, sometimes, travel time) by its visitors;
- derive a value by reference to "surrogate" or "hedonic" markets where, for instance, property prices or wages may be seen to take account of the value of environmental or health benefits or disadvantages which are associated with a particular property or job, and;
- conduct "contingent valuation" (CV) by establishing "experimental markets" through responses to questionnaires by sample populations. Respondents state hypothetical monetary values which they would be willing either to pay or to accept in order to secure or forego an environmental benefit, or prevent or tolerate an environmental disbenefit.

An attraction of CV techniques is that they offer the prospect of capturing otherwise intangible benefits, such as those due to the very existence of an environmental amenity (irrespective of its "use"), those associated with the desire to bequeath it to posterity, or those arising from the intention of securing an option on its future use.[19]

"Indirect" damage cost approaches, by contrast, seek to sum the substantive economic costs incurred by all the individual environmental effects. Some of these cost items may be expressed in terms of the market prices for goods and services required in replacement or restoration. These may be assessed by establishing dose-response relationships between the causes and the manifestations of harm. More complex cases, however, must be

ascribed a value by the analyst, which will involve the use of "direct" valuation techniques such as those discussed above.

Unfortunately, the terms "direct" and "indirect" are used in contradictory ways in different areas of the literature, a situation which does not inspire confidence that the framework for the valuation of environmental damages is yet methodical or consistent. But there are more serious grounds for concern over the analytical (and thus regulatory) utility of valuation.

Difficulties with Contingent Valuation

Contingent valuation (CV) is sometimes felt to offer the prospect of deriving values for multidimensional environmental effects which might otherwise prove intractable to valuation. However, where respondents are completely unaware of certain environmental effects, then CV can hardly be said to address these effects. The degree to which different respondents take account of the same effects or dimensions or share the perspective adopted by the analyst remains unexplored. There is thus no way of knowing what fraction of the complete array of dimensions and effects are accounted for.

CV also suffers from more specific difficulties. One important example concerns the discrepancy between the answers to questions focussing on "willingness to pay" and to those focussing on "willingness to accept". Respondents generally cite significantly lower values for what they would be willing to pay in order to secure a particular environmental benefit, than for what they are willing to accept as compensation for its loss. According to one exasperated observer, it took thirteen years of research and sixteen replications before the discrepancy was treated seriously.[20]

Some enthusiasts are still so confident in CV that they prefer to contest the validity of empirical results than to question the theoretical framework itself.[21] But in fields other than economics, such deviations from the behaviour predicted by formal economic theory are regarded as unsurprising. Phenomena dismissed by economists as "cognitive dissonance",[22] are familiar to social psychologists in the guise of concepts such as "loss aversion".[23] It is readily explicable that an individual assigns greater value to attributes with which she or he associates, than to those same attributes prior to any association.

Critical appraisal of CV studies shows that circumstantial factors such as the structure of questionnaires[24] and the demeanour of the questioners may exert a profound influence on results. Far from being passive sources of data, respondents may seek actively to influence the results of studies through various forms of "strategic behaviour". Where rich respondents tend to bid higher values, attributes prized by more affluent communities are likely to be valued more highly in CV. In short, so sensitive is CV to the subjective social and psychological circumstances of respondents and to the contexts of the studies themselves, that some have been led to conclude that "the method becomes the message".

The Partial Scope of Valuation Studies

Values for the external environmental costs of electricity have been derived by the use of each of the techniques discussed above. Noting the shortcomings of the alternatives, different analysts tend to favour different techniques. Some advocate taking damage cost figures such as those generated by contingent valuation or hedonic prices. Others argue instead for taking abatement costs. Some studies draw on a mixture of techniques, thus combining the deficiencies of all. Results generated by different methods diverge to an "unexpectedly" large extent.[25]

The various approaches are often deployed in a somewhat *ad hoc* fashion. There is a tendency to select different techniques for different environmental effects, exacerbating the inconsistent classification of the effects themselves. Important stages of the fuel cycle, or of power station life cycles, (the extraction, transport and storage of raw materials, for example) are routinely excluded.[26] The scope for double counting or omission is compounded by that for misjudgements in the summing of incommensurate valuations. The baroque complexity of the exercise does not make it easy to detect errors. As a result, oversights are committed that would be less likely in more modest (though still daunting) projects such as risk assessment.[27]

The degree to which mitigation costs capture the full scope of a class of environmental effect is also questionable. Certain studies take the cost of liming soil or water as an index of the costs of acid rain, neglecting consequent effects such as those engendered by the extraction of the lime.[28] Others take the cost of improved sea defences on the German North Sea coast as a reflection of the costs of global warming, neglecting the climate effects themselves.[29] Elsewhere, increased investment in irrigation is taken as a representative response to global warming.[30] Such analyses, at best, only partially address those environmental problems they set out to consider.

Rather than making spurious claims to objectivity, policy-makers should acknowledge that calculation is subordinate to judgement

Another crucial issue is the practice of discounting the future. Future benefits are deemed to be financially less valuable than present ones, implying that environmental damage is less harmful the longer it is postponed. For example, the financial benefit of using a superior construction technique to preclude future repairs is not accounted at its nominal value, but at a lower rate to compensate for the delay. The principle can be seen as an economic reflection of the adage that "a bird in the hand is worth two in the bush". It is applied to financial accounts by means of an annual "discount rate", expressed as a percentage. A discount rate of 5 per cent means that that a benefit to be accrued 25 years in the future is assessed at less than 30 per cent of its nominal value.

The chosen discount rate can thus exert a profound influence on the results derived for technologies with different temporal distributions of costs and benefits. Yet the choice of discount rate remains little more than arbitrary and sometimes varies even within a particular study.[31] It is often not clearly declared.[32] Without a knowledge of such factors, the meaningful interpretation of the numerical results of valuation studies is rendered extremely difficult.

Although they may sometimes be aware of at least some of these issues, practitioners of monetary valuation tend to make little effort to acknowledge them. Instead, frequent and prominent use of phrases such as "real costs",[33] "full costs"[34] and "true costs"[35] suggest that valuation results are more systematic and comprehensive than even their authors would admit them to be.

Valuation incurs virtually all the uncertainties suffered by other environmental assessment techniques, and adds more of its own. Yet the treatment of uncertainty and variability in results tends to be rudimentary, even compared with the generally lamentable neglect of this problem in other areas of the environmental assessment literature. Valuation results are often expressed with considerable precision.[36] Precision, however, is no guarantee of accuracy.

Theoretical Difficulties in Valuation

The more optimistic proponents of valuation argue that these difficulties will one day be resolved. Such defences fail to explain why valuation is currently so influential amongst policy-makers. Moreover, the theoretical basis for valuation is itself deeply flawed; the extension of the "dubious theology"37 of economics to the arena of environment policy raises profound problems.

The first difficulty concerns the very notion of value. The concept is central to economic theory — in one caricaturist's words, "there is only one value and its name is utility".[38] Yet economists disagree amongst themselves as to its meaning;[39] it would seem that the value of an attribute is inextricably dependent on the context of that attribute and on that of the valuer. This need pose little problem in the case of market or near-market transactions, where the market itself constitutes a common context both for the valuer and the valued. However, if value is "simply a fleeting shadow of wavering contexts, never absolutely existing, and only meaningful in a relative sense",[40] then the concept is ill-suited for use in environment policy, where decisions may have extremely long-term, wide-ranging and profound consequences, far removed from any market.

Second, can the value of environmental attributes properly be expressed in terms of the price society is willing to pay to avoid destroying them? Or does the environment possess some "intrinsic" value in itself, reflecting the benefits secured by non-human organisms? If the latter is the case, then even contingent valuation, which, it is maintained, addresses existence values from the point of view of human respondents, will fail to account for these broader intrinsic values. Although all perspectives are open to the charge of being "sociocentric", valuation differs from other approaches to environmental assessment in that its central index (monetary value) has no meaning whatsoever beyond the confines of certain human societies. The measures employed in other approaches (such as pollutant burdens, mortality, morbidity or toxicity) at least enjoy some substantive physical basis. Although concern for the well-being of non-human life is central to modern environmentalism, this principle seems to lie beyond the analytical scope of valuation.[41]

Third, economists sometimes protest in defence of valuation that a failure to ascribe monetary values to environmental attributes implies that such attributes are of infinite value.[42] Elsewhere it is claimed that a failure to "monetize" implies the ascription of no value at all.[43] Ignoring any contradiction, if either argument were valid, it would do no more than highlight a phenomenon at the heart of human experience. It is obvious that the refusal of a parent to ascribe a monetary value to their child need no more be seen to indicate a zero valuation than it does an infinite valuation. Certain forms of value are simply beyond price. Far from being an inconsistency, this offers an everyday

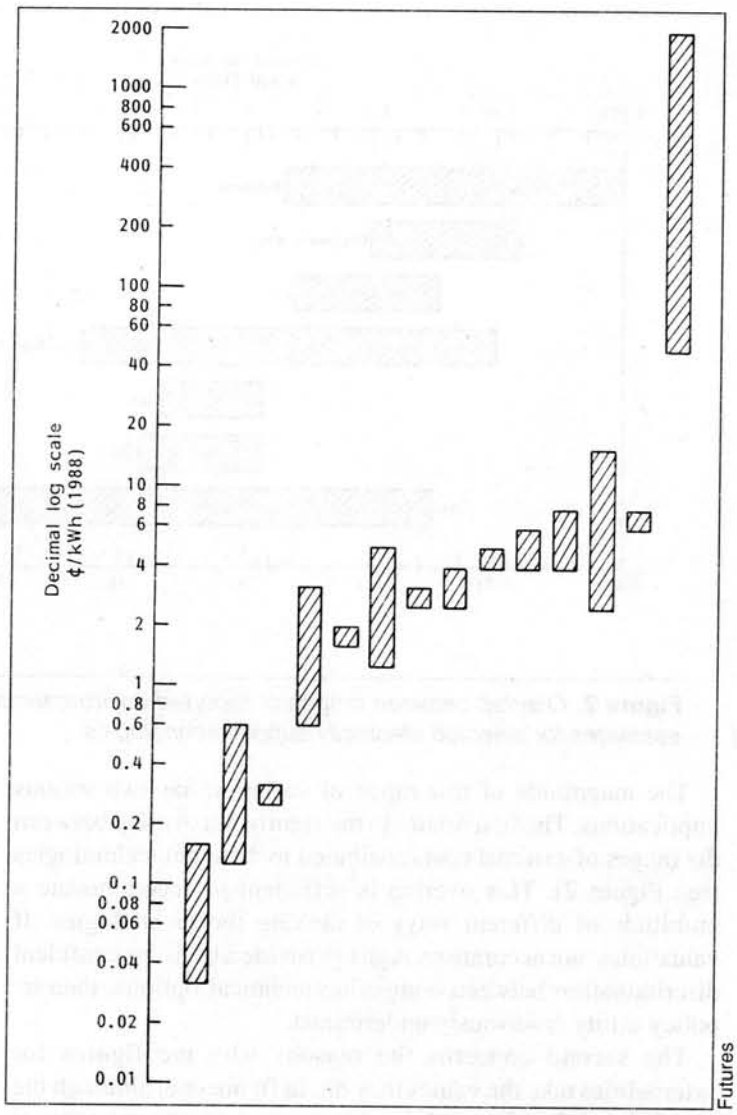

Figure 1. *Range of selected estimates of environmental costs of coal-fired electricity generation.*

illustration of the difficulty of characterizing an multi-dimensional whole by means of a one-dimensional index. Although there undoubtedly exist monetary components to the value of many environmental attributes, it is both naive and perilous to take these as a reflection of the totality. Attempting to encapsulate environmental quality in a monetary value is like trying to measure the width of a temperature, or divine the velocity of love.

The Practical Results

The discussion so far has highlighted grounds for concern over the valuation project. To what extent are these borne out in practical results? A large number of studies look at the external costs of coal-fired electricity — many more than for any other power-generating technology. The lower and upper bounds to the published range of results of these studies differ by a factor of more than fifty thousand (see Figure 1[44]). Although different analysts in any discipline will employ different frames of reference, use different data, and adopt different assumptions, or methodologies, a range of variation exceeding four orders of magnitude is difficult to explain in these terms. At the very least, the scale of the disagreement suggests that the accuracy of valuation does not match the precision with which individual authors express their results.

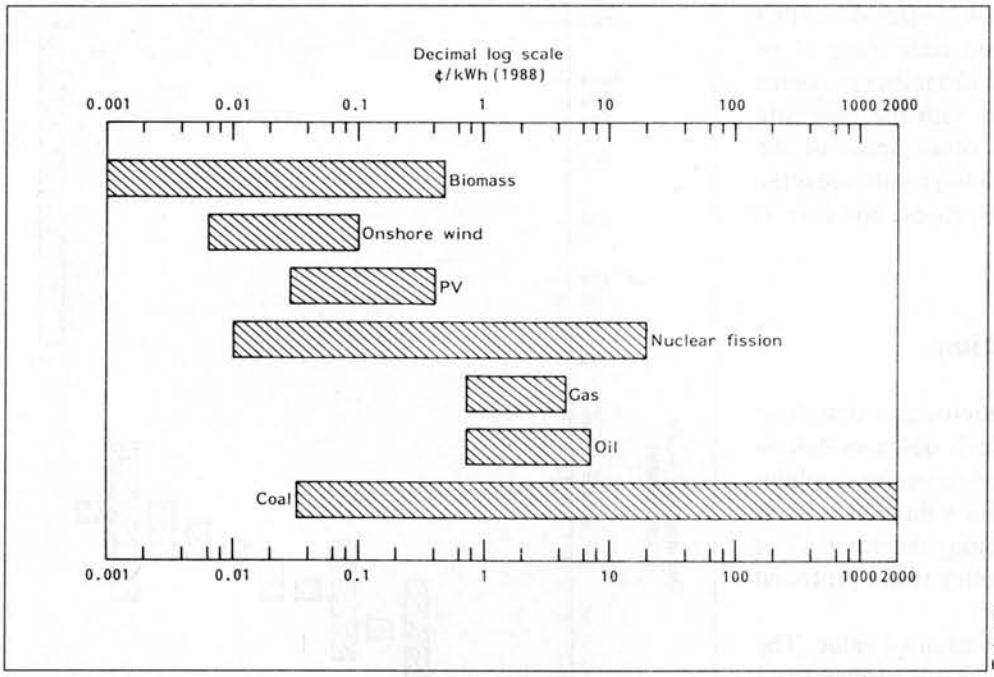

Figure 2. *Overlap between ranges of reported environmental externality estimates for selected electricity supply technologies.*

The magnitude of this range of variation has two serious implications. The first relates to the significant overlap between the ranges of external costs attributed to different technologies (see Figure 2). This overlap is sufficient to accommodate a multitude of different ways of ranking the technologies. If valuation is not accurate enough to provide a basis for confident discrimination between competing technical options, then its policy utility is seriously undermined.

The second concerns the reasons why the figures for externalities take the values they do. In figure one, although the total range of all the estimates is very wide, the majority of published results cluster around the established market price of electricity (Figure 1). This is precisely the range of values which might most readily be incorporated into market prices as an environmental "tax". Values much higher than this would not be directly usable, since the effect of increasing electricity prices by factor ten might be thought to be prohibitive. Values much lower than this would be too small to encourage tangible behavioural changes.

Those seeking a reason for what appears to be a convenient correlation between valuation results and market prices are left with an invidious choice. Are these "accurate" results which suggest mysterious natural mechanisms linking the physical world and the market economy? If so, it is curious that this phenomenon is not often cited as an endorsement of valuation. Alternatively, are there powerful social mechanisms acting on valuation researchers which ensure that valuation results tend to lie in the range most useful in policy-making? Failing either of these, this strange correlation could, of course, simply be coincidence.

The Social Implications of Valuation

The impetus for the development of valuation and other approaches to environmental assessment lies in a belated recognition that orthodox economic analysis since the Industrial Revolution has failed to take adequate account of the environment. Rather than acknowledging that this failure may reflect shortcomings in the discipline of economics, those who advocate valuation have taken the opposite route. Their central thesis is that the environment has been neglected because the concepts and rationale of neoclassical economics have not been applied extensively enough. The notion of monetary value, they say, should be extended from the domain of the economy to the domain of the environment.

Aspirations to reduce complex problems and relationships to simple numerical terms are far from new. Analysts have always been prone to "confuse things that are countable with things that count".[45] Seduced by the facility of calculation, they tend, in Landsberg's words, "to become fascinated with the numbers that emerge and to look at them as real-world, mutually independent variables rather than as the end result of a large number and variety of non-verifiable hypotheses and sheer guesses".[46] Such a tendency is manifest among the more credulous proponents of environmental valuation

Monetary valuation is *scientistic* in the sense that it relies for its authority on the willingness of policy makers and the general public to accept the validity of ostensibly precise numerical results as adequate expression of complex, context- dependent and multidimensional qualitative issues. It is also *technocratic*, in the sense that it delegates important political judgements to specialists to an extent greater than other techniques and so is even less transparent to informed public scrutiny and consent. Such defects are also shown by risk assessment and energy-demand forecasting. Historically, each has proven highly vulnerable to manipulation by powerful institutional interests, such as those of the nuclear industry. Just when environmentalists have largely succeeded in discrediting such procedures, well motivated environmental economists risk presenting a new and even more attractive opportunity to industrial special pleading.

The alternative to valuation lies in acknowledging the fundamentally multidimensional character of environmental effects. The complexities of nature and human society are better represented by a number of decision making criteria. Such criteria are far more effectively identified and prioritized through wide political debate, than by small communities of specialists with minority conceptions and interests. Rather than making spurious claims to objectivity, policy-makers should acknowledge that calculation is subordinate to judgement — that the selection and ranking of environmental criteria are inevitably subjective. Although a plural society is unlikely ever to reach consensus over the final choice of criteria, such an admission would at least provide a basis for more accessible political debate.

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Civil War in the Sudan

From Ethnic to Ecological Conflict

by

Mohamed Suliman

The return of civil war to the Sudan in 1983 is generally regarded as an ethno-religious conflict between northern Muslim Arabs and southern Christian black Africans. While this was true for the Sudan's first civil war, ecological degradation over the past three decades, mainly caused by large-scale mechanized farming, has added a new dimension to the old conflict. The collapse of the subsistence economy of the huge Sahelian region in the North of Sudan as a result of climatic change and the exploitation of natural resources by the merchant class is the driving force behind the biggest onslaught so far by the mainly northern Sudanese élite on the peoples of the South.

The Sudan — like the rest of Africa — is huge and diverse. Its 25 million people comprise 132 tribes and sub-tribal groups in a country of 2.5 million square kilometres, the largest on the continent. Peoples of Arab origin form the majority in the desert scrublands of the North, while black Africans predominate in the high-rainfall savannah of the South, with mixed tribes living in the Central low-rainfall savannah area.

An estimated 40 per cent of Sudanese are "Arab" in a cultural rather than racial sense, being a mixture of Arab, Nuba and black African. The Arab tribes in central Sudan are mainly riverain farmers, while farther away from the Nile live Arab pastoralists and rain-dependent farmers. In the scrubland of the North and West roam camel-breeders, and south of them, the Baggara Arabs herd cattle. The *Jellaba* are the urbanized trading class, who have spread all over the Sudan and into neighbouring countries. They have traditionally been the wealthiest group in the country and still hold considerable economic and political influence. Northern Sudanese of non-Arab descent comprise about 30 per cent of the population, the great majority of whom are Muslims, including the Nubians, the Beja, the Nuba and the Ingessana.

The southern Sudanese, who account for the remaining 30 per cent of the population, consist of two main groups: the Nilotic group of primarily cattle-herding Dinka, Nuer and Shilluk who inhabit the central grasslands of the South; and tribes which cultivate the wooded lands along the southern borders, many of whom are Christian or animist.

When North meets South

As the Sudan is so vast, most tribes have lived in relative isolation from each other, developing strong ethnic identities. When Southerners confront Northerners, their identity with their region and self-image as black Africans tends to come first. At a local level, however, tribal attachment is predominant, and long and bitter conflicts have often divided neighbouring peoples. In the North, regional and tribal loyalties often give way to class-based distinctions. These groups — army officers, the *Jellaba* and those with a secular-education — comprise what have been described as the "Sudanized" groups, who share a common language (Arabic), religion (Islam) and cultural code (a hybrid of northern riverain cultural values).[1]

In the 19th century, the northern *Jellaba* and their private armies collaborated with the Turkish rulers of the Sudan in invading and plundering the South, brutally enslaving thousands of its peoples. The experience of such aggression by Arab Muslims against black Africans magnified and distorted cultural and ethnic differences, leaving a lasting sense of grievance, suspicion and mistrust.

In 1898, a coalition of British and Egyptian forces conquered the Sudan, setting up a colonial state which sought to establish "the rudiments of a modern capitalist economy whilst at the same time opposing its full blown indigenous development."[2] In the North, the British concentrated on economic, political and infrastructural developments such as the Gezira cotton scheme, the railways and the introduction of modern civil administration. But the South, after the British had gained control of the region through violent military expeditions, remained under the "native administration" of local chiefs and sheikhs who maintained tribal structures. This "Southern Policy" isolated the South from the North and the rest of the world.[3]

In the run-up to Independence from the British in 1956, however, southern chiefs agreed with northern nationalists to pursue a united Sudan. "The crash programme of integration that then occurred was too little, too late . . . In the south, 'Sudanization' was tantamount to 'Northernization'".[4] The Southerners regarded the sons of the *Jellaba* slave traders, the new administrators, as new colonialists. Ethnic friction led to hundreds of northern traders, professionals, teachers and others being killed in the massacres which swept through the South in 1955. That same year, the mutiny of an army garrison in the South formed the nucleus of the Anyanya separatist movement, which fought Sudan's first civil war, lasting 17 years.

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Peace and Exports

A short-lived, communist-inspired coup in July 1971 against President Gaafar Nimeiri — who came to power in 1969 promising a socialist path to development — prompted him to embrace the West and the "free market". International backing to rebuff the coup attempt was "paid back" with the declaration of an "open-door" policy whereby all barriers to the movement of foreign capital were lifted. The *Jellaba* claimed that the Sudan would become the "bread-basket" of the Arab world by exporting sorghum and other food crops, using easily-available "petro-dollar" loans from the Middle East, tractors from the West, and Sudanese labour and land — the fertile southern savannah plains of acacia trees and tall grass where rainfall is regular.

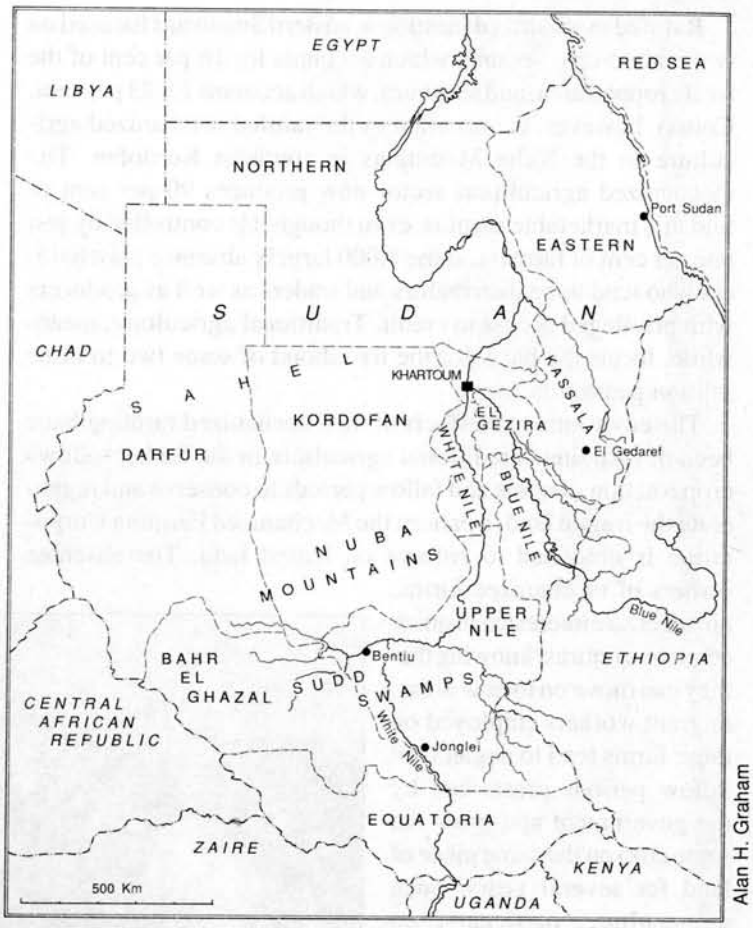
For this expansionist drive to succeed, peace in the South was crucial. Thus in 1972, the leader of the Anyanya movement and Nimeiri signed the Addis Ababa Accord, which, in theory, recognized autonomy for the South and ended the civil war. The battle for resources, however, continued.

After Independence, the *Jellaba* shifted their attention from the power-driven, pump-irrigated cotton schemes of the 1950s towards large-scale rainfed mechanized farming of food crops. Small mechanized farming schemes were introduced in the Sudan after World War II in northern Gedaref in the east of the country, despite the area's low rainfall.

The Mechanized Farming Corporation was established in 1968 to channel the World Bank's first loan to the "supervised" agricultural sector and to survey, demarcate and allocate land for mechanized farming. The 1970 Unregistered Land Act "nationalized" land in theory by declaring that occupied or unoccupied, it belonged to the state if it was not registered, and that entitlement could no longer be acquired by long-standing use. In practice, however, the Act privatized communal land on which peasants, herders, nomadic and semi-nomadic pastoralists had made their living.[5] The Government subsequently leased "state land" for 25 to 40 years to mainly absentee landlords at nominal rents for irrigated and rainfed mechanized farming.

Until the early 1970s, however, agricultural production was mainly oriented to the internal market. This enabled the Sudanese to withstand the severe drought of 1972-75 without the emergence of widespread famine. Southern Sudan had remained more or less untouched by mechanized farming because of its historical isolation, the civil war and its poorly-developed transport infrastructure.

By this time, large-scale mechanized farming had spread from eastern Sudan southwards into the central rainland areas of the Blue Nile Province (where agro-pastoralism was the traditional method of land use) and westwards into southern Kordofan and Darfur. Using the 1970 Unregistered Land Act, the state leased large tracts of land to retired soldiers or government officials, entrepreneurs and merchants, and encouraged them to import tractors and plant crops, mainly sorghum, for export. The lease-holders — or, more usually, their employees — tended to move on to the land, pay off or evict farmers, exclude nomads' herds from grazing, uproot and burn the trees and deep-plough the soil with tractors. Lease conditions such as retaining tree belts or creating corridors for the nomads' herds were often ignored. Many entrepreneurs simply started up unlicensed mechanized schemes, including schemes in wildlife reserve areas, without government permission, yet still received government agricultural extension services and fuel quotas.



Alan H. Graham

Despite the rapid increase in cultivated land and volume of exports, Sudan's national debt grew, largely because the value of primary commodities in the international market had declined steadily from the early 1970s onwards, while oil prices had soared to record heights. In 1978, when the economic crisis came to a head, the IMF intervened and negotiated the first of five adjustment programmes in six years. Although the "bread-basket" policy was halted, crop exports were still encouraged and assisted by the devaluation of the Sudanese currency.

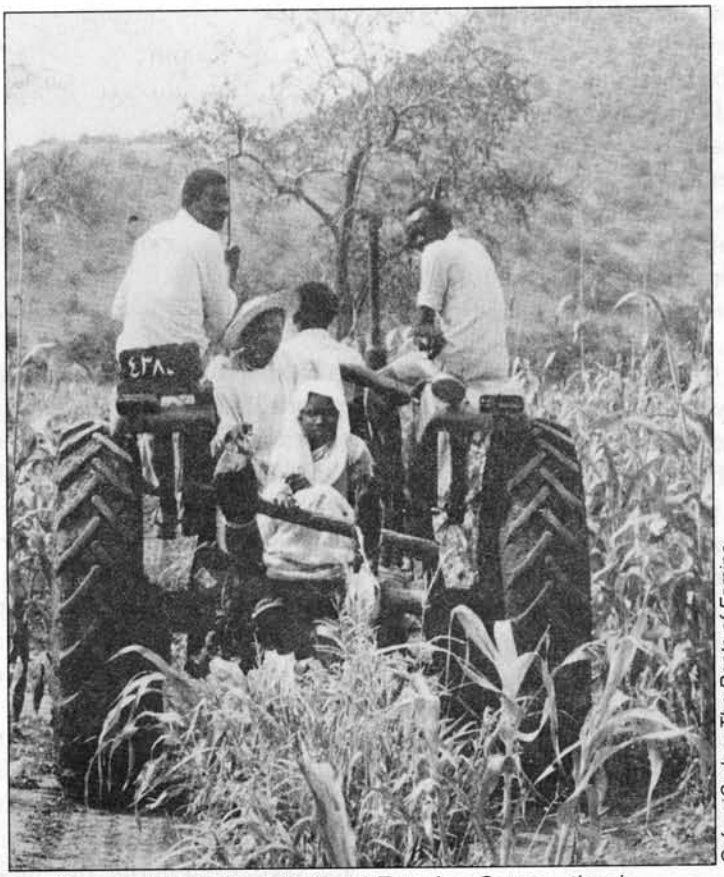
By 1981, sorghum, the easiest and most profitable crop to grow and the country's staple food, had become the Sudan's second largest export after cotton, an increase encouraged by import subsidies in Saudi Arabia, which paid $220 per tonne for Sudanese grain compared to only $170 per tonne for sorghum from Thailand. IMF pressure on the Sudan to export continued unabated, even during the famine years of 1982-85, when the Sudan exported 621,000 tonnes of sorghum.

Mechanized Monoculture

The total area under "legal" or licensed large-scale irrigated and rainfed mechanized farming increased from less than half a million hectares in 1968 to about 2.5 million hectares between 1982 and 1985, jumping to 3.75 million by 1986. Today, the area under legal and illegal mechanized farming (around 7.5 million hectares) far exceeds that under traditional rainfed agriculture (3.8 million hectares).[6] Mechanized farming, as practised in the Sudan, involves tractors but no other machines; usually only ploughing and seeding are mechanized, while land clearance, weeding, planting and harvesting continue to be done by hand. In contrast to "Green Revolution" agriculture, no inputs such as fertilizers or pesticides, organic or chemical, are used.

Rainfed mechanized farming in eastern Sudan has focused on two main crops: sesame, which accounts for 16 per cent of the total cropped area, and sorghum, which accounts for 83 per cent. Cotton, however, is important in the rainfed mechanized agriculture in the Nuba Mountains in southern Kordofan. The mechanized agricultural sector now produces 90 per cent of Sudan's marketable surplus, even though it is controlled by just one per cent of farmers, some 8,000 largely absentee leaseholders who tend to be distributors and traders as well as producers with privileged access to credit. Traditional agriculture, meanwhile, forms the basis for the livelihood of some two to three million peasant farmers.[7]

The environmental effects of this mechanized farming have been devastating. Traditional agriculture in the Sudan follows crop rotation systems and fallow periods to conserve and regenerate the fragile land, a pattern the Mechanized Farming Corporation is obligated to enforce on leased land. The absentee owners of mechanized farms, however, are interested in quick economic returns; knowing that they can move on to new areas, migrant workers employed on these farms tend to neglect the fallow periods prescribed by the government and grow the same crop on the same piece of land for several years. Such monoculture, particularly on marginal soils with low rainfall, degrades the soil quickly. Productivity is high in the first two to four years, after which yields start to decline; the severely exhausted and eroded land is abandoned around the seventh year when yields fall below profitable levels.



Oxfam/Sudan: The Roots of Famine

A tractor of the Mechanized Farming Corporation in south Kordofan.

An estimated 17 million hectares of rainfed arable land in the Sudan — almost half the country's potential arable land — have lost their topsoil and turned to dust, eliminating the prospect of cultivation in the immediate future.[8] The area east of the Nile has been most affected. Loss of tree and plant cover there has exposed the clay soils to wind erosion and compaction, enhancing surface run-off, particularly in the three months when rain falls, often in heavy storms. Loss of plant cover, particularly of trees producing gum arabic, also contributes to overuse of remaining woodlands and bushes; fuel wood and gum arabic are vital local sources of revenue. About 95 per cent of the forests in eastern Sudan have been cleared for mechanized farming. At current rates, all forests in northern Sudan will be gone soon after the turn of the century.[9]

The moderately-degraded Ghadambaliya area in eastern Sudan, abandoned in the early 1960s, is only now being cultivated again, mainly due to its proximity to the newly-constructed tarmac road between Khartoum and Port Sudan. Severely-degraded land will require many more decades of favourable rehabilitation before it can be productive again.

When crop production is less secure, peasants consider animals a good investment. As large mechanized farms have cut into nomads' grazing areas and migration routes, the number of livestock has accordingly risen sharply, contributing further to soil erosion and deforestation. From 1962 to 1983, the number of cattle more than doubled from 9.1 million to 21.4 million, while the number of sheep trebled from 8.66 million to nealy 30 million, bringing the total number of livestock (including goats and camels) to nearly 67 million.

Conflict and Confrontation

The social effects of large-scale mechanized farms have been just as disastrous. Three types of conflict predominate:

- Conflict between traditional farmers and owners of large farms as "cultivators are forced to sell their labour cheaply, pastoral nomads are driven out of the best areas of their traditional pasture . . . and agro-pastoralists are forced to . . . change over to agricultural labour for low wages and a lower standard of living."[10]
- Open conflict among local people living near large farms over scarce cultivable land and fresh grazing land, and over the obstruction of animal herding routes.
- Conflict between the state, as the major backer of the mechanized farm owners, and small farmers and pastoralists.

The blocking of the buffer zone between the semi-desert of the North and the savannah of the South by large, mechanized farms in the central rainlands, along with the consistently low rainfall in the North since 1967, has hastened the disintegration of the way of life of the northern agro-pastoralists.[11] In the arid and semi-arid North, agro-pastoralists, keenly aware of seasonality and water resources, tend to move southwards with their herds during long droughts. Thus:

> "the mere location [of the mechanized farms] in the intermediate land between the semi-arid zone and the rich savannah is a potential source of conflict . . . The whole intermediate land has now been transformed into an arena of conflict not only between the traditional producers but also between the modern and the traditional sub-sectors of the agricultural system."[12]

This traditional seasonal movement into an area occupied by different ethnic groups required delicate negotiations. Agreements used to be reached when the need for sharing land was occasional, but now that the need is permanent, the strains are

greater. During the period of rapid expansion of mechanized farming from 1970 to 1985, more than 20 major regional tribal conferences were organized to solve land disputes among the various ethnic groups in the central rainlands.

Wendy Wallace

After the Sudan People's Liberation Army attacked the Jonglei Canal — and the world's biggest earth-excavating machine — construction was suspended in 1984, with only 250 kilometres of the proposed 360-kilometre canal having been built.

Displacement and Famine

Owing to mechanized farms and Structural Adjustment Programmes, which devalued farmers' monetary assets and reduced subsidies for basic needs and social services, the whole edifice of agro-pastoralism across the central clay plains of northern Sudan, the source of livelihood of 14 million people, began to collapse. With less land available to them and less family labour because of migration, many peasants intensified their traditional cultivation methods, leading to further environmental degradation. This in turn led to an increase in the formal economic role played by women, a role already accentuated by male migration.

By 1984, at least 4.5 million people had become destitute and homeless. The only way for many of them to survive was to migrate to the towns and relief centres, where food was more available — mainly through food aid — and become dependent on begging, charity, occasional labour, theft or prostitution.

State aggression escalated in line with this growing poverty. Arrests, detentions and forced repatriation of the *shamasa* ("those who have no roof but the sun") became common, as did the demolition of squatter settlements. Measures against these uprooted and homeless people became tougher after 1983 when Nimeiri introduced his harsh version of the Islamic Sharia laws. The penalty of amputation, for example, usually for petty thefts, was enforced on 200 people in the first eighteen months, all of them displaced *shamasa*. Despite repatriation, an estimated quarter of the Sudan's population may now be urban.

There were other effects besides displacement. "Not only had the crisis within the subsistence economy deepened, producing a growing poverty of a new type unsupported by traditional systems of redistribution and reciprocity, but the economy had been redirected towards external markets, becoming increasingly vulnerable in the process. The result was the well-publicized famine of 1984-85."[13]

The Move South

The unprecedented exploitation of the central clay region of the Sudan by extensive tractorization, along with persistent drought, led mechanized farm owners, from the late 1970s onwards, to push inexorably southwards into the Nuba mountains and the Ingessena region, with a view to using the areas of the major cattle economies of the Nilotic tribes still further South.

Land was not the only resource they looked for. A limiting factor to agricultural expansion is water. All rivers in the Sudan are part of the Nile waters system, most of which originate either outside the country or in the South, while rainfall, the only other source of water, is widely variable in any one season.[14]

Construction of a canal which would cut across a curve in the White Nile at Jonglei, where the river spreads into the slow-moving swamps of the Sudd, paralleled the agricultural expansion drive in the South. Its construction had been considered since the beginning of this century, making the canal one of the most intensively-researched water projects in the world. Northern élites now coveted not only the water to use downstream but also the vast expanse of fertile marsh land, an area the size of England, that the canal would drain.

A Sudanese-Egyptian joint venture, together with the French consortium Campagnie des Constructions Internationales (CCI), began building the canal in 1978 to "conserve the billions of gallons of water which evaporate each year from the swamp".

However, there had been no serious assessment of what some 1.7 million local people who would be affected by the canal felt about it.[15] Southerners saw the North of the Sudan and Egypt benefiting while their own lives were irreversibly changed for the worse. By drying out the swamps and taking away the "grass curtain", the canal would open up the entire Sudd area for mechanized farming and allow the North to move military equipment and troops into the South with greater ease. The 450,000 Dinka, Shilluk and Nuer who would be directly affected feared that they would no longer be able to migrate to the swamp area during the dry season to fish and to improve the milk yield of their cows; they also feared the prospect of strangers being settled in their midst.

Tensions between North and South grew still further when Nimeiri attempted in 1983 to redraw the boundaries between the two regions so that the North encompassed Bentiu in the Upper Nile province where oil had been discovered by the US oil company Chevron in April 1981. In September 1982, Nimeiri deferred plans to process the oil locally in favour of constructing

a refinery and export terminal near Port Sudan in the North, linked to the oil fields by a 1,400 kilometre pipeline. Recoverable reserves from Chevron's Unity and Heglig fields were estimated at about 236 million barrels, reserves for the whole of the Sudan at 2,000 million barrels.

From Ethnic to Ecological Conflict

By the end of the 1970s, the Northern élite were starting several schemes to use the oil, water and land resources in the South. Renewed civil war was triggered in 1983 when Nimeiri, breaking the 1972 Addis Ababa peace accord, tried to redivide the South, hoping to turn to his advantage divisions among southern politicians and tribes, and introduced his Islamic Sharia laws. That same year, several army mutinies took place, leading to the formation of the Sudan People's Liberation Army (SPLA) under Colonel Dr John Garang, and the formation of the Sudan People's Liberation Movement (SPLM).

Unlike the Anyanya movement of the first civil war, the SPLA announced that it was not fighting for an independent South, but for a unified secular and democratic Sudan. It saw itself as an integral part of the struggle of all the marginalized groups in the Sudan, claiming that it was defending the whole of rural Sudan against the onslaught of the *Jellaba*.

The SPLA/SPLM thus gained the support of many of the rural poor and dispossessed in the North as well as the South — many people from the Nuba and Ingessena have joined its ranks — marking a fundamental transformation of the original North-South division of the country. In this second civil war, northerners are no longer killed indiscriminately, as was the case during the first conflict. Economic exigency has superseded ethnicity.[16]

Hand weeding around sorghum plants in south Kordofan. Ploughing is the main agricultural activity which has been mechanized.

Wendy Wallace

For the NIF, the South is a resource reserve.

The SPLA's first attacks were directed against installations on the Jonglei Canal and oil exploration; Chevron was compelled to suspend work in February 1984, since when oil operations in the Southwest have practically halted.

Having seen how the Nuba were being squeezed off their land in southern Kordofan, southerners responded to the incursion of mechanized farms on their land in the same way as the Nuba — by joining the Sudan People's Liberation Army in large numbers, attacking and burning the large mechanized farms. The people of the Ingessana in southern Blue Nile province had a similar reaction. In northern Upper Nile and Bahr al-Ghazal, mechanized farms were forced to close down after intensive fighting between government troops and the SPLA.

The *shamasa* provided the spark for a 1985 popular uprising which, in informal alliance with the middle-class of public employees, teachers and professionals, impoverished as a result of the IMF's austerity measures and currency devaluations, overthrew Nimeiri's military regime. Parliamentary democracy was reinstated in 1986 and a "National Alliance" of radical political forces concluded a peace agreement with the SPLA/SPLM at Koka Dam in Ethiopia. But it was all short-lived. The new Prime Minister, Sadiq al-Mahdi, started to pursue the war with renewed vigour, arming militias who were loyal to him personally.[17]

Renewed peace negotiations in 1989 were aborted when the National Islamic Front (NIF) staged a coup against the weakened civilian government and intensified the war still further. With the fervour of a *jihad*, they unleashed a reign of terror in the North as well as the South. NIF leadership are male intellectuals from the urban North with strong connections to the business and finance sectors and a strong anti-rural bias. The Islamic banks, nicknamed by peasants the "sorghum banks", have been at the forefront of the new economic regime since the opening of the Faisal Islamic Bank in 1978.

The NIF's military regime escalated the war in the South to new levels of brutality with the backing of radical Islamic and Arab countries. Regarding the South as its strategic resource reserve, it has been single-minded in its resolve to solve the "southern problem" once and for all with a programme of Islamization and Arabization.

Human rights organizations such as Amnesty International and Africa Watch report thousands of extra-judicial executions in the Nuba Mountains and the South. Atrocities against civilians have been committed by the army and the militias. These so-called Murahaleen militias are recruited from the western "Arab" tribes which have traditionally engaged in skirmishes with neighbouring Dinka in the South over grazing lands. Formerly, these encounters did not usually escalate to war, peace being restored fairly quickly through inter-tribal conferences and long-standing protocols for settlement of disputes. The NIF has used such inter-tribal rivalry and some corrupt southern intellectuals to spread conflict among southerners. Thus although the North-South conflict is gradually losing its predominantly ethnic aspect, in the smaller South-South conflict, this aspect is alive and killing.

Conflict Resolution

Although seen by many of the fighters from both sides of the divide as an ethno-religous conflict, the current civil war in the Sudan is an outstanding example of such a conflict gradually but firmly transformed into a resource struggle through persistent ecological degradation in the North, mainly caused by large-scale mechanized farming. The *Jellaba* ruling élites, driven by the international market to specialize in resource extraction, have degraded the resource base to such an extent that its expansion becomes for them a necessity, justifying aggression against their own peoples. To avert future conflicts in the Sudan, it is imperative to halt the mechanized farming of vulnerable lands, as currently practised in the country, to abandon the state monopoly over landownership, and to cancel concessions of large tracts of land to absentee landlords. At the same time, it is necessary to redirect agricultural production to meet local food self-sufficiency needs, to assist peasants and pastoralists to rehabilitate their natural habitat, and to respect in law and in practice the rights of all minorities.

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Codex Alimentarius

Who Is Allowed In? Who Is Left Out?

by

Natalie Avery, Martine Drake and Tim Lang

Under the proposed new GATT regulations, the formerly obscure Codex Alimentarius Commission will have unprecedented influence over the way countries set their food and agriculture standards. Codex meetings are dominated by representatives of rich Northern countries and multinational corporations. Developing countries and public interest groups are under-represented and have less opportunity to participate in Codex procedures.

In 1985, in response to public concern, the European Community banned the import of beef containing residues of growth hormones. US beef producers, heavy users of such chemicals, were outraged by the decision. They contended that the ban had nothing to do with legitimate safety concerns, but was a deceptive strategy to keep US beef from competing in European markets.

A year later, negotiations commenced in Uruguay to amend the General Agreement on Tariffs and Trade (GATT), a treaty which lays the ground rules for world trade. US negotiators, still smarting from the EC ban on hormone-treated beef, put forward proposals to "increase efforts to harmonize national health and safety standards".[1] They also suggested that GATT include a section forbidding signatory countries from setting "unnecessary" safety standards which hinder the trade in food. The EC fell into line, agreeing that there should be measures to "lessen the impact of health regulations on trade".[2]

These proposals led to the inclusion of two agreements — the Sanitary and Phytosanitary Agreements (SPS) and the Technical Barriers to Trade Code (TBT) — in the draft GATT treaty. The SPS covers food safety standards; the TBT covers a wide range of technical regulations or standards including those adopted for reasons of consumer safety, health or environmental protection. Labelling laws and methods of analysis and sampling, for example, would fall under the TBT. The two agreements would require:

- national governments to harmonize food safety and technical measures with international standards as far as possible;
- national food-safety and technical standards to be applied only to the extent necessary to achieve their objectives, and avoiding the creation of "unnecessary" barriers to trade;
- national food-safety measures to be based on scientific principles and not maintained against available scientific evidence.

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A New Role for Codex

The organization selected to draw up these standards is the Codex Alimentarius Commission, a United Nations (UN) food standards body with a membership of over 130 governments, run jointly by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). Codex was set up in 1963 to develop international food safety and quality standards "because of a widely perceived need to facilitate trade in foods".[3] It was hoped that eventually all trading nations would harmonize their food standards with each other. Exporting companies could then move their products more freely around the world, unhindered by what they often perceived as the regulatory excess of some nations.

Currently, standards set by Codex are recommendations only. Governments are not required to accept them, and indeed, many do not. Codex standards are not the very lowest, but neither are they the highest. Many nations set higher standards than Codex, often in response to public interest concerns and campaigns. These include restrictions or bans on food imports that contain residues of carcinogenic pesticides or food additives; such bans are often (like the EC ban on hormones in beef) seen as "unfair" and "unnecessary" barriers to trade.

However, under the new GATT proposals, nations that set or maintain standards higher than those set by Codex could be required to justify them "on scientific grounds" if they affect trade. Citing animal welfare or environmental protection is unlikely to be acceptable. For example, a nation with a pesticide residue limit stricter than one established by Codex could be required to prove to an international GATT panel that its higher standard was necessary for health reasons and based on "scientific principles". This panel, chosen by the GATT secretariat, would meet in secret to examine the case.

If the GATT tribunal decided the nation's pesticide residue limit did constitute a violation of the GATT treaty, those countries which had thereby lost an opportunity to export their products would be authorized to retaliate against many sectors of the "offending" nation's economy. In order to keep its standard, the "offending" nation could elect to pay compensation to the nation whose trade was affected by the standard; or it could apply the stricter pesticide residue limit to home-produced food only and apply lower Codex standards to imports; or it could bow to

international pressure and lower its standard to one that would not adversely affect international trade.

Consequently, although in theory governments may set standards higher than Codex, in practice this could prove difficult and expensive. Already, the attitudes of governments are changing because of the GATT approach. Some nations have started to "harmonize" their food standards to levels established by Codex, even if that means lowering them. Australia's National Health and Medical Research Council (NHMRC), for example, has reviewed the 137 national pesticide residue limits which deviate from Codex standards for comparable pesticides. In 75 of the 81 cases in which a Codex standard was lower than an Australian standard, the NHMRC recommended the adoption of the lower Codex standard.[4]

Baby Milk Action

As far as Nestlé is concerned, women are either mothers or objects. This advertisement for an educational cruise for Brazilian paediatricians exemplifies its unscrupulous promotion in the South of bottle-feeding as a substitute for breast-feeding. Despite such practices, the company helps set international standards for foods and pesticides. Nestlé sent 36 delegates to the last session of Codex, twice as many as any other company, and five more than Brazil.

The EC used Codex labelling guidelines to justify the introduction of weak nutrition labelling legislation in 1990. In the words of one consumers' representative: "Just when we were urging governments to adopt compulsory, comprehensive and comprehensible food labelling, the EC opted for a system which is voluntary, incomplete and utterly mystifying to consumers."[5]

Scientific Parameters

Making nations justify their food safety standards scientifically may seem a fair requirement; scientific research is the accepted mechanism by which society assesses the safety and impact of products. However, there are many gaps in scientific knowledge; for example, tools for assessing the relevance of animal studies to humans are inadequate, and the results of such research are often contentious.

Moreover, the practice of "science" can be subject to the influence of political and social factors. Techniques such as risk-assessment are heavily laden with value-judgements: there are no internationally agreed criteria for assessing the relative importance of risks or benefits relating to the environment, public health, workers' rights and animal welfare.

National food policies are shaped by a diverse set of cultural priorities, traditions and dietary habits. Those who promote GATT harmonization proposals suggest that an international body like Codex can sift through these national differences to determine what constitutes a necessary safety measure and what does not. In the process, high standards for food may be compromised in the pursuit of consensus.

Who Decides?

The internationalization of standard-setting procedures proposed under GATT will undermine democratic control over food policy at the national level. Much of the control citizens and nations once had over national food standards will be handed over to a board of non-elected nominees.

Who are these nominees? Recently, Alan Randell of the Joint FAO/WHO Food Standards Programme told a gathering of consumers that Codex "is the only organisation in the food field that brings together government regulators, consumers and industry representatives in both advisory and official capacities to help develop standards for food manufacturing and trade."[6] This sounds comforting, but Randall glosses over the gross imbalance between industry and government representatives on the one hand and consumer representatives on the other.

Of the 2,019 national delegates who attended the 19th session of the Codex from 1989 to 1991, 445 represented industry, while only eight represented public interest non-government organizations (NGOs). Nearly three-quarters were government representatives, a predominance that can partly be put down to the fact that many of the nations represented have no large and influential industries based within their borders. The countries which are home to the largest food and agrochemical industries accounted for the highest level of industry participation. Industry representatives formed 61 per cent of the Swiss delegations, 49 per cent of the US delegations and 44 per cent of the Japanese.

The figures for Germany are particularly revealing. While the country was divided, West Germany's delegation included 21 per cent industry representatives, whereas East Germany's small delegation had no industry representatives at all. But in

the latter part of the session, after the country was united, the quota of delegates from industry more than doubled to 45 per cent.

These figures are reflected in the levels of industry participation on particular committees. On the Food Additives and Contaminants Committees, industry provided 33 per cent of the delegates and 62 per cent of the observers, while NGOs provided one per cent and six per cent respectively. On the Pesticides Residues Committee, industry supplied 23 per cent of the delegates and 63 per cent of the observers, as against zero per cent and three per cent NGO representation.

In all, 140 representatives from the fifteen most powerful food multinationals and the twenty most powerful agrochemical companies attended. Together, these thirty-five corporations sent more representatives than any single government.

Northern Dominance

The imbalance between industry and NGO participation is echoed by an imbalance between rich and poor countries. Representatives from Europe and North America combined accounted for 60 per cent of Codex participants, despite the fact that these regions account for only 14.6 per cent of the world's population. Forty-seven per cent of all delegates came from just ten countries, all of them in Europe except for the US, Canada, Japan and Thailand. The US alone sent almost twice as many representatives to participate on its national delegations as the entire continent of Africa.

The Codex Alimentarius Commission, as a purely advisory body, has enabled many Third World governments to forego the expensive risk assessment procedures needed to develop food and agriculture standards, and to apply Codex standards where they otherwise might have had none at all. However, Third World countries have experienced technical and financial difficulties meeting the high food standards of industrialized importing countries. Because of this, many promoters of the new GATT suggest that lower standards in the North will improve the trade balances of Southern countries. Such suggestions are music to the ears of multinational corporations who would clearly benefit from a general lowering of standards. If Codex acquires powers to impose sanctions and if it continues to be dominated by industrial interests, there is a grave danger that North/South inequities may be used, not as an argument for providing technical and financial resources to enable Third World countries to meet the First World requirements, but as an argument for the lowering of standards globally.

Reforming Codex

Although Codex and its parent bodies FAO and WHO have made efforts to respond to some public concerns raised over its new role, the reforms they propose are inadequate. They have started to encourage more consumer and Third World government participation on Codex committees,[7] but a lack of money remains a serious barrier to participation for many groups. Moreover, the issue of conflicts of interest raised by the large number of industry delegates, and the loss of democratic control over food standards, have so far hardly been addressed by the Codex internal reform process.

All over the world, consumers and their representatives have fought to improve, maintain and defend better national food standards. Many of these gains may now be under threat. It is vital that citizens and public interest NGOs learn about the Codex Alimentarius Commission, how it operates and who participates on its committees. Citizens must begin to think and act globally to ensure that international standards are set with the consultation and meaningful participation of all interested groups.

This article is based on *Cracking the Codex: An Analysis of Who Sets World Food Standards*, published by the National Food Alliance and endorsed by 47 NGOs worldwide. It is available from: NFA, 3rd floor, 5-11 Worship St., London EC2 2BH, £35 (£7.50 to UK NGOs, £10 to NGOs outside the UK).

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Books

In Praise of the "Seely Spider"

NATURE'S WEB: An Exploration of Ecological Thinking, by Peter Marshall, Simon and Schuster, London, 1992, £9.99 (pb), 513pp. ISBN 0-671-71065-6.

"What is wrong is not really our present industrial practices, but industrialism itself," writes Peter Marshall, " . . . what is wrong is nothing less than the way we see and act in the world". Marshall makes an important contribution to the development of a new ecological worldview by tracing the history of ecological ideas as expressed in the main religious, philosophical and scientific movements of different historical eras.

He begins by determining the ecological content of mainstream religions. Marshall sees Taoism and early Vedic Hinduism as being above all religions of nature, and explores similar tendencies in branches of Hellenic religion, such as the Stoics. Conversely he considers that "many of the ecological ills of modern civilization may be traced to the Judao-Christian tradition", which, being anthropocentric and patriarchal, separates "man [sic] from nature, spirit from matter and soul from body".

Nevertheless, there is a strong ecological undercurrent in the Christian tradition, which he traces with considerable skill, accentuating the works of St. Benedict of Murcia, St. Bernard of Clairvaux, St. Francis of Assisi, who is now the patron saint of ecology, and Meister Eckhart. He quotes Archbishop William Temple, who, at the beginning of this century, tried to formulate a philosophy of religion that did not separate God from the creation:

> "The treatment of the earth by man [sic] the exploiter is not only impudent, it is sacreligious. We are unlikely to correct our hideous mistakes in this realm unless we recover the mystical sense of our one-ness with nature. Many people think this is fantastic. I think it is fundamental to our sanity."

Marshall proceeds to the development of scientific and philosophical thought in the West. The influence in this realm of the 16th century Francis Bacon could not have been more anti-ecological. The virtuous man, Bacon thought, should seek "victory over his nature" and "alter and subdue nature" which was "incomplete and corrupt". He anticipated many of the later scientific developments such as experiments on living animals and genetic engineering. "Bacon's philosophy has ruin'd England," thundered Blake. "One might add," Marshall notes, "that it has ruined the earth itself".

René Descartes's mechanistic attitude to vivisection is also revealing:

> "To nail a dog to a table, like Vesalius and dissect it alive to study the circulation of the blood is therefore not different from dismantling a clock, and it is misguided sentiment to commiserate with the victim. Animals do not belong to our moral community and are not worthy of moral consideration."

But Marshall also detects a "philosophical counter-revolution" to the mechanistic outlook of Descartes from Giordano Bruno and Michel Eyquem de Montaigne who were both suspicious of attempts to improve Nature. "We have so much by our inventions surcharged the beauties and riches of her workes that we have altogether overchoaked her," Montaigne wrote. "All our endevour or wit cannot so much as reach to represent the nest of the least birdlet, its contecture, beautie, profit and use, no, nor the work of the seely spider."

The French 16th-century potter Bernard Palissy extended the critique:

> "If agriculture is carried on without philosophy, it amounts to a daily violation of the earth and the things it produces; and I marvel that the earth and its products do not cry for vengeance on certain murderers, ignorant and ungrateful, who every day do nothing but waste and ruin the trees and plants without any consideration".

Jean-Jacques Rousseau echoed these sentiments some two centuries later: "It was iron and corn which first civilized men, and grew inhumanity". But his criticism had a social edge:

> "The first man, who, having enclosed a piece of ground, bethought himself of saying 'this is mine' and found people simple enough to believe him, was the real founder of civil society. From how many crimes, wars, and murders, from how many horrors and misfortunes might not any one have saved mankind, by pulling up the stakes or filling in the ditch, and crying to his fellows; 'Beware of listening to this impostor. You are undone if you once forget that the fruits of the earth belong to us all, and the earth itself to nobody'."

Rousseau laid the groundwork for the decisive shift in consciousness that occurred in the 19th century, embodied not only in the romantic poets — Marshall singles out Samuel Taylor Coleridge as particularly influential — but also in the Utopian and anarchist traditions from Charles Fourier and Pierre-Joseph Proudhon through to Prince Peter Kropotkin and William Morris.

"Men no longer love the soil," Proudhon wrote. "Landowners sell it, lease it, divide it into shares, prostitute it, bargain with it and treat it as an object of speculation. Farmers torture it, violate it, exhaust it and sacrifice it with their impatient desire for gain. They never become one with it." Like Kropotkin and Gandhi and those who followed him, Proudhon saw the ideal society as a federation of self-governing communities, an ideal on which the author himself elaborates in his final chapter. "Nothing short of a fundamental change in consciousness within society can prevent us from careering towards ecocide." The solution, he suggests, resides in the development of a "decentralized society of self-managing communities" which he sees as resembling "a web, with interwoven strands" rather than a pyramid.

Even those familiar with this literature will find that this clearly written and highly-documented encyclopaedic work highlights some hitherto neglected strands in the web of ecological thought. The book deserves to be a standard work for use in schools and universities.

Edward Goldsmith

Edward Goldsmith is founding editor and publisher of *The Ecologist*.

A Mine of Information

THE GULLIVER FILE, by Roger Moody, Minewatch, London, 1992, £150 to profit-making organizations, £25 to others (hb), 900pp. ISBN 90-6224-999-X.

The British government, which is due to publish a review of the nuclear industry at the end of 1993, would do well to bear in mind the words of Michael Barnes QC, adjudicator at the Public Inquiry for the Hinkley Point nuclear reactor. In a report published in 1989, Barnes recommended that:

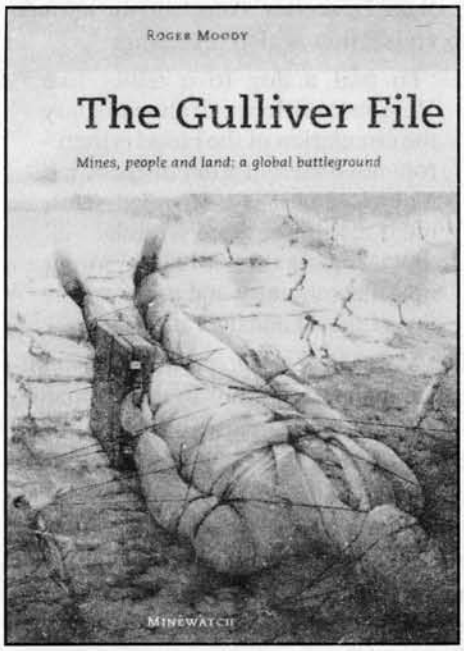
> "If future proposals are put forward for further nuclear facilities which would involve the importing of uranium, the applicants should use their best endeavours to present information to any future inquiry on conditions for workers and the public in the countries concerned which might be affected by the mining and processing of uranium for the projects."

Little information, however, has been available publicly about the uranium used by the UK. The publication of *The Gulliver File* changes that. The book documents in exhaustive detail the often unscrupulous activities of mining companies associated with the exploitation and trade of uranium and other minerals worldwide.

The Gulliver File arose out of opposition in 1978 to the construction of an Advanced Gas Reactor at Torness in Scotland, when activists identified the need for a reference book on uranium mines and the companies involved. The task was taken on by Roger Moody of the campaigning group Partizans, which scrutinizes the activities of Rio Tinto Zinc, and later of Minewatch. Fifteen years later, a treasury of information on not only uranium but all mining activities has emerged, as well-researched and accurate as might be hoped for given its long gestation. It covers the social, environmental, health, economic and legal aspects of mining by concentrating on individual companies.

Until recently, those assessing nuclear energy in Britain have paid more attention to "end of the pipeline" processes than to those involved in obtaining uranium. There is at present no international body regulating the environmental impact of uranium extraction and processing. Although the International Commission on Radiological Protection (ICRP) suggests radiological dose limits, these are only recommendations. The UK has followed up some of these, although there was a delay of seven years in implementing the advice provided by ICRP in 1977.

Other countries supplying the UK with uranium have implemented few of these recommendations. The most recent ICRP document, issued in 1990, suggested an occupational exposure limit of 20 milliSieverts a year, but this has not yet been followed by a corresponding lower dose limit for exposure to radon in mines. Most mining companies have resisted all ICRP recommendations as being too costly to implement; uranium miners face the highest average exposures of anyone involved in the nuclear fuel process and radiation risks which would not be allowed in any part of the process undertaken within the UK.



In 1974, Rio Tinto Zinc's Rössing mine in Namibia was declared in breach of international law by the International Court of Justice. Despite widespread protests and legal action from the United Nations and the Namibian SWAPO government, this declaration was ignored by RTZ and the UK government, which continued to build up stocks of uranium, reportedly for the Trident nuclear submarine programme.

Uranium ore, once mined, has to be pulverized and chemically treated to extract the very small amount of usable uranium, leaving behind large piles of waste (tailings). About 86 per cent of the radioactivity of the mined ore remains in the tailings. For every tonne of uranium imported by the UK, 2,000 tonnes of tailings are created elsewhere. The UK civil programme has used some 43,000 tonnes of uranium so far, implying almost 90 million tonnes of waste elsewhere.

Beyond questions of radioactivity and environmental damage, uranium mines take up land which, as often as not, has been wrested from a local community. In this respect, uranium mines are no different from mines extracting aluminium, gold, iron or other minerals. "The primary role in deciding where, what and how to mine, must lie with those on whose land the minerals are to be found," says Moody.

The Gulliver File lists some 4,000 companies and subsidiaries operating in over 120 countries. It is a *tour de force* of research and an invaluable tool for any community trying to fight off the attentions of an uninvited corporate giant.

Jill Sutcliffe

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Poachers in "Eden"

THE MYTH OF WILD AFRICA: Conservation Without Illusion, by Jonathan S. Adams and Thomas O. McShane, W.W. Norton, New York and London, 1992, 266pp. £15.95, ISBN 0-393-03396-1.

The very word "Africa" conjures up for Westerners a multitude of myths and images. One such image is of "Africa as a glorious Eden for wildlife . . . a virgin land, unsullied by human hands". The extent to which conservation in Africa today is still informed by this image is the subject of this illuminating yet disturbing book: illuminating because it is an authoritative document, produced by two sympathetic Americans who have worked and travelled extensively in Africa; disturbing in that it shows, sometimes starkly, that the attitudes of Western conservationists to their "Eden", and to Africa and Africans, have changed little since Livingstone's *Missionary Travels*, written in the middle of the 19th century.

Adams and McShane dispel the Eden image at the outset:

> "This Africa never was . . . Man [sic] has been part of the African landscape for over two million years. That people lived in Africa, however, was irrelevant to the West: what mattered was the wilderness. Wild Africa was considered so important, in fact, that people in Europe and North America organised a movement to save it."

Whom did they want to save it from, how, and for whom? From Africans, by fencing it off for Europeans and Americans. Yet:

> "a fenced park in Africa is a symbol of failure, of an inability to reconcile the needs of man [sic] and animals . . . these fences can also be seen as the logical extension of conservation as it has long been practised in Africa, with its lack of understanding of the need for a living, fully integrated ecosystem that includes human beings."

Besides failure, however, implicit in the fenced-off park mentality is the depiction of Africans as villians. When asked who is responsible for the decline of the African elephant or black rhino, many people in the West will answer : "poachers" — not the ivory traders of the Far East, nor the horn traders of the Middle East, nor their willing customers in Europe, the USA and Japan. Media and conservation societies employ the powerful and insidious imagery of (black) African poachers felling and dismembering these beasts whilst being chased and shot by (predominantly white) National Park Rangers, images which may be the "most lasting residue of the elephant campaign".

Adams and McShane argue that the current park-and-armed-ranger approach to conservation in Africa is preservationist, dating from the colonial era. During the 1960s and 1970s, this standard was given great impetus by "one of the towering figures of African conservation: Professor Bernhard Grzimek", who displayed a stunning naïvety about the responsibility of the Maasai for the creation and maintenance of savannah ecosystems. To him, they "had no business" there. Dian Fossey, of *Gorillas in the Mist* fame, was more direct in her racism against local people: "she called them 'wogs', or, oddly, 'apes'".

Within the Serengeti plains and other parks, "African hunters have been branded 'poachers', a word laden with value judgements about the supposed heroes and villains of conservation," not unexpected when "the entire modern conservation edifice rests on the ideals and visions of people other than Africans".

The superimposition of values, attitudes and environmental management systems which were developed elsewhere onto a totally different political, cultural, social, economic and ecological system creates enormous problems which the authors analyse well. Even when Africans are in control, however, having been trained at the Smithsonian Institution, the University of Massachusetts or Colorado State University, "they simply carry out the plans of the generally white, European and American specialists". Thus, oddly, these Africans "inherit and pass on a conservation ethic created in large part by the great white hunters."

The root of the problem, argue Adams and McShane, is the American universities' and their African counterparts' concentration on science — botany, zoology and ecology — when "what is badly needed, instead, is a greater emphasis on teaching wildlife managers to deal with people" because "the problems facing most managers of National Parks and reserves are today much more sociological than biological".

The authors leave the biggest myths until last. In a chapter entitled "Who says Africans don't care?", they note that African governments, whilst having to cope with poverty, famine, medical and educational needs, spend collectively $115 million on conservation each year, far outstripping the support given by international conservation organizations: the World Wildlife Fund for Nature, the largest conservation organization, gives Africa a total of $15 million per year. The authors are effusive about the local potential for conservation: "Rural communities in Africa are fully capable of taking active, well-planned steps to protect their environment, despite popular misinformation to the contrary" but they "will support conservation only when they become active participants in the process".

Having comprehensively dispelled the Western myths of Wild Africa, built up since last century, the authors' endnote is key: "Africans do care about wildlife. They live with it every day. They have been labelled as the problem; they are in fact the solution."

Julian Agyeman

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The Grow Canola Generation

THE RAPE OF CANOLA, by Brewster Kneen, N.C. Press, Toronto, 1992, $17.95 (pb), 230 pp. ISBN 1-55021-066-1.

Brewster Kneen's thought-provoking story of how the breeding and processing of oilseed rape has been taken over by transnational corporations raises pertinent questions about the control of science and technology, the nature of ownership and the control of information.

Rape is the world's third largest oilseed crop, after soya and cotton-seed. Research into rapeseed in Canada, the world's third largest producer, began in the 1940s with the aim of diversifying prairie agriculture away from cereals. It was directed into developing diverse strains for different agricultural situations and into improving rapeseed's oil-processing qualities; it was mainly carried out in the public sector; and it was regarded as "inquisitive", "speculative", even "existential" in nature. Researchers now look back on this "utopian" period when information moved freely between different research institutions.

In 1974, altered varieties of rapeseed, the double-lows or canolas, were introduced into Canada. These new varieties were low in erucic acid (an impurity of the oil) and low in glucosinolates (impurities in the meal). Most importantly, canola meal could be fed to cattle, which made the crop considerably more competitive. From then on, the nature of rapeseed research, as well as the development of the crop, altered. Researchers, now increasingly funded by corporations, bred to a different and narrower selection of criteria — uniformity, predictability and yield were the desired qualities. Answerable only to the demands of an intensified agriculture based on the displacement of smaller farmers and the use of agro-chemicals, research became divorced from its previous social and environmental context. In short, when rapeseed became canola, it became more of a commodity.

Kneen goes on to suggest that genetic engineering of canola has a class dimension. High Response Varieties are élite seed, regarded as ontologically

superior to non-canola varieties — a concept that would have seemed absurd to previous generations of farmers, for whom genetic diversity reflected the diversity of different growing conditions. Just as upper class society consumes more than its share of resources and human labour, so with hybrid seed. Hybrids require a complete support system, including fertilizer, adequate water and crop protection agents. They also successfully monopolize research funding, starving low-input, sustainable food production of resources.

By the 1980s, corporations were selling farmers a complete package for growing a crop: hybrid seed, fertilizers and pesticides. In the 1990s they are taking the degree of control one step further and encouraging farmers to sign growing contracts. In hiring out their land and labour to the companies, farmers become, in effect, company employees.

In order to accumulate private wealth, so the theory goes, it is necessary to commoditize a product, to make it scarce to increase its value, and to make the consumer return to buy more. Biotechnology, as a means of commoditizing information, fits neatly into this pattern. "To discover a gene is to be able to claim and patent it", yet nothing is created, nothing invented. The product is made scarce by patenting and by hybridization which makes the seed sterile. Finally, because all canola varieties have a narrow genetic base, pests and diseases are able quickly to develop a resistance. This necessitates more breeding and greater farmer dependence on the owners of the seed-stock. It is the agricultural equivalent of built-in obsolescence in cars.

Kneen uses the canola story to demonstrate how the present food system is now a vehicle for capital accumulation and control, while "feeding the world" has become an incidental by-product. He shows how corporations have acquired control over farmers, consumers and governments, who increasingly play the role of "tax-collectors for corporate treasuries"; and how they have been allowed to move into such powerful positions, in the name of science, the free market and progress.

Paul Fairclough

Paul Fairclough is an organic farmer in Wiltshire, UK.

BOOKS DIGEST

- DIVIDING THE WATERS: *Governing Groundwater in Southern California*, by William Blomquist, International Centre for Self-Governance, 243 Kearny St., San Francisco, USA, 1992, $44.95 (hb) $14.95 (pb), 413pp. ISBN 1-55815-200-8 (hb) 1-55815-210-5 (pb).

The management of Southern California's sparse water supplies is often depicted as "piecemeal", "inefficient" or even non-existent. This detailed study argues that, in fact, local water users have developed remarkably successful self-governing arrangements for the collective control and individual use of their groundwater basins — a Western parallel to the well-documented local irrigation regimes operating in many Third World countries.

- MAKING THE COMMONS WORK: *Theory, Practice and Policy*, edited by Daniel W. Bromley, International Center for Self-Governance, San Francisco 1992, $44.95 (hb) $14.95 (pb), 339pp. ISBN 1-55815-198-2 (hb) 1-55815-217-2 (pb).

With the help of case studies drawn from Asia, Latin America and Mediterranean countries, academics analyse the performance of commons regimes in terms of their efficiency, equity and resilience. They conclude that commons systems can provide social and ecological balance in fragile or threatened environments. Yet the authors do not underestimate the difficulty of preventing "free-riders" from undermining individuals' incentives to contribute to a common effort.

- ENERGY EFFICIENCY POLICIES, by Victor Anderson, Routledge, London, 1993, £30 (hb) £7.99 (pb), 91pp. ISBN 0-415-08697-3.

A useful survey of the likely effects upon energy efficiency of applying carbon taxes. Anderson details 20 reasons for present-day energy inefficiency and makes 15 proposals for change, including a progressive carbon tax which would increase with an individual's energy consumption.

- RACE AND THE INCIDENCE OF ENVIRONMENTAL HAZARDS: *A Time for Discourse*, edited by Bunyan Bryant and Paul Mohai, Westview Press, Boulder CO and Oxford, 1992, £24.50/$36.50 (sc), 251pp. ISBN 0-8133-8513-X.

The disproportionate amount of pollution borne by non-white communities is, in the authors' view, evidence of environmental racism. The book gives background to the emergence within the ailing US civil rights movement of groups campaigning for a clean and safe environment.

- THE GAIA ATLAS OF CITIES: *New Directions for Sustainable Urban Living*, by Herbert Girardet, Gaia Books, Gloucestershire, 1993, £9.99 (pb), 191pp. ISBN 1-85675-065-5.

"Inner cities are problem cities" — but they don't have to be. Drawing on over 80 case studies, this book puts forward ideas and strategies to recreate cities, home for nearly two-thirds of the world's people, as healthy and humane places.

- RISK SOCIETY: *Towards a New Modernity* by Ulrich Beck, Sage Publications, London and New Delhi, 1992, £12.95 (pb), 260pp. ISBN 0-8039-8346-8.

The threats to plant, animal and human life, produced and distributed on a global scale by industrialization, are giving rise to a society founded upon the taking of calculated risks. Beck examines the political economy of knowledge, the changing roles of class and gender in the work environment, and the personal and public politics of this new risk society.

- ENVIRONMENTAL PHILOSOPHY: *From Animal Rights to Radical Ecology*, edited by Michael E. Zimmerman, Prentice-Hall, New Jersey, 1993, £27.80 (pb), 437pp. ISBN 0-13-666959-X

A collection of discussions from leading philosophers in five areas of current environmental thought: environmental ethics, deep ecology, ecofeminism, social ecology and animal liberation and rights.

Letters

A Tarmaced World

I must write on behalf of the Dongas Tribe to thank Simon Fairlie for his excellent article "Tunnel Vision, The Lessons from Twyford Down" (*The Ecologist*, January/February 1993). It raised points that have great relevance to anyone with an environmental conscience in Britain.

First, although Twyford Down is the most important, significant road-trashing to occur in Britain, it is also the spearhead of a huge plan of destruction that will rip and tear through the country. The Department of Transport's nightmarish and insane roads programme will destroy 800 Scheduled Ancient Monuments, 160 Sites of Special Scientific Interest, 12 Areas of Outstanding Natural Beauty, two National Parks and 30 National Trust properties, not to mention thousands of people's homes. This relentless drive to spread tarmac all over our countryside, destroying our beautiful and historic environment, occurs at a time when reports are issued daily about the effect that cars have in terms of pollution, resources and the petro-oil industry, and when cries are becoming louder and louder against the disappearance of our public transport system.

Second, the point about large environmental organizations dropping out far too soon, or not even getting involved at all, is only too true. Friends of the Earth, when things looked a little tough, ran away and admitted defeat. English Heritage once said that the whole of Twyford Down should be made a Scheduled Ancient Monument, so where were they? It is useless and, perhaps more important, damaging to start denouncing each other now, but I wish you had all been there in December when the yellow uniformed men surrounded those beautiful Dongas and trees and bulldozed the whole lot. There were just 15 of us and 130 violent men but we really slowed them down. It could easily have been stopped, if we had all been there.

We need to have less so-called pragmatism and more strength, more courage when faced with barefaced evil and more of a willingness to accept gut feelings of right and wrong, act upon them and unite with "unfamiliar" people, and not to adopt the "hypocrisy of pragmatism".

Twyford Down is still there; saving this precious landscape could have huge implications for every future road desecration scheme. All local anti-bypass/motorway/road groups (the NIMBYs) need to link up, and all major environmental groups (Friends of the Earth, Greenpeace, Council for the Protection of Rural England, WWF) need to use their campaigning muscle so that a huge, mutually-supporting campaign against the appalling road schemes can be built up. When the young idealists come along (The Dongas, Tribes of the World, Earth First!), we must unite and support each other, and must not be afraid of the label "radical". What the Department of Transport is doing and planning in Britain is radical and outrageous. The British landscape is about to be drastically altered; our world is about to be tarmaced.

Representatives from the Twyford Down Association, The Friends of Twyford Down and the Dongas Tribe have publicly spoken of the lack of communication within their campaign, the lack of support from outside groups, their experiences of how ruthless and determined the DoT can be (the violent security thugs, the private detectives, the corruption) and about how much can be learned from it.

Twyford Down is still there, scarred now but not destroyed, still precious, still hugely important, still worth fighting for. It is the symbol of a huge environmental struggle to come: the DoT against the countryside of Britain; the car versus the planet.

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Wider than Twyford

Simon Fairlie's article, "Tunnel Vision" was right to acknowledge the courage and commitment of the self-styled Dongas Tribe, but it was grossly unfair to others, both individuals and organizations, who over many years, when a different outcome stood a real chance of being achieved, made every bit as great a commitment to Twyford Down.

It should not be forgotten that Friends of the Earth is the *only* organization involved in the Twyford Down campaign to have an injunction hanging over it. To ignore that injunction could result in a hefty fine that would seriously impair our ability to campaign. We did not "give up", we were cut from our chain slung across the entrance to the site works by the police with bolt-cutters!

To write, with the wisdom of hindsight, that Twyford Down symbolizes the "shame" of the whole of the environment movement, may make good copy; it does not make good sense. Twyford Down is and will remain a potent symbol — not of the bankruptcy of the environment movement, but to inspire, empower and inform other communities and campaigns around the country.

Too often, the media has a fixation with the "moment of conflict", when the bulldozers are going in, when the turf is being stripped, and the damage is done. Simon Fairlie has the grace to admit that *The Ecologist* was itself found wanting at the time when press coverage was most needed to raise and positively direct public support — the time when the General Election still loomed, before the European Commission dropped its legal case against the UK, and when the contract for the main cutting had yet to be let.

Of course, we feel anger and anguish at the spectacle of the Department of Transport's vandalism, are outraged at the emptiness of the Government's Rio-rhetoric, and must critically but constructively review our efforts on Twyford. But talking all our efforts down only serves those who wish to build roads through a further 160 Sites of Special Scientific Interest (SSSI).

It is true that, although the section of Twyford Down on the route of the motorway has been stripped of its topsoil and major works are well under way, it has not yet been totally destroyed. Nevertheless, Friends of the Earth has made the decision that the opportunities to make a difference on *this* road scheme have passed, and that our efforts are better deployed elsewhere. Such decisions are never easy and are unlikely to be popular, but our job is to use our limited resources most effectively for the benefit of the environment as a whole.

Sadly Twyford Down, for all its significance, is not the only important wildlife and landscape site being sacrificed by this Government. Across the Severn Estuary, the as yet untouched SSSI and internationally important wildfowl site of Cardiff

Bay is to be drowned, despite the best efforts of other environmental groups, in particular the Royal Society for the Protection of Birds. Ignoring the "bigger picture" lays *The Ecologist* open, uncharacteristically, to accusations of "tunnel vision".

Instead, we believe *The Ecologist* should look ahead to sites such as Oxleas Wood, threatened by the East London River Crossing, and the last of the Department of Transport's road schemes still facing possible legal action from the European Commission. Friends of the Earth nationally and locally has been working on Oxleas since 1985; we are now entering a crucial preconstruction phase of perhaps a year before the bulldozers head for Oxleas. Yes, there are lessons to be learnt from Twyford, and, with an alliance formed of perhaps the broadest range of environmental groups yet to work collaboratively on any campaign, we aim to ensure Oxleas benefits from those lessons.

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Who Let Twyford Down?

Your editorial "The Lessons from Twyford Down" focuses on recent events in the eight-year campaign to save Twyford Down from destruction. Whilst these are obviously freshest in the memory, and colourful to boot, I am deeply concerned that they are obscuring the really important lessons that have to be learnt by all who aspire to preserve our fast diminishing countryside and natural heritage.

What is truly reprehensible is not the absence or inactivity of *The Ecologist*, Friends of the Earth, the Twyford Down Association and others last December, after the crucifixion had taken place, but the absence of those organizations, commonly understood to be custodians of our natural heritage, at the moment when the Down could have been saved — the cock crowed thrice some eight years ago. Some of these organizations even supported the Department of Transport's cutting route.

Conservationists in Britain are in danger of falling into the adverserial mode — the time to alter decisions is before they are made. Self-indulgent exhibitionism does not normally win friends and influence people; it may indeed do a disservice to the cause.

The single lesson that Twyford Down can bequeath is the urgent need to set up a system of "early warning". Information is readily available from the Department of Transport and the local authorities, but apparently is not collated and disseminated in a disciplined and organized manner. With modern technology, there really is no excuse for this.

The longer-term strategy must include a statutory responsibility on any organization in receipt of public funds or charitable donations to submit professional assessments of plans and schemes at the earliest stage in the decision-making process.

By definition, tragedies are avoidable. Twyford Down is undoubtedly a tragedy. Let us all work to ensure that in its demise, the landscape of Winchester, England's ancient capital, becomes more influential than it ever was as undisturbed English downland.

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Two's the Limit

Your reply to Bill McCormick's criticism (*The Ecologist*, January/Feburary 1993, Letters) is very, very unsatisfactory and contradictory.

You, who are so committed to save the Earth and mankind and the other species, you who have such strong opinions on so many questions, do not answer a straight question in a straightforward manner. McCormick has asked: "Do you agree . . . that overpopulation is a myth?" And you have avoided the question by replying that you do not "take up the question of whether 'overpopulation' or underpopulation' is a myth". How can you still produce a journal carrying the title *The Ecologist* without taking up the question? It seems to me that you are afraid of taking up the question. Of whom are you afraid?

You write that you want to point out "how effective they (the controls) are depends on who decides on the numbers of children to be born and raised". This question is totally irrelevant. Neither the father nor the mother, neither the state nor the religions can decide on the numbers any more. It has already been "decided" by the science and state of the ecology of the Earth and by some other sciences dealing with the Earth's optimum carrying capacity. And they have "decided": not more than two children per couple, preferably (on average) less than that.

In the early 1970s, *The Ecologist* wrote unambiguously that, in its opinion, England was clearly overpopulated. And the optimum world population seemed to it to be the then 3.5 billion, probably less than that (See *A Blueprint for Survival*). But in 1993 (when the world population is 5.5 billion) you write that "it does not follow from" what has been written in *Whose Common Future?* (*The Ecologist*, July/August 1992) "that it claims that numbers can go on rising indefinitely". Why this roundabout and ambiguous statement? Do you mean to say that the numbers could go on rising without harm for one more decade or two?

You write: "Women in India, as elsewhere, have always sought to limit births." That is true, but (believe me, I am a 56-year-old Indian, and I know what I am talking about) they sought to do it only after the fifth or sixth or seventh child. Nowadays, many are doing that after the second child, but they are a minority. If you leave the decision on the number to Indian women, most of them will stop only after they have borne two sons and that

may mean five or six children in all. Men may also decide similarly. I have heard from a woman sociologist from Zimbabwe that a woman there attains a good status in her society only after she has borne about six children.

In general, you have mixed up two questions that should be separated: the *need* for population control and the pros and cons of *particular* means, methods and programmes thereof.

Finally, if some political interests are misusing the fact of overpopulation, that does not mean that overpopulation is not a fact!

If you can water down one consequent position in this way, then I am afraid you may water down the other ones too, such as your critique of industrialism.

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An Overpopulated World

Your reply to Bill McCormick's letter was misconceived. You were asked a straight question — whether you considered the world overpopulated — and you failed to give a straight answer. It was depressing enough that last summer's Rio Summit evaded the issue, but it is worse to see the same thing happening in a magazine that still calls itself *The Ecologist.*

Slogans about reproductive rights bring you some strange bedfellows — the Catholic Church and individual campaigners like mother of nine (or is it ten?) Victoria Gillick; the scientists working non-stop to extend the capacity to bear children past the menopause as well as to produce more babies by artificial insemination and fertility drugs; the many governments who induce women to produce large families, sometimes through large cash bonuses for each extra child.

Your one-dimensional focus on what you call the "Commons" is becoming increasingly tragic. In particular, it blinds you to what is rightly called the "tyranny of small decisions" of which there is no better illustration than the parenting of more children. Most readers will know couples who have exercised their "right" to parent three or more offspring, even though they are neither poor, uneducated nor lacking in the means of contraception. They simply made a choice which, in effect, says that the world can not only cope fine with its existing numbers, but also with further increases. However, as any magazine in touch with ecological reality would recognise, the Earth's life-support systems are already wilting under the existing load of people.

Overpopulation is, of course, not the only source of excessive pressure upon ecosystems. Authors and campaigners on this issue like Paul and Anne Ehrlich have long drawn attention to the malign effects of the overconsumption of particular social groups and of wasteful technologies. Each multiplies the bad effects of the other two factors. Yet there are good grounds for treating population as the most decisive parameter. In a careful study on the sources of environmental degradation in the USA, land of fast multiplying motor cars, John Holdren demonstrated that the major factor was the simple fact that there were more Americans.

It is facile to denounce "technocratic" solutions and state interference in reproductive activity. It is a perfectly appropriate use of scientific know-how to develop, for example, safer forms of birth control.

Furthermore, the provision of education and free contraceptives requires government action. So too does action to redress gender inequalities and redistribute wealth. By all means, let us decentralize state structures and make them as democratic as possible, but to deny the role of government is to throw out the baby with the bath water.

To conclude that the world is indeed overpopulated is not to indulge in mere slogans. It is a declaration of intent to change our culture and public policies from their present pro-natalist bias to one which tries to keep our numbers in harmony with ecological sustainability and with the claims of non-human life forms to their share of the earth's finite space and resources.

Writers from whom *The Ecologist* once took inspiration, such as Eugene Odum, have published studies on ways to calculate local carrying capacity. Perhaps it is time to go back to your ecological roots and cut out the politically correct but empty rhetoric.

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Free Trade in India

I have been reading your recent articles on free trade and agriculture at a time when millions of Indian farmers are engaged in a struggle against the import of some three million tons of North American and Australian wheat.

But the condemnation only of "free trade" misses some important points. In India, it is the Government of its own volition which is purchasing grain at Rs 500 to Rs 550 a quintal while refusing to pay local farmers more than Rs 280. This has been going on for some years: the Government, trying to ensure a cheap and reliable source of grain for its ration system, has not only turned the northwest of India, mainly Punjab, into a "breadbasket" in Green Revolution-fostered uneven development; it has also used a variety of methods to hold prices down. These have included the years of dumping PL 480 wheat and periods of compulsory levy; more recently, the Government uses a zoning system which forbids farmers not only to export outside the country but even to sell outside the zone. Since Punjab produces for Delhi and Bombay, not for its own population, this means that no merchants inside of Punjab will buy grain unless they can ship it. In recent months the trains have refused to carry grain outside the state, while farmers who have tried to haul their own wheat to market outside the zone have been arrested and their stocks confiscated.

These actions of the Government to ensure a monopoly purchase of foodgrains have been only a few of the forms of state intervention in Indian agriculture. The state also forbids farmers from doing their own processing. For example, in Maharashtra where I live, farmers are not permitted to follow traditional methods of separating cotton lint from seeds under the Cotton Monopoly Purchasing Scheme; in sugarcane areas a special permit is now required to make jaggery (unrefined sugar lump) by traditional methods rather than to give the cane to the sugar factories. Peasants trying to build a small dam by selling some of the sand from a dried-up river running through their village had to engage in a four-year struggle with the state Government to get the rights to prevent the sand being auctioned off to contractors. Finally, the Government budget for promoting agriculture is centred on the biggest subsidies of all — chemical fertilizers and huge irrigation projects.

All these forms of state control and

subsidies have been the result of a general development policy which has tried to finance heavy industrial development by providing cheap food, cheap raw materials, cheap energy and cheap labour. Unfortunately this policy, including the cheap food, has been consistently defended by Indian left intellectuals, who have depicted farmer demands for higher prices as those of *kulaks* (rich peasants in Russia) and protests against big dam projects as being "against making India strong." Even today, people are arguing for the Indian Patent Act on the ground that it has made pesticides possible (the first on the list are DDT and BHC), and complaining that GATT will not allow the Government to purchase grain at below market prices.

One result is that a large section of the independent farmers' movement in India is saying that their enemy is the Government, and that they want more of the free market, not less. Again, many of the left intellectuals say that this is the response of *kulaks*. But these same farmers' organizations are the ones who have said, "we don't want fertilizer subsidies, they subsidize the fertilizer companies, not the farmers" — at a time when **all** political forces are calling for maintaining fertilizer subsides. Looking at the available data on international food prices (and I may be wrong), it does seem to be true that if market prices prevailed everywhere, it would be farmers (or perhaps agribusiness) in Europe and North America who would lose, not Indian and other Third World farmers.

This seems to be the point of Mark Ritchie's article (*The Ecologist*, September/October 1992) which argues contradictorily that if Mexican farmers maintain cattleherds and grow corn, their forests will be destroyed, but that American farmers will be driven out of business if they do not get high enough prices to do exactly that. He mentions northern Minnesota, where my family comes from; it would seem that allowing most of it to go back to forest would be the best solution. On this kind of issue, don't we finally have to come to the admission that a level of consumption which requires so many cattleherds and such massive grainfields to maintain them is simply unsustainable and unjustifiable?

Obviously we cannot welcome every form of "free trade" and reject every form of "state" intervention. But it is somewhat disturbing to see a Green movement journal like *The Ecologist* shy away from dealing with the state. If Mark Ritchie and others pose the issue as "sustainable agriculture versus free trade", the obvious implication is that the alternative is state control. Whatever happened to the insight that statist industrialism is as unsustainable as free market capitalist industrialism? In fact, from Columbus on, it has been not simply the "market" but conquest, state violence, loot, colonially controlled captive markets and enforced monopolies over raw material supply that have plundered the world's peasantry and nature. The independent governments of Third World countries have continued policies of extraction. Even today much of the outcry in countries like India against the "free market" is coming from the exploiting, bureaucratically-based upper caste sections who used the state in the past to have assured incomes, cheap food and sources of control They want that kind of state back. Indian farmers do have some ground in suspecting that those protesting against the market have no intention of using their state power to promote a sustainable form of development; none of the existing parties, including the left, have shown any indication of being sensitive to ecological issues. Until a more trustworthy "political class" can be built up, it makes sense in India to demand a little more of the market, and a good deal less of the state which has been exploiting them so effectively. More important, a genuine ecological alternative, building on respect for the earth and the communities of producers who are able to live on it in harmony, has to make it clear that it will go beyond both market and state.

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My Enemy's Enemies

Your editorial "My Enemy's Enemies" (*The Ecologist*, March/April 1993) is the best, most concise treatment I have seen of a problem which is becoming a major obstacle in building an environmental movement rooted in grassroots action and reality, one which holds institutions accountable for their activity, no matter what their missions or righteous cause. Thanks for doing it.

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Correction

Regarding the article "Local Initiatives in Southern Mexico" (*The Ecologist* November/December 1992), I consider it necessary to make the following remarks.

The article states that "this land is barely productive, even with applications of fertilizers and pesticides, still regarded by many as *magic chemicals*." In my original article, the same passage reads: "This land is no longer able to produce even with *magic chemistry*". The expression "magic chemistry" was *my* way of referring to chemical fertilizers. It was by no means my intention to imply that the people of the region still believed fertilizers were some kind of magic chemistry.

Marta Guidi
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Classified

DIARY DATES

May 17-21, 1993: Second International Conference on **HOLISTIC HEALTH AND MEDICINE** at Church House Conference Centre, Westminster, London. Contact IHHA, Forge House, Mill Road, Liss, Hampshire, GU33 7DX. Tel: 0730 894111, Fax: 0730 95293.

May 18, 1993: One day symposium on **LEAKAGE CONTROL IN THE WATER INDUSTRY** at Cavendish Conference Centre, London. Details from The Institution of Water and Environmental Management, 15 John Street, London WC1N 2EB. Tel: 071- 831 3110, Fax: 071- 405 4967.

May 25, 1993: A one-day conference on **PETROLEUM-BASED LAND CONTAMINATION** at The Institute of Petroleum, 61 New Cavendish Street, London W1. Conference Officer Ms Caroline Little, Tel: 071-636 1004, Fax: 071-255 1472.

June 9-11, 1993: The Centre for Environmental Law, University of Amsterdam, will hold an international conference on **ENVIRONMENTAL LAW AND ECONOMIC DEVELOPMENT**. The three main themes are international law, private law in different countries and the enforcement of environmental legislation in countries with different legal and political structures. The conference is aimed at scientists, students, consultants for companies and public authorities, solicitors and those associated with environmental organisations. For more information please contact: Conference Office, University of Amsterdam, PO Box 19268, 1000 GG Amsterdam, The Netherlands. Tel: +31 (020) 525 2690, Fax: +31 (020) 525 2771.

June 23-24, 1993: Third International symposium and exhibition for the pipeline industries, **PIPELINE MANAGEMENT '93** at CBI Conference Centre, London and sponsored by Pipeline Industries Guild, Institution of Water and Environmental Management, International Society for Trenchless Technology, The Institution of Gas Engineers and The Institute of Petroleum. Inquiries to: IWEM, 15 John Street, London WC1N 2EB. Tel: 071- 831 3110, Fax: 071-405 4967.

July 12-13, 1993: **INTERNATIONAL CONFERENCE ON SODIUM IN AGRICULTURAL PRODUCTION**. The 6th annual international conference to be held at University of Wales, Bangor. More information from: Dr C.J.C. Phillips, Tel: 0248 351151, Fax: 0248 354997.

COURSES

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Invitations and calls for papers for two major environmental conferences taking place in September 1993: The annual **European Environment Conference,** September 20-21, 1993 at the University of Bristol and the 2nd annual **Business Strategy and the Environment Conference,** September 23-24, 1993 at the University of Bradford. High quality papers are sought for each conference. Full details are available from: The Conference Organizer, European Research Press, Tayson House, 24-28 Chapel Street, Little Germany, Bradford BD1 5DN, Tel: 0274 729315, Fax: 0274 306981.

SITUATIONS VACANT

Tropical Forest Conservation Charity requires an **INTERNATIONAL COORDINATOR** from June/July 1993 for two years. Pay at local rates, return fares and insurance provided. Applications by end of May 1993. Fundación Ecológica Mazán, a non-governmental organisation based in Cuenca in Ecuador involved in cloud forest conservation, environmental education and rural development projects, is seeking an International Coordinator. S/he will be responsible for day-to-day management of the organization including financial management, the coordination of foreign volunteers and liaison with overseas funding bodies and will be part of a team of 12. Confidence in project administration, fluent Spanish, experience or work overseas, preferably in Latin America, a good understanding of development/conservation issues and knowledge of computerized office management systems are the skills needed. For more details, please contact Rio Mazan Project, 38-40 Exchange Street, Norwich, Norfolk, NR2 1AX. Tel: 0603 611953, Fax: 0603 666879.

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