

The Ecologist

Vol 23 No 1 January/February 1993

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• The Lessons
of Twyford
Down

• Indian
Fishworkers
Defend their
Commons

• Taxing
Nitrogen
Fertilizers

• Fencing
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Cover photo: Angela Dooley of Common Ground, outside the Pine Bluffs, Arkansas, military arsenal. (Photo: John Lindsey/Pine Bluffs Commercial).

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Tunnel Vision

The Lessons from Twyford Down

The Dongas, one of Britain's oldest road systems, are a network of 10-foot-deep trackways that over past millennia have been etched into the hillside of Twyford Down, a hill overlooking the city of Winchester. The Dongas are also one of Britain's most recent tribes, a collection of young "marginals" and "drop-outs", who barely nine months ago started to congregate upon the land from which they take their name, to defend it from being incorporated into Britain's modern motorway system.

In the first week of December, yellow-jacketed security men, attended by executives from Tarmac road contractors, representatives of the Department of Transport (DOT) and members of the police, evicted the Dongas tribe, beating them up and violently groping the women, while bulldozers followed behind to rip up the Dongas trackways. The site is now surrounded by a three-tier fence of coiled razor-wire; in a matter of months it will be a cutting 100-foot-deep and 400-foot-wide, the final three-mile link in the M3 motorway that connects London to the port of Southampton.

The use of crude force by the agents of development in Britain against an unpopular minority is in itself nothing startling — the battle against striking miners in 1984, or the ritual summer persecution of travellers come to mind. But the resistance put up by the Dongas and other groups such as Earth First! is distinguished by one unusual feature: for a moment it captured the support and the imagination of a number of people, many of whom are customarily presumed to lie at the opposite end of the social spectrum.

Accepting Reality

Twyford Down is nominally one of the most well-protected stretches of land in Britain. Positioned in the heart of an Area of Outstanding Natural Beauty, the downland includes two Sites of Special Scientific Interest, while both the Dongas tracks and a threatened bronze age site are Scheduled Ancient Monuments. If Twyford Down were bulldozed, then no site in Britain could be deemed to be safe. Through the 1980s public opinion gradually mobilized to defend the area, and when its destruction became imminent in 1990 this movement emerged as the Twyford Down Association (TDA), headed by a former Conservative Party councillor, David Croker, and supported by many of the citizens of Winchester, reputedly the wealthiest town in Britain. In the single opinion poll taken, only five per cent of the town's population opted for the Twyford Down cutting, the majority preferring an extension of the existing bypass, with slightly less opting for a tunnel underneath the down.

As proposals and counter-proposals were dragged through one enquiry after another, the movement mustered support from other sources. A local traffic consultant, who had several times given evidence for the Department of Transport, testified on behalf of the TDA that the scheme was totally misconceived.



Alex MacNaughton

Media figures such as David Bellamy and Jonathon Porritt lent the campaign their support, as did Friends of the Earth. An almost euphoric spirit of militancy developed. Alan Weeks, the Secretary of Winchester City Residents Association, and a regular attendee of the local Police Liaison Committee, announced: "I cannot countenance the destruction of this landscape. I believe it would be immoral to sit back and let it happen and so I am now prepared to take direct action to break the law." Mr. Croker agreed: If direct action "is the only thing we can do, then we must do it. It's the logical conclusion of the fight." His words were echoed by FOE countryside campaigner Robin Maynard "It isn't too late. Until the contract for the main cutting is let, and until they actually hack right through the middle of the thing and wreck the landscape, it's still worth fighting for. I hope to hell we save it. We just might."

Eventually, in October 1991, Carlo Ripa da Meana, the EC Commissioner for the Environment, ruled that the British government would be acting illegally in developing the site without proper environmental assessment. It looked as though the battle to save Twyford Down might have been won.

That was to reckon without the tenacity of the British government and the road lobby. The government simply defied EC law by bringing in bulldozers. Then in July, during the negotiations over the Maastricht treaty, the new acting EC Commissioner for the Environment, Karel Van Miert, (who also happened to be Transport Commissioner) dropped the EC rulings on Twyford Down, in return for other concessions from Britain. Work, however, was still held up by the presence of the

Dongas. However, the town's prestigious public school, Winchester College, which had made £300,000 from the sale to the DOT of land that had previously been bequeathed to the college for its safe keeping, applied for an eviction order against the Dongas tribe.

The Dongas, however, were not getting the support they needed. Some members of the TDA were behind them but others publicly disowned them. Friends of the Earth had already abandoned the campaign in the summer after a court injunction against a protest camp. Andrew Lees, its head, explained: "We must separate matters of principle from those of pragmatic reality. One of the hardest things is to know when to say 'that's it, we've lost'." With the disappearance of FOE, and the almost total lack of support from other mainstream environmental organizations such as Worldwide Fund for Nature (WWF), there was little to bridge the wide social gulf between the concerned citizens of Winchester on one hand, and the Dongas and other advocates of direct action on the other. A new group emerged, the Friends of Twyford Down, whose main aim was to form links between the two groups, and demonstrate the common ground that they shared — but as one of its members subsequently admitted, "we began far too late".

On the day on which the court-case was due to be held, the DOT, Tarmac and their henchmen moved in. Had all 500 of the TDA, plus the other concerned people in Winchester, plus representatives of Friends of the Earth, WWF and other environmental groups been there to support the Dongas, and refused to move when the security men came in, the government might have had to think again. As it was, when the cock crowed thrice, almost no one remained but a bunch of so-called outcasts.

Enhancing Mobility

During the summer of 1992, it was fashionable to observe that, in the words of *The Times*, "the protest has brought together an unlikely alliance of Tories, New Agers, neo-hippies and eco-radicals" and there were grounds for believing that something hopeful might emerge. What kind of world are my grandchildren going to inherit, asked David Croker; and the Dongas agreed: "this land, all our land, is being trashed, but for what?"

Unlike the Dongas, the TDA proposed an alternative scheme. They wanted a tunnel, costing nearly £100 million, to be built underneath the hill, thus sparing the precious landscape. Not In My Back Yard, they declared, but Underneath it. They were supported in their demands for a tunnel by other organizations, including Friends of the Earth.

A tunnel, though more expensive, would achieve, with less environmental damage, exactly what the government plan would achieve: it would knock five minutes off the travel time between London and Southampton. This five minutes, multiplied by the number of cars that would enjoy it, is a statistically calculable economic benefit, which more consumers and competing businesses would take advantage of. The result would be a corresponding increase in the number of motorists using the new five-minute-faster M3, and a corresponding increase in the intensity of the bottlenecks in its tributary roads.

The M3 link up at Twyford Down is thus but a small part of an apparently unlimited road expansion scheme. In the Wessex region, besides Twyford Down, there are currently over 15 new road schemes costing over £1 million either in preparation or under construction. The projected Salisbury A36 bypass, for

example, will plough a 16-foot-high furrow through the surrounding water-meadows that until recently generated much of the city's wealth, and still assures its placid beauty.

But, in the words of the Dongas, "for what"? For local people, these roads will be a dubious blessing, encouraging them to compete further from home, and hence drive more miles. Office workers in search of a better job will travel not 40 miles to and from work, but 60 or 80. Builders in Bristol will find that a more economical journey enables them to bid for and commute to jobs in Southampton, while correspondingly skilled builders in Southampton will fish for jobs in Bristol.

But more significantly, when the M3, the A36, the A338 and other improved roads connect the Euroports of Portsmouth, Southampton and Poole to a nationwide network of unmitigated dual carriageway, it will give the road-ferry link to the continent a better chance of competing with the high-speed rail link to the Channel Tunnel. As Caroline Jackson, the European MP for the area, wrote in connection with the Salisbury bypass: "For British industry to make the most of the business opportunities presented by the single market, we need to provide the infrastructure, be it road or rail, to cater for their demands." The extra five minutes gained by the destruction of Twyford Down is an essential part of this "infrastructure".

This enhanced mobility is not, of course, restricted to Wessex, but is part of a suddenly expanded nationwide road scheme. Between 1979 and 1989 expenditure on roads in Britain increased, in real terms, from about £850 million to over £1,000 million. In 1989/90 it shot up to £1,350 million and the budget for 1993 is about £1,700 million, twice what it was in 1979. The DOT's current roads programmes threatens 160 Sites of Special Scientific Interest, 800 Scheduled Ancient Monuments, 12 Areas of Outstanding Natural Beauty, two National Parks and 30 National Trust properties — a prospectus that reduces Twyford Down to a trivial statistic. To put tunnels underneath all of these treasured sites might cost in the region of £50 or £100 billion.

Nor is this roadbuilding policy unique to Britain, but part of a concerted scheme to provide Europe with a streamlined road system to match the free-trade aspirations of the 21st century. France plans to double its motorway network by the year 2000, projecting, amongst other schemes, a highway through the isolated reaches of the Massif Central mountains, which will serve mainly to relieve traffic from the already congested Rhône Valley motorway. The European Commission plans another 12,000 kilometres of new motorway by the year 2002, and a 50 per cent growth of the major road network.

This drive for growth flies in the face of more realistic analysis coming from the Ripa da Meanas of the EC bureaucracy. A recent Green paper concludes that "the EC is facing completely unmanageable transport chaos by the year 2010." The only concrete resistance to this mobilization of the continent comes from wealthy Switzerland, the Twyford Down of Europe, which is deeply suspicious of EC plans to drive arterial roads and railway routes through its zealously protected mountains and pasturelands. Will their proposed solution be a tunnel underneath Switzerland?

Resisting Insanity

To what extent have the long-term strategies for European transport influenced the debate and the struggle over Twyford Down? The answer is: hardly at all. The citizens of Winchester

anguished over the destruction of their commons, but proposed nothing more visionary than a tunnel that would simply shovel the bottlenecks elsewhere. Friends of the Earth, despite having a comprehensive understanding of the long term issues of road development preferred, for "pragmatic" reasons, to support the tunnel option. The tactics of Earth First! successfully concentrated press attention on the conflict, but seldom highlighted the underlying issues.

Nor can *The Ecologist* remain immune from criticism. The Dongas are "scathing about environmentalists who, they say, whinge endlessly about the plight of indigenous peoples in the Amazon or Africa and forget their own." The criticism hits home. In 1992, not a word was published in this journal about Twyford Down, until a reader wrote a letter stating that it was one of the "commons" that she felt inspired to defend. Like WWF, we simply weren't where we should have been.

There are two main lessons to be learned from Twyford Down. Firstly, NIMBYs rarely win battles on their own. The success of the grassroots movements against chemical waste incineration in the US (see pp.18-24 *this issue*) demonstrates that when different communities pool their resources, analyse the problem from a wider perspective and insist "Not in Anybody's Backyard", they find the additional strength to maintain the fight. Increasing numbers of people in Britain have become well aware that the government's long-term road policy is lunacy — even though self-interest born of necessity means that they want to drive further and faster every year. To campaign for a tunnel — a vulgar and expensive compromise between that self-interest and the requirements of the road lobby — simply will not work. People are too well-behaved to fight to the bitter end, merely for the right to dump their problems on someone else. But (as the poll-tax débâcle demonstrated) they will fight if they are persuaded that their own particular inconvenience is part of an insanity that threatens the whole of the country.

And secondly, there is no future for the environmental movement as a whole if large mainstream organizations fail to lend their support, or withdraw it at the critical moment. The idealism of people like the Dongas, the well-reasoned respectability of the mainstream environmental organizations, and the parochial

concern of groups such as the TDA, are complementary and mutually supportive. This is precisely the message that the press was so keen to portray. It is hard to avoid the conclusion that the mainstream groups are reluctant to act as a bridge between NIMBYs and visionaries because they are afraid of being tarred with a radical brush. Yet they are well placed to forge constructive alliances; they can achieve this by encouraging tolerance and by clearly stating that there is no future in tunnel solutions — that Not In My Back Yard ultimately means Not On Planet Earth.

The Dongas have put the entire spec-

trum of the British environmental movement to shame; their conviction has exposed the hypocrisy of pragmatism. "This is our home now, and we're staying here. This is a national issue and an international issue. It's about trashing the planet. We live here on the land, and the land gives us hope and energy. We're totally optimistic we can stop it." Twyford Down is still largely intact; the cutting has not yet been "hacked right through the middle of the thing". The Dongas are camped safely on land until January 14. If the people of Winchester and the environmental movement were to give them more support, they might still succeed.

Simon Fairlie

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Ruining the Commons

Coastal Overfishing and Fishworkers' Actions in South India

by

John Kurien

When commons are degraded by overuse, the result is frequently an economic and ecological crisis. In the coastal marine fishing grounds of Kerala in South India, overfishing began with the introduction of modern trawlers, financed by outside interests, but the detrimental consequences have been felt most keenly by the local fisherfolk. The responses of these commoners have been diverse, and in the new circumstances they have sometimes been faced with a dilemma between sustaining a livelihood and sustaining the fishery resources. Attempts by the state government to balance the several social forces that place claims on the commons have resulted in ambiguous policies that have done little to resolve the problems.

Before Independence in 1947, fishing in India was the subsistence occupation of a caste-bound community. The fishing itself was, and still is, practised exclusively by men, while processing and sale is the domain of women. Over the centuries, traditional marine fishing communities evolved a keen understanding of the aquatic ecosystem, and perfected diverse technologies and artefacts which were appropriate to fishing as a source of modest livelihood. But with the onset of post-independence economic planning, the fisheries came to be regarded as a sector which could accelerate the growth of the rural economy by augmenting export earnings and generating new employment opportunities. In order to meet this objective, the "modernization growth-oriented" model of development, largely premised on the experience of the more developed temperate water countries, was accepted. This involved the superimposition of a modern, capital-intensive, specialized technology over the largely labour-intensive traditional base, which was generally assumed to be a hindrance to development.

A key factor in this development was the UN-assisted Indo-Norwegian Project, the first bilateral development project in the Third World, which was initiated in three villages in Kerala in 1951. Its

John Kurien is an activist researcher supporting fishworkers' movements in India and in other Third World countries. He is presently associate fellow of the Centre for Development Studies in Trivandrum.



Mark Edwards/Still Pictures

original aims were to upgrade traditional craft and processing methods and to raise local people's living standards. But there was little initial success; after Norwegian experts had pronounced (erroneously) the local boats unsuitable for mechanization, the project became focused on introducing Western-style trawlers and freezer technologies for processing.

By the mid-1960s, the trawling industry was growing steadily, mainly because of the demand for prawns in Japan and the USA, whose supplies from China had been cut off by the 1949 revolution. The prospects of profits from export earnings attracted outside investment. The earlier caste-bound nature of the fishery sector ceased to be a barrier to entry, and the main investors in the new development

model were not fisherfolk but local capitalists.¹ For a decade — until the mid-1970s — it was smooth sailing. However, after 1974, the overall levels of the fish and prawn harvest began to fall, and by the end of the decade, the marine fishery sector of the state was heading towards an ecological crisis of overfishing.

Causes of Overfishing

In Kerala five major factors contributed to excessive fishing:

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When traditional technologies and the custom-bound organization of the fish economy predominated, technical barriers, such as the need to have fishery-specific skills, and social barriers, such as fishing being the occupation of a lower caste, prevented free entry of capital and persons from outside the traditional fishing communities into the fishery.

The introduction of mechanized boats and the perceived profit opportunities from involvement in activities such as prawn exporting changed this situation considerably. The vigorous merchant class of Kerala took the first initiatives to break these barriers. They shifted some of their capital from land-based activities to the fishing, processing and exporting of prawns. Rapid entry was facilitated by the free access to the sea: mechanized boats could be operated without any form of licence or registration. Entry into the

Kerala's traditional fishermen have a keen understanding of their local fishing grounds and the exigencies of the marine ecosystem. They have perfected technologies that are appropriate to the environment and rules that protect the fisheries whilst still providing a modest livelihood.



Mark Edwards/Still Pictures

fishery was given further impetus by the liberal financial assistance of the state. As a result, there was an influx of non-fishermen owners of fishing assets — particularly of mechanized trawlers. Between 1966 and 1985 the number of trawlers increased from a couple of hundred to around 2,800.

• Inappropriate Technology

Traditional fishing technologies (nets, tackle and methods of fishing) in general evolved to suit specific marine conditions and the varying behaviour patterns of the fish. Fishing nets were designed to catch only certain species; and fishermen used methods that were essentially passive — in other words, rather than actively pursuing the fish or catching them by disturbing their milieu, they only caught those that happened to get entangled in the net.

Modern fishery development, however, introduced active techniques adapted from fisheries in temperate waters, in particular trawling (scraping the seabed with a bell-shaped net for demersal or bottom dwelling fish), and purse-seining, (encircling whole shoals of pelagic or surface dwelling fish). Both these techniques were capital-intensive and in the short-term raised labour productivity. Unit harvesting costs were low, and given the high prices of certain species of fish, the profits to owners were high. The result was a rapid increase in the use of these techniques, which contributed significantly to overfishing by destroying the sea-bottom eco-niche, in the case of trawling, and through the indiscriminate fishing of whole shoals, in the case of purse-seining.

• Booming Demand

The introduction of trawlers into Kerala coincided with the rise in demand for prawns in the international market. This demand was outside the control of the local economy, and it was difficult to prevent fishery resources from being harvested in response. From a commodity which once provided manure for coconut palms, prawns became the “pink gold” of marine exports from India. In 1961-62 the beach price of prawns was only 240 rupees per ton; by 1971-72 it had risen to 1,810 rupees.

• State Subsidies

To foster modernization, the state of Kerala actively promoted investment in the fishing sector, instituting many attractive subsidies, investing in capital-intensive facilities such as harbours and landing centres, and providing training facilities. In theory, all the 1,200 mechanized boats subsidized by the state between 1961 and 1978 went to fish-worker cooperatives or groups of genuine fishermen, but in practice, this seldom happened. A government report concluded that “the failure in the operation of the scheme of distribution of mechanized boats were due to the fact that the fishermen cooperatives . . . were all *benami* [under false names] cooperatives almost without any exception. The rich and influential among the fishermen sponsored and controlled the cooperatives.”² This prompted a revision of the subsidy regulations, so that from 1985 onwards, state subsidies were enjoyed by genuine fishermen for the first time. The rapid increase in outboard engines in Kerala State, from a handful in 1982 to as many as

8,000 in 1988, is, to a small extent, due to these incentives.

• Pressure on In-Shore Waters

In tropical water fisheries, the overuse of even relatively unproductive, passive fishing gear can affect the renewability of stocks.³ The pressure exerted by increasing numbers of fishermen within the limited area of the Kerala coastal waters could exacerbate the extent of overfishing if present trends continue. The active fishing population has been increasing at a rate of about 2.3 per cent per annum. In 1961, each fisherman had, on average, 16 hectares of coastal commons to fish. By 1985, the number of fishermen had increased by 65 per cent, reducing the average coastal commons per fisherman to 9 hectares, while the number of traditional craft had increased from 21,000 in 1961 to 27,000 in 1986.⁴

The Evidence of Overfishing

After the steadily increasing harvests of 1956-1973, there has been a decline both in the catch per hour worked and in the size of the fish caught. For example, in the main prawn landing centre in Kerala (Neendakara) the catch per unit effort declined from 83 kilogrammes an hour of fishing effort in 1973 to 20 in 1984.⁵ An analysis by one of the leading fishery scientists of the country also showed significant decreases in the size of the shrimp caught, causing him to warn of the “depletory tendencies noticed in the shrimp fisheries of Kerala and another point of concern from the conservation approach”.⁶

Another overall indicator, pointing at

least to the possibility of ecosystem overfishing, is the decline in the catches of the demersal species of fish. These bottom-dwelling species are seldom affected by natural changes in the ecosystem, and declines in their harvests can be attributed to man-induced interventions. Between the years 1971-5 and 1981-5, the harvests of nearly all the important demersal species declined sharply. This can largely be attributed to excessive or destructive fishing — particularly the use of trawlers.

The decline in fish stocks severely affected the profitability of the industry. In 1968-69, trawlers in Kerala (above 10 metres in length) obtained a 14 per cent return on their investment, after depreciation and interest.⁷ By 1978 this figure had dropped to 8.6 per cent,⁸ while results of a study sponsored by the United Nations Development Programme and the Food and Agriculture Organization indicated that in 1980-81 trawlers landed significantly fewer fish while incurring larger total costs. This resulted in a negative average rate of return.⁹

But the decline in profits did not prevent the industry from continuing to expand, partly because many of the owners with convenient political connections simply defaulted on repayment of their loans. In March 1986, a provisional estimate of the Kerala government assessed the total accumulated arrears on government loan repayments due from mechanized boats (mostly trawlers) to be 30 to 40 per cent of the total costs of these boats.

Suffering the Consequences

As productivity has declined, the major economic brunt of overfishing has been borne by fishworkers and their families. Trawler crews which harvested 10 tons of fish in 1974 landed only 7.7 tons in 1982, and their real per capita incomes fell by 45 per cent. In the case of the artisanal fishermen, the extent of setback was similar. Productivity registered a 50 per cent decline between 1974 and 1982, and real per capita incomes dropped from 850 rupees to 420.

Overfishing has not only reduced the income levels of the working fisherfolk, but has also increased the level of disparity between them and the non-worker owners of mechanized boats. From a small share of 12 per cent of the total value of fish output in 1969, the slice of the fish-pie

To foster modernization, the state of Kerala actively promoted investment in the fishing sector, instituting many attractive subsidies, and investing in capital-intensive facilities.

taken by owners increased to 27 per cent in the boom period of 1974. Thereafter, as overfishing set in, their share increased further, reaching 43 per cent by 1982. The increase in the number of mechanized boats and their owners between 1969 and 1982 partly explains the increase in their shares.

Meanwhile the adverse nutritional impact has been borne by the local consumers — particularly the poorer among them. The availability and quality of fish sold in the markets have deteriorated, and retail prices have increased faster than the general cost of other food items.¹⁰ While middle- and higher-income households may shift more readily to other sources of protein, poorer consumers do not change their diet patterns easily, and are therefore the ones most affected by this scarcity of fish. Per capita availability of locally consumed fish has decreased from around 19 kilogrammes in 1971-72 to around 9 kilogrammes in 1981-82.¹¹ Investments in fisheries development have yielded less fish for domestic consumption.

The Making of a Popular Movement

The reaction of the fisherfolk to the degradation of their commons and the decline in their standards of living took the state government by surprise. Fisherfolk in Kerala, as in every other part of India, are a marginal group, with little economic power or political influence. The adherence of fishing communities to organized male-dominated religions, particularly Roman Catholicism and Islam, have led them to be regarded as “vote-banks” for the conservative political parties who generally get the backing of organized religious forces. The more progressive political parties with secular policies and working class concerns have considered traditional artisanal fishworkers an “unstrategic” group whose votes they could in any case hardly hope to win.

It was in this context in the mid-1960s that social activists, predominantly from Christian backgrounds, began systematic work among the fishing communities. They raised the issue of social justice and encouraged participation in fishworkers' cooperatives, women's clubs, youth clubs and other organizations. These initiatives were not a mass movement, but by the mid-1970s they were widely scattered along the coast of Kerala and remained as “critical and creative irritants” on the periphery of broad traditional socio-religious structures.

Through their efforts at providing credit, introducing intermediate technology, facilitating organized fish marketing and forming credit unions among women fish vendors, these social activists came to have an intimate working knowledge of the problems of the fishing communities. However, throughout these initial years, the “bounty of the sea” was taken for granted. The basic problems of fisherfolk were seen to stem from the “sharks on land” rather than the lack of fish at sea. It was a problem of getting a fair price for fish — not of getting fish.

But by the end of 1977, it was becoming clear to these activists that fisheries development policies had become grossly divorced from development priorities of fisherfolk. In the neighbouring states of Goa and Tamil Nadu, fishermen, with the active encouragement of non-party social activists, were combating trawlers, owned by non-fishermen, which were mercilessly ramming their small craft and cutting their nets.

These confrontations inspired a new sense of unity among Kerala fisherfolk over the common problem of the increasing ingress of trawlers into the coastal waters. The vast majority of the artisanal fishermen were either owner-operators of small fishing units, or employed as share workers on them. After considerable discussion, an association to pressure the state from below finally took shape in the form of an independent trade union. This was an anomaly in the political context of Kerala, where trade unions were nearly always associated with political parties.

The new organization was called the Kerala Swatantra Malsya Thozhilali Federation (KSMTF: Kerala Independent Fishworkers Federation). While the social activists were predominantly Christians, the fisherfolk who rallied around them were from among the Christian, Hindu and Muslim fishing communities a fact that created concern in the established



Mark Edwards/Still Pictures

Enter the Outboard Motor

While the artisanal fisherfolk struggled at the state level for management and control of access to the coastal zone, in their own fishing operations they became more open to technological innovations, particularly in the central maritime districts of the state. The most important of these was the outboard motor which, when used to propel traditional craft, reduced drudgery and enabled them to fish deeper waters and to use more active fishing gear, including mini-versions of trawl nets and purse-seine nets. The new and more liberal post-1981 import policies of the Congress national government made outboards from Japan easily available in the market. Between 1982 and 1984, the number of outboards issued under government subsidy schemes alone reached 1900.

Initially fishermen using outboard motors were seen to harvest more fish than those who continued to operate the non-motorized craft; and non-owner fishermen exhibited a definite preference for working on motorized units. However, there was a significant rise in operating costs and a degree of uncertainty due to unfamiliarity with the deeper water fishing grounds. Many fishermen preferred to continue fishing in the overfished coastal waters for longer periods of time, using the new more aggressive fishing methods that the outboard motors made possible.

The economic impact of this quiet wave of change in the artisanal fishery sector did not engage the KSMTF leadership until members from the central district argued that "subsidies and greater quotas of fuel for outboard motors" should be included in the list of demands to the government. This trend towards motorization, while it surfaced as a contradiction within the ranks of the KSMTF, did not deflect the union from its prime demand for the monsoon trawl ban.

The 1984 Struggle

In 1984, the KSMTF renewed its campaign for a monsoon trawl ban and for stricter enforcement of the zone regulations. The call led to great social upheaval in the coastal belt for well over two months. There were massive processions of fishworkers and their supporters in key administrative cities and towns. The main highway crossing the length of the state was blocked with canoes at several points

The adoption of outboard motors as a result of the pressures of competition on coastal waters have allowed local fishermen to pursue fishing methods, such as the use of ring seines, that are proving unsustainable. There has been growing resistance from older traditional fishermen to the use of ring seines.

religious circles — particularly the Catholic Church. They considered such a secular movement, in which clergy and nuns played a vital role, to be too "radical".

Collective Action to Safeguard the Commons

In 1981, the KSMTF spearheaded the movement of artisanal fisherfolk demanding measures to regulate fishing by trawlers in coastal waters. Their primary demand was for a trawl ban during the monsoon months of June, July and August, arguing that it was during this time that many of the important species of fish spawn in the coastal waters. They also demanded effective enforcement of a trawler-free coastal fishing zone, reserved exclusively for artisanal fishermen operating non-mechanized craft, and for a total ban of purse-seiners from Kerala's waters. Subsidiary demands for greater social welfare measures were also included.

A combination of *nirahara satyagrahas* (fasts), *rasta rokos* (road blocking) and massive processions before the government secretariat in Trivandrum, the state capital city, was used to get public attention and action from the government. The impressive turnout of women of the community in the forefront of the processions and the militant, yet disciplined character of the demonstra-

tions, surprised the press and the police — the latter had always been cautious with fisherfolk whom they had considered to be "volatile, unruly and easily provoked".

The fact that an independent trade union had championed so popular a cause and triggered such social upheaval caught the political parties in the state unawares. All the major parties, created new fisherfolk organizations so as to be able to claim that they too were part of this historic awakening.

The state government at that time — a coalition of Muslim and Christian interests and some leftist parties — was confronted with the dilemma of simultaneously having to please the agitating fisherfolk and the powerful lobby of trawler and purse-seiner owners and fish exporters. It responded by enacting the Kerala Marine Fisheries Regulation (KMFR) Act which provided a legal framework for zoning the coastal waters into areas reserved exclusively for artisanal fishermen using non-mechanized craft, and areas further from shore for trawlers and purse-seiners. But implementation of the Act was delayed because the government pleaded its inability to enforce the law, because of the lack of technical and financial resources. However, measures were quickly taken to implement the welfare schemes — educational grants for children, accident insurance, more liberal credit, housing loans and the like.

on several days, railway tracks were picketed and the road to the airport in Trivandrum blocked. The spirited involvement of the women and young children of the fishing community was crucial in gaining the sympathy of the public, while fasts by a Hindu fisherman and a Catholic nun in Calicut became the spotlight of media attention. The KSMTF organized fund-raising campaigns among the public, stressing that fish consumers should support the artisanal fishworkers as they, rather than the trawlermen, were the main suppliers of fish for local consumption.

Due to strong pressure from the trawler-owner lobby and the prawn exporters, the government did not yield to the major demand for a three-month monsoon ban. Such a step, it argued would involve phenomenal "costs" and cause a massive fall in the state's foreign exchange earnings and put trawler crew and processing plant workers out of work. The government also warned against "militant" unionization and tried to placate groups of fishworkers which they perceived to be only "peripherally associated to the KSMTF" with direct financial assistance, in the form of attractive subsidies and soft loans to buy outboard motors and new fishing gear.

Finally the government set up an investigative committee which submitted its findings in mid-1985. The committee warned the government about the crisis which could affect the coastal waters if the existing configuration of fishing assets and fishing effort continued to grow in an unregulated fashion. It did not approve the need for a monsoon trawling ban but favoured halving the size of the trawler fleet. It recommended the use of more passive fishing techniques of the type used by artisanal fishermen, favoured a total ban on purse-seiners, cautioned the government and the artisanal fishermen about the massive motorization drive upon which they had embarked, and highlighted the need for active fishermen's participation in managing the coastal commons. But the main recommendations of the committee remained on paper only, and efforts by the KSMTF in 1985 and 1986 to commit the government to implement them were futile.

More Motorization and New Fishing Gear

The continued drive toward motorization made the average level of investments by

artisanal fishermen in craft, gear and engines soar, in some districts to 10 or 15 times the 1980-81 levels. Motorization resulted in fishing in deeper waters leading to an increase in productivity and harvesting of new species. In the central and northern maritime districts, motorization gave a big boost to the use of fine meshed encircling nets called "ring seines" to harvest pelagic shoaling fish like oil sardines. These ring seines were nothing but smaller versions of the larger destructive



Jim Holmes/Environmental Picture Library

As soon as the small boats land on the beach, the women take over, loading 10-20kg of fish onto head baskets to take them to market. Women's livelihoods have been curtailed by trawling and more advanced technologies, such as freezing, as the markets for dried and salted fish have closed.

purse-seine nets which the traditional fishermen had vehemently opposed.

The incomes of the non-owner workers probably increased in the initial years of motorization, but this increase has been rather short lived since. The increased harvests often resulted in lower beach prices, since the fishworkers had little control over the marketing, and the costs of fuel and repair of the engines, reduced net profits. The need to replace the imported engines after two or three years, and their rising costs, often drove the owners into debt. An immediate response was to alter the share patterns in favour of capital, thus depressing the incomes of the workers.

New tensions arose within the traditional fishworker groups. In some areas

the traditional fishermen — particularly the older among them — opposed the introduction of the ring seines. They argued that, whatever the initial benefits, such nets would only accentuate the resource crisis in the long run. Nonetheless, the government, through its fisheries development organization, actively promoted the earlier subsidy scheme for the purchase of outboard motors and introduced a new one for ring seines. This trend further accentuated tensions and in some areas traditional fishermen who continued to use conventional fishing gear violently attacked and burnt the ring seines.

Despite these intra-sector problems, the KSMTF claimed that the principal problem in the fisheries sector was still the damage to the ecosystem caused by the trawlers. They argued that the drive for motorization and the adoption of ring seines and mini-trawls were only measures taken to beat the trawlers, and that once this root problem was addressed with appropriate state intervention, the artisanal fishermen would automatically give up their destructive fishing methods.

In some of the KSMTF strongholds where the trawler menace continued unabated, the fishermen used their faster motorized boats to apprehend trawlers and purse-seiners that violated the zoning regulations, thus forcing the government to take action under the KMFR Act. By taking on the self-appointed role of policing the coastal commons guaranteed under the KMFR Act, they demonstrated to the state the usefulness and the inevitability of fisherfolk participating more formally in managing their fishing grounds.

Group Initiatives

In Trivandrum District in the southern end of the state where there was no introduction of the ring seine or the minitrawl, there was a revival of an old practice of creating artificial fish sanctuaries or artificial reefs on the sea floor of the coastal waters.¹² Between 1985 and 1988, a movement rapidly spread to create people's artificial reefs (PARs) totally funded and erected by the fishermen — at times with the collaboration of social activists and marine scientists sympathetic to the cause. PARs became the symbol of the attempts of the fisherfolk at "greening their coastal commons". Constructing PARs revived the accumulated, transgenerational knowledge of the ma-

rine environment, which had been relegated with the coming of more "efficient" but less ecologically sophisticated fishing gear. PARs also served as appropriate physical structures for the fencing of exclusive fishing zones against the incursions of trawlers. Finally, being largely group and village initiatives, PARs reinforced the power of the community.

The localized success of PARs in rejuvenating the coastal commons, and the higher and more valuable fish harvests obtained from around them, prompted the government to consider sponsoring an artificial reef programme. The KSMTF has, however, opposed such a move for fear that such sponsorship will deprive PAR construction by the fisherfolk of its spontaneity, diversity and autonomy — three ingredients essential for their success and sustainability.

Trawling Bans: Economics and Politics

In 1988, the KSMTF and the other fishworkers' unions threatened to begin their pre-monsoon agitations. In response, the government promulgated a partial ban, by which all the trawler operating centres in the state — except the largest one, Neendakara — were ordered to close for the months of July and August. The partial ban was ineffective, because it could not prevent trawlers from the other centres operating out of Neendakara. The continuing conflicts, both between traditional fishermen and trawlermen, and amongst the traditional fishermen themselves over the use of nets such as ring seines, prompted the government to constitute a third expert committee which submitted its report to the government in June 1989.

The government decided to implement immediately one of the recommendations made by the committee: a total monsoon trawling ban from mid-July to the end of August, 1989. This was the most important fishery management decision made by any government in the country since Independence. The other recommendations, which included restrictions on the use of ring seines and the size of outboard motors, were kept in abeyance.

In October 1989, two months after the ban was lifted, very large pelagic fish landings were reported from all over the state. Though natural phenomena may account for much of this increase, the non-disturbance of the ocean during the monsoon months probably contributed

In the long term, as in the short, it is coastal commons and the working fisherfolk, rather than capitalists, that will be most affected by overfishing: the capitalists can easily move out of the fishery while the fisherfolk are more or less tied to it, through a lack of alternative economic opportunities. The fishworkers' future lies in the sea and its common resources.

significantly to the more pronounced shoreward movement of the pelagic fish shoals in pursuit of food which is found in abundance in the coastal waters areas cooled by the inflow from rivers swollen by the monsoon rains. The ability of the motorized units — particularly those using ring seines — to harvest whole shoals also provides an important reason for the increased harvest.

The increased landings depressed shore prices, and retail market prices dropped drastically. As in the 1950s, fresh sardines were sold as manure for coconut plantations. It is unlikely that this bumper harvest had a positive effect on incomes of fisherfolk, but it certainly provided a temporary boost to the nutritional status of poorer fish consumers.

At the KSMTF's annual convention in May 1990, there was elation over the trawl ban, but there was also considerable soul-searching over the hasty adoption of motorization and new super-efficient fishing gear. The morality of demanding a trawl ban, when many of them were now using equally destructive fishing gear, was sharply questioned.

The 1990 Set Back

The success of the 1989 ban, and the credit which the government took for implementing this, led the fisherfolk and the trawler owners to assume that a trawl ban in the monsoon of 1990 was a foregone conclusion. Only the date of commencement was to be decided. But the newly-elected National Front government of India was facing a foreign exchange crisis, and was exerting pressure on the state government not to enforce a ban.

With no announcement of the trawl

ban even after mid-June 1990, the fisherfolk became restive. KSMTF blockaded the government marine export offices in Cochin, and the KSMTF president commenced a *nirahara satyagraha* at the gate of the government secretariat in Trivandrum. The fishworkers' unions of the ruling left parties and the conservative opposition parties held separate rallies demanding that the ban be announced. Even the trawler owners agreed to a short trawl ban in the coastal waters, provided that permission to fish in the deeper waters was guaranteed.

On 28 June 1990, the government finally announced the monsoon trawl ban, together with certain technical specifications concerning trawlers which intended to fish in the deeper waters outside the coastal commons. However, unlike earlier years, it did not specify the duration of the ban, a move viewed with suspicion by the KSMTF. They had received information that a deal had been struck between the boat owners' representatives and a minister in one of the ruling parties who had close links with the marine export lobby.

The boat owners accepted the trawl ban but took the government to court on the second order concerning deep water fishing. Meanwhile the prawn exporters decided to pressure the government over the payments they made to the fishermen's welfare fund, complaining that during the trawl ban they were starved of raw material supplies. They refused to buy prawns from the artisanal fishermen who were netting bumper harvests unhampered by the trawler operations.

This boycott caused a crash in prawn prices. Prawns suddenly became available in the local markets at rock-bottom prices that urban consumers could afford. The boycott exposed the inability of the government-sponsored fishermen's cooperative federation to intervene in the market and the inadequacy of the KSMTF's strategy of struggling to conserve resources without ensuring that their members were assured a fair price for their fish. The credibility of the government and the morale of the fisherfolk were at their lowest ebb.

Then, the government committed what the KSMTF considered to be an act of total betrayal. It withdrew not only the second order relating to deep sea fishing, but also the monsoon ban itself, even though this had never been challenged by the boat owners. The official justification given for lifting the ban was that an in-

verse correlation was noted between the length of the bans in 1988 and 1989 and the increase in the fish harvest thereafter. Such perverse logic was an insult to people's intelligence, and the real motives for the lifting of the ban became the subject of debate. It became apparent that when the main left party in the government had to choose between remaining in power and being committed to measures to ensure the sustainability of the commons, it chose the former.

Towards Resolving the Crisis?

In the last two years, little has been achieved to resolve the deadlock between the various interest groups. In 1991 and 1992, there were monsoon trawl bans, but with little commitment to enforce them on the part of the government, which tends to regard them as a vote-catching welfare measure, rather than as a form of fishery resource management. Deep-sea trawlers have been caught fishing in the area of the ban, and have failed to comply with safety regulations, and the KSMTF are presently challenging these abuses in court.

The relentless increase in the number of outboard motors has resulted in more pressure on the coastal fisheries. The bumper catches of 1990 and 1991 of up to 600,000 tons — well over the estimated maximum sustainable yield of 480,000 tons — were followed in 1992 by a significantly smaller catch. The ring seine fishery in Central Kerala has collapsed through overfishing, and these operators have been taking their gear further north, where they have encountered resistance from older traditional fishermen.

In spite of the conflict between different interests, there is a growing recognition that a conciliatory approach is necessary. The opening up of the Indian economy¹³ has brought to the fore an enemy common to both the trawler-owners and the artisanal fisherfolk — namely penetration of the industry by multinationals. Already large-scale joint ventures are being contemplated. This threat, together with the increasing technological and political power of the artisanal fishermen and the general recognition of the state government's incompetence, is forcing a degree of participation of all the interest groups in the protection of the coastal commons.

But so far the conflicting claims and motivations of the various interest groups have failed to prevent Kerala's fisheries

from lurching towards a crisis. In the long term, as in the short, it is coastal commons and the working fisherfolk, rather than capitalists, that will be most affected: the capitalists can easily move out of the fishery while the fisherfolk are more or less tied to it, through a lack of alternative economic opportunities. The fishworkers' future lies in the sea and its common resources. The capitalists have a short-term perspective: the profits from indiscriminate harvesting of the commons are proportionately higher than the profits from regulated and sustainable harvesting. For them, it actually pays to bring ruin to the commons.

This dynamic could be avoided if ownership of harvesting technology — fishing craft and gear — were restricted, by legislation, exclusively to those willing to fish. A community of workers and working owners should be entrusted with the collective rights and responsibility of managing the coastal commons within the jurisdiction of their decentralized operations.

The scale and type of harvesting technology should be in consonance with the known biological and ecological parameters of the resource. Small-scale fishing crafts using multiple sources of energy, selective fishing gear and operations from decentralized centres along the total length of the coastline should be encouraged. Economically efficient but ecologically destructive fishing artefacts should be strictly controlled. Efforts to enhance the biological productivity of the coastal waters, such as the collective creation of artificial reefs in coastal waters, should be given adequate encouragement.

Moving to the hitherto unfished deeper waters is an essential step to reduce the pressure on the coastal commons and a way of diverting some of the excess investment in the coastal waters. Fresh investments in the deep sea should be preceded by thorough resource estimation surveys and economic viability studies. These need not be excessively preoccupied with export potentials. Subsidies to those who move out to these waters may be more economically and socially justifiable.

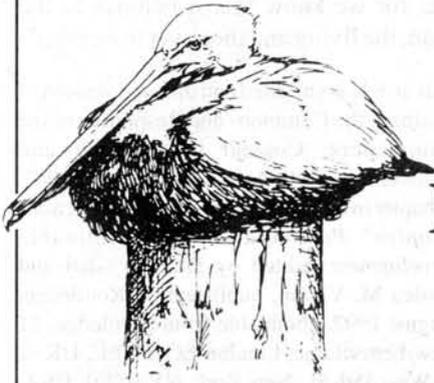
The above options provide the basic policy framework to pull Kerala's fishing economy out of its ecological crisis and provide a sustainable future for the fishery resources in the coastal commons and for the commoners. The artisanal fisherfolk of Kerala stand poised with over a decade of struggle behind them and an

uncertain future ahead. In the words of an old fisherman, "our only hope lies in the sea, for we know that it belongs to the dead, the living and those yet to be born".

This article is an edited and updated version of "Ruining the Commons and Responses of the Commoners: Coastal Overfishing and Fishworkers' Actions in Kerala State, India", a chapter in *Grassroots Environmental Action: Peoples' Participation in Sustainable Development*; edited by Dharam Ghai and Jessica M. Vivian, published by Routledge, August 1992, obtainable from Routledge, 11 New Fetter Lane, London EC4P 4EE, UK or 29 West 35th St., New York, NY 10001, USA. The studies in this book emerged out of a research programme of the United Nations Research Institute for Social Development (UNRISD). A list of its publications can be obtained from the Reference Centre, UNRISD, Palais des Nations, CH-1211 Geneva, Switzerland.

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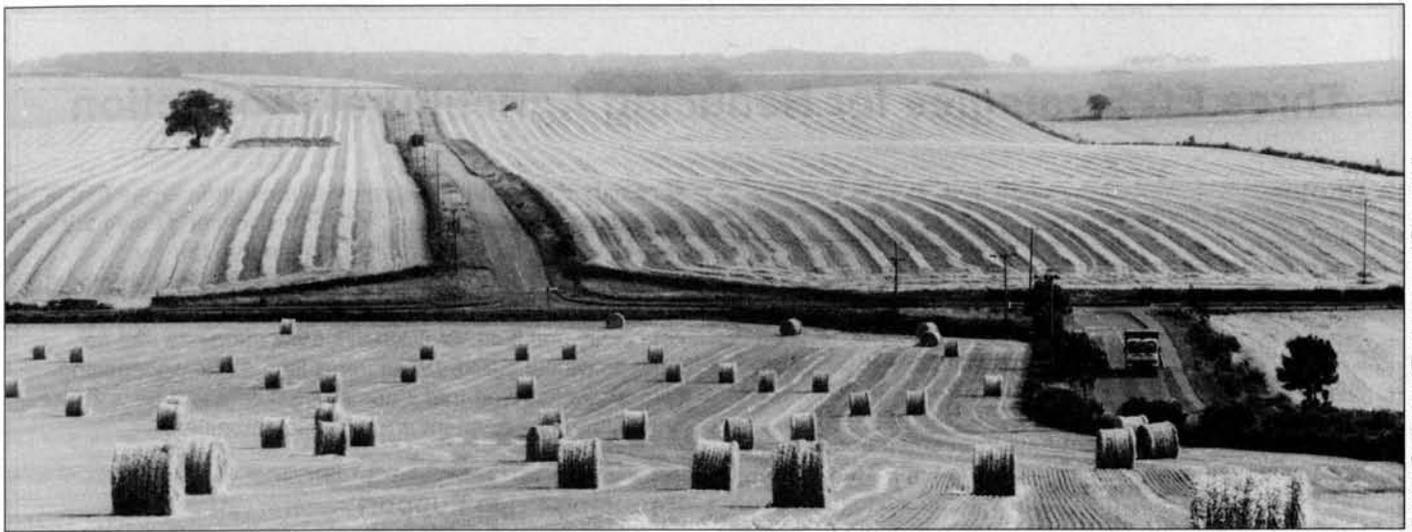
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Taxing Nitrogen Fertilizers

by
Tracey Clunies-Ross

Recent attempts to limit agricultural overproduction have concentrated on measures such as quotas, set-aside and reduction of price support, which are targeted at output. A contrasting approach is to discourage the use of certain agricultural inputs by taxing nitrogen fertilizers. Proponents claim that this would restructure industrialized agriculture in a way that would not only check overproduction, but would also be less environmentally damaging.

It is now recognized that the twin agricultural problems of overproduction and environmental degradation are an inevitable result of the types of agricultural systems which have been adopted in industrialized countries. But although environmental concerns, such as water and air pollution and soil loss, are now being forced up the agenda, it is the problem of over-supply of food which has long been the most serious cause of concern for mainstream policy makers in the EC and the US.

Because of the strategic importance, in the post-war era, of maintaining a continuous supply of food, and of not becoming over-reliant on imports, the US and EC both adopted policies that provided farmers with incentives to increase production. For both trading blocs this has involved investing substantial sums in attempts to smooth out price fluctuations, either through price support and tariff barriers, or through deficiency payments to farmers when the price they received for commodities dropped below a target price.¹

By the 1980s, when many countries were producing surpluses and attempting to export them onto a saturated world market, agricultural support schemes were becoming increasingly expensive. At this point, the EC and other trading blocs began to introduce a number of schemes designed to reduce the impact of agricultural support on the exchequer. These have concentrated primarily on three areas: the first being to limit output through quotas or similar mechanisms; the second, to reduce prices of agricultural commodities; and the third, to retire land from production. None of these has been especially successful at

limiting surpluses, and in many cases they have had a deleterious effect upon the environment or rural communities (see Box, p. 14).

Against this background, a growing minority has begun to argue that both surplus and environmental problems are related to the intensity of production and that this is the fundamental issue to be tackled. In the words of Winifried von Urff, of München-Weihenstephan University in Germany, "Economically, the intensity of production is too high because surpluses are being generated which are not absorbed by the public, so that high public expenditure is required to place them on the world market. Ecologically, the intensity of production is too high because it entails the risk of environmental pollution."²

Those who consider cheap mineral fertilizers to be the driving force behind intensification³ are beginning to call for the introduction of taxes upon these products — eco-taxes, as they are called — in order to reduce agricultural intensity. In practice, the close relationship between use of nitrogen and the effectiveness of other nutrients and pesticides has led to attention being focused on measures to reduce nitrogen usage; though potentially eco-taxes might be placed on any fertilizer input, on pesticides, or even on energy.

Environmentalism versus Supply Control

So far, discussions in the EC have centred on small "environmental" taxes, rather than large "supply control" taxes. Even those who advocate allowing the market to determine the best mix of inputs to produce food in the most cost-effective way

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Three EC Strategies for Reducing Agricultural Production

Quotas

Although quotas may seem a logical solution to over-supply problems, they do have many drawbacks. In the EC, quotas were allocated to existing milk producers according to their production in a reference year: intensive producers, extensive producers and organic producers, small and large, were all expected to cut back on production. Although quotas can be purchased, their cost effectively prohibits new entrants from entering dairying, and the industry has become frozen in time. Those who had a big herd at the time of quota introduction have done very well, adding the value of a large milk quota to their assets; but some of those who had much smaller concerns were pushed beyond the margins of profitability.

As a supply control measure, quotas can be relatively successful, but they fossilize existing patterns of production, often exacerbating existing inequalities, and do nothing to tackle problems of environmental degradation. Moreover, imposing quotas in one area means that expansion is only possible in other areas. A domino effect is created in which quotas are imposed in more and more areas, making it increasingly difficult to introduce wider reforms along sustainable lines.

Set-Aside

The withdrawing of land from production, or set-aside, which is now a major plank of the reformed Common Agricultural Policy (CAP) of the EC, has been widely criticized by a variety of groups. When land is taken out of production, there is an inevitable tendency to try to work the land left in production more intensively in an effort to maximize returns. This in turn often exacerbates existing environmental problems. Land set-aside policies have in some ways divided environmentalists: groups interested in

special habitats and landscape features often argue that it is better to farm part of the land intensively and leave the rest as wildlife habitat; others maintain that farming intensively in some areas, while abandoning land in other parts, is an irrational approach to environmental problems, especially pollution. Overall, evidence suggests that set-aside is widely disliked, that it has little effect on reducing overproduction and that it has a negative effect on agricultural employment and rural communities.

Reducing Price Support

The reduction of target prices for farm produce is now an integral part of the reformed CAP, which will reduce cereal prices by 29% over the three years from 1993-5. In theory, price reduction leads to more efficient allocation of resources within agriculture; in practice farmers are forced to push their land harder and harder, ignoring the environmental consequences, and often increasing output in the short term. As prices fall, the farmers worst affected are those in marginal areas, where it is most difficult to make a living from agriculture, and yet where it is often equally difficult to find alternative employment. Such farmers are likely to employ every means of staying in business, however environmentally damaging, until they are forced off the land.

In the long term, price reduction encourages even greater specialization in regions — intensive animal production in The Netherlands, cereal production in eastern England and the Paris basin, abandonment of land in southern Spain and Wales. The policy exacts a very high price on the farming community. Already in the UK financial problems have led to a significant rise in the suicide rate amongst despairing farmers: farmers are twice as likely to commit suicide as the average person.

recognize that the market does little to protect public goods, such as landscape, or to prevent negative externalities, such as the impact of drainage on those downstream.⁴ A small tax on nitrogen, or any other environmentally damaging practice or input, in order to provide the revenue to counter the negative effects with which the market is not able to deal, is potentially acceptable to both policy makers and mainstream economists. Such a tax can be seen as an extension of the "Polluter Pays Principle", now widely advocated by policy makers within the EC. If kept separate from general revenue, it can be used to reverse environmental damage, or to reward those who are not causing the damage, or to undertake research into methods which are intrinsically less damaging.

Critics of the "Polluter Pays Principle", on the other hand, argue that the imposition of relatively small taxes merely enshrines the polluter's right to go on polluting. If the financial penalty for polluting is not sufficiently severe, it will be in the polluter's interests to pay it, rather than to alter practices. For this reason, groups such as Greenpeace International are calling not for small revenue-raising taxes, but for large and progressive taxes to phase out both nitrogen and pesticides.⁵ They argue

that as both nitrogen and pesticides are known to cause environmental damage, policy makers should be attempting to shift farmers towards "best environmental practice", employing the "Precautionary Principle", rather than the "Polluter Pays Principle". They point out that a number of EC Member States have already committed themselves to the application of the "Precautionary Principle" under the Helsinki and Paris Commission Agreements on marine pollution and at the Third North Sea Conference.⁶

Eco-taxes for Surplus Reduction

The difficulty, however, with attempting to reduce output through the use of eco-taxes, in particular a nitrogen tax, is that the increased yields derived from the use of nitrogen are very great compared with its cost. In practice, this means that a small tax of 10, 20 or even 50 per cent would have very little effect on the amount that farmers used. In order to achieve a reduction in nitrogen use of 30-35 per cent, Alex Dubgaard, a Danish economist, estimates a tax of 150-200 per cent would be

necessary.⁷ Gunter Weinschenck, a German economist who has been working on the concept of eco-taxes for many years, now talks of the possible need to introduce taxes as high as 400-600 per cent.⁸ These levels of taxation are thought necessary merely to reduce the surplus problems within the EC to manageable levels; presumably a tax intended to phase out the use of nitrogen altogether would have to be substantially higher.

The major advantage of a tax on nitrogen as a supply control measure is that it would have a much less damaging effect on farm incomes and the rural economy than either price reductions or land set-aside. Within the EC, the grain surplus amounts to some 15-20 per cent of total production. According to tentative estimates made by Dubgaard, if nitrogen use was reduced by one-third and pesticide use by a half, crop production would be likely to fall by approximately 10-15 per cent. A reduction in nitrogen use of about one third could be achieved either by reducing crop prices by 50 per cent or by imposing a nitrogen tax of 150 per cent. The effects of these two policies on farm income would, however, be very different. Calculations for Denmark showed that, whereas reducing crop prices by 50 per cent would have resulted in a loss of income of between 370 and 700 ECU per hectare (ECU/ha) for cereals, the imposition of a 150 per cent nitrogen tax would have led to a loss of between 68 and 115 ECU/ha. These findings are borne out by German economists who calculate that a halving of the price of cereals would make their production uneconomic on even the best land in Germany, while a doubling of the nitrogen price would still allow economic cereal production on the good sites.⁹

The reason for the different effects of price reduction and increased nitrogen prices on farm incomes is related to changes in the ratio of nitrogen to output costs. A reduction in price does not alter the costs of production (such as labour, machinery, fertilizers and loan servicing) relative to each other; but it does mean that if a serious decline in farm income is to be avoided, either the costs must be reduced by cutting back on the use of loans, labour, machinery or fertilizer; or else output must be increased by purchasing more land or intensifying production. The correct strategy for survival will vary from farm to farm. The likely result of restructuring driven by price reductions is the abandonment of farming activities in marginal areas, and the intensification of production in favourable areas, both of which involve significant social and environmental costs.

Under the nitrogen tax scenario, the higher cost of one input, nitrogen, in relation to that of other inputs would force farmers to rethink the mix of inputs used. There would be a definite incentive to reduce nitrogen use, rather than to save on labour or machinery costs. Von Urff illustrates the principle with a statistical example:

“With a wheat price of 0.30 Deutschemark per kilogramme (DM/kg) and a nitrogen price of 1.50, the ratio between the two prices is 1:5. It would be possible to neutralize the direct income effect caused by a doubling of the nitrogen price (to 3.00DM/kg) by a 10% increase in the price of wheat (to 0.33DM/kg). The ratio between the two prices would thus have changed to 1:9.09, a change that would provide an incentive to reduce nitrogen fertilization.”¹⁰

Compensating for Farm Income Losses

Under a system of eco-taxes, farmers would either have higher costs due to the taxes placed on nitrogen and other inputs, or lose income due to the reduced yields associated with using less



A fertilizer sack sinking into a mire of muck and straw. The use of artificial fertilizers has turned manure from a vital by-product into a disposal problem.

nitrogen. In theory, the effect on farm income of increasing the cost of nitrogen could be neutralized by a small increase in commodity price, without eliminating the effect that a nitrogen tax would have on surplus reduction. According to Dubgaard, for instance, the effect of reducing nitrogen use by 25-30 per cent through a substantial taxation on nitrogen would be to reduce income per hectare by 10 per cent. Such an income loss could be offset by raising crop prices by 5 per cent, so that in Dubgaard's words “the environmental effects of price support (on the intensity of fertilizer and pesticides) can be eliminated through eco-taxes — without neutralizing the income effects of price support.”¹¹

Other economists, such as von Urff, while agreeing that this is an attractive proposition in theory, argue that in practice the solution would not be quite so neat. According to von Urff, the degree of price compensation which would be needed to offset a particular size of nitrogen tax would vary from site to site, and presumably also from region to region. As it is impracticable to vary either taxes or prices according to site, some farmers would be considerably overcompensated, whilst others would be undercompensated. Additionally, since nitrogen taxes would affect all crops, not just cereals, adjustments would need to be made to many different prices, and failure to keep prices in line with each other might trigger large-scale changes in cropping patterns.

As an alternative to raising prices to maintain farm incomes, a number of other schemes have been suggested. These range from the reimbursement of a set amount per hectare, or per

farmer, through to making direct payments for specific types of environmental goods, or for the adoption of certain farming practices. While reimbursement of a standard amount per hectare has the attraction of being administratively cheap and simple, it would also, like the raising of prices, overcompensate some and undercompensate others. In this case, though, it would be likely to overcompensate those in disadvantaged regions, where little nitrogen was used, and undercompensate those on good land who were using more than average amounts of nitrogen.¹² Although this has some attractions in terms of providing assistance in areas where farming is most difficult, per-hectare compensation would continue to direct the majority of support to the biggest landholders regardless of the farming practices employed.

A variation on this scheme, which has a stronger environmental component, would be to impose taxes only on purchases of nitrogen fertilizer which exceeded a basic quantity (in the range of 80-120 kilogrammes of nitrogen per hectare). This scheme, though more administratively complex than providing a flat rate payment per hectare, could be achieved by imposing a tax on all nitrogen as it left the factory, but allowing farmers to claim back the tax on a certain amount of nitrogen per hectare. It has the advantage that it would provide a strong incentive for farmers to keep below certain levels of nitrogen usage. In practice, however, it would be almost impossible to stop farmers from applying all their artificial nitrogen to particular areas and crops, perhaps keeping some very poor land unfertilized, while growing intensively on the best land.

No system of payments is going to be foolproof in its application. But it is also desirable to use revenue raised from nitrogen and other taxes to further social and environmental objectives. In fact, it is the package of policies designed to redistribute the revenue derived from taxes, as much as the taxation policy itself, which would affect the kinds of practice which farmers found it economic to adopt. There is no reason why the revenue raised should not be paid out to farmers for the appropriate management of specific environmental features, such as hedgerows or wild flower meadows, or for the adoption of organic farming or other practices which are regarded as being environmentally or socially beneficial. In reality there is no single right answer. The schemes devised to redistribute the revenue would inevitably reflect environmental, social and political priorities, and would therefore vary from region to region, or from nation to nation, both within the EC and outside it.

Eco-Taxes versus Nitrogen Quotas

The problem of taxation and redistribution of revenue is one of the reasons why some people have argued for nitrogen limitation policies to be implemented through quotas, rather than taxes. The EC at least has some experience of quotas, though output rather than input ones, and arguably quotas that were tradeable would enable farmers to choose the right mix of inputs for their enterprises. If nitrogen quotas were allocated to all farms on some kind of weighted per-hectare basis, then those not wishing to use artificial nitrogen, such as organic farmers, would at least benefit from their sale. However, in Britain at least, it is the large cereal farmers who would be most disadvantaged by this form of quota distribution and there would therefore be intense lobbying to make quota distribution reflect current usage. Yet distribution according to current usage would

further disadvantage small farmers and those on marginal land, and reward those who had intensified. If quotas were tradeable, it is likely that most of the quotas, and hence nitrogen use, would be concentrated in areas such as the East of England, where intensive cereal growing is profitable and mineral nitrogen use has already caused significant groundwater pollution.

Mineral Nitrogen versus Animal Manure

The other major concern about eco-taxes is that they target mineral nitrogen, when arguably many of the problems, certainly in Europe, are caused by manures which result from the concentration of intensive animal production in certain areas. In The Netherlands, for instance, pig production has tended to move off farms to intensive units near the ports, in order to be near the source of imported feed, coming predominantly from Brazil and South-East Asia. The concentration of animal production in The Netherlands is now such that there is a 40 million tonne mountain of manure — twice as much as can be used safely on Dutch farmland.¹³

Some people have put forward the idea that nitrogen balance sheets should be worked out for each farm, and that only if there is a great loss of nitrogen in the system (implying a pollution problem) should the farmer be penalized. Although this system has its attractions, it would be extremely difficult to implement in any country in which farms were not run as "high-tech" business operations, with access to computers and fairly sophisticated input/output analysis. It also concentrates on solving immediate environmental problems, rather than on addressing the underlying problem of intensity.

Critics of the use of nitrogen taxation as a supply control measure argue that the substitution of animal manure for artificial nitrogen would mean that output would not necessarily reduce as much as was expected, especially in the short-term. However, the raising of nitrogen prices would make it more economic to return to the use of manure as an integral part of the farming system. Many environmentalists and animal welfare campaigners would welcome a shift away from specialist intensive arable and livestock production towards mixed farming. A nitrogen tax on its own might not discourage intensive animal production, but it would be perfectly possible to combine eco-taxes with stronger animal welfare legislation in such a way as to tip the balance towards more extensive systems of animal production. Environmental damage caused by the use of manure could be reduced by research and advice on the best ways of storing and handling it.

Eco-taxes: Food for Thought

Critics of large surplus reducing eco-taxes argue that we have no idea what effects they would have. For instance, it is not clear whether a large tax on nitrogen would lead to a substantial shift in the types of crops grown: for example, from oilseed rape towards grain legumes as a break crop.¹⁴ Such shifts might, or might not, be desirable in environmental and economic terms, depending on the practices employed by farmers. Some economists also argue that high taxes would lead to an inefficient allocation of resources, and point out that it is not necessary to impose a uniform and severe cut-back on nitrogen use throughout a region, as in environmental terms some areas are much

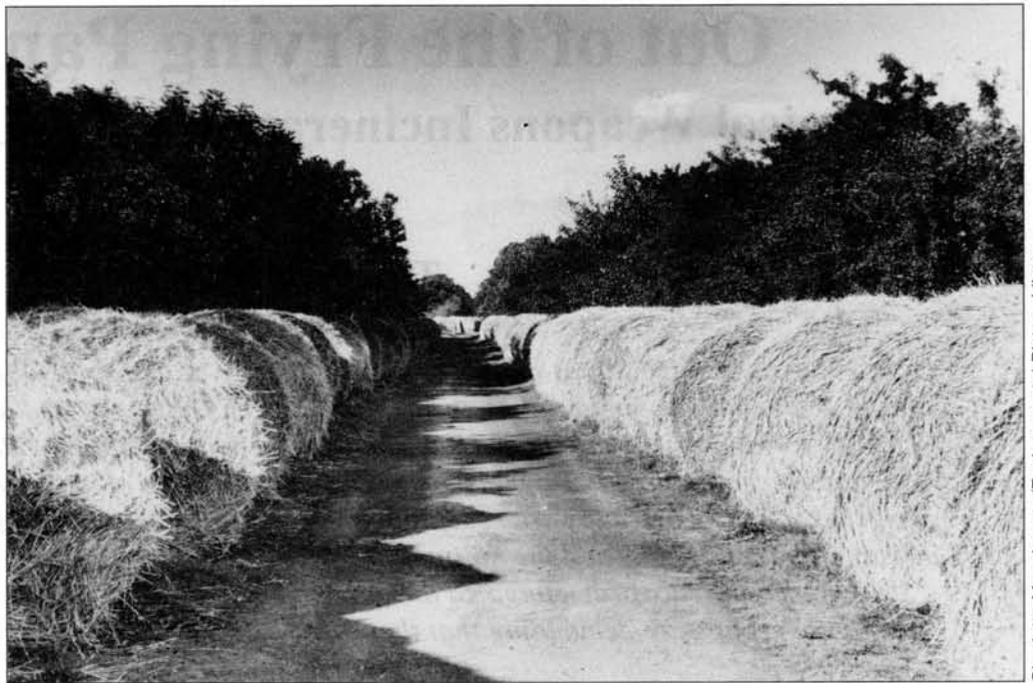
more vulnerable than others.¹⁵

Seen in straight supply control terms, eco-taxes may seem a rather unwieldy solution, possibly triggering large shifts from one crop to another, and almost certainly making agricultural commodities more expensive. Seen as an approach to protecting the environment, eco-taxes might appear to be a blunt instrument, with many unknown side-effects. But they do offer a way of tackling the underlying problems of intensification through a restructuring of agriculture, rather than merely tackling the symptoms of the present unsustainable system. The real issue is not so much whether eco-taxes make sense in terms of solving specific problems, but whether they provide the right long-term signals for farmers, and the right framework for the development of more sustainable farming practices.

Nitrogen taxes could be part of a useful package which shifted agriculture away from intensive chemical agriculture, lessening potential environmental damage, without inflicting too much harm on farmers. There would be an incentive for farmers to return to mixed farming, with a greater reliance on nutrient cycling and non-chemical methods of pest and weed control. Many environmental problems, in Europe at least, stem from the concentration of certain kinds of production, such as animal rearing or arable crop production, in particular regions, and any policy which counteracts this tendency towards over-specialization should be seen as moving agriculture onto a more environmentally friendly path.

This wider perspective has been sadly lacking in policy-making circles, both within the EC and the US, where successive policies have lurched from one stop-gap measure to the next. Over-specialization is precisely the direction promoted by GATT and the European single market. Much of the opposition to nitrogen taxes is rooted in the fact that any policy which imposes high taxes on inputs would be incompatible with a free trade policy. Unless taxes were imposed across the board, farmers being taxed would suffer an immediate disadvantage, and would need protection from unfair competition.¹⁶

If calls for more sustainable and environmentally friendly agriculture are to be taken seriously, an effort needs to be made to outline the policies which will help farmers shift themselves off the chemical treadmill without decimating both the farming population and rural communities. Eco-taxes have the potential to shift the balance in favour of less intensive farming methods, encouraging indirectly the better use of manures, giving a boost to those already farming in an environmentally friendly way and helping to reduce the problem of surplus production. If farmers are to shift off their collision course with environmentalists and taxpayers, serious attention needs to be directed towards restructuring the policy framework within which they are forced to operate. In this context, eco-taxes provide a vital starting



One of the many artificial hedgerows of straw that now adorn the British countryside. The traditional relationship between straw and manure was symbiotic: straw soaks up manure, while manure provides the nitrogen which helps straw decompose. Now, with increased specialization and use of chemical fertilizers, both straw and manure are surplus to requirements.

point for an examination of the objectives and costs of a new agricultural and environmental policy.

This article has drawn heavily on a conference held at the University of Hohenheim, Stuttgart, Germany, on June 15-17, 1992, addressing the question "Can Eco-Taxes Solve the EC Agricultural Crisis?" In particular, use has been made of the unpublished papers, cited below, by Tony Ashford, Alex Dubgaard, John Marsh and Winfried von Urff. The author is grateful to Rudolf Buntzel and Rolf Werner for organizing the conference and making the papers referred to above available in English. The Conference proceedings are published in German by Agrarsoziale Gesellschaft, Postfach 667, D-34 Göttingen, price 20,-DM.

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Out of the Frying Pan . . .

Chemical Weapons Incineration in the United States

by

Triana Silton

In 1982, the United States military opted to dispose of its rapidly decaying stockpile of chemical weapons by incinerating them. Many citizens have rejected incineration, however, because of its serious health and environmental effects; a nationwide network of citizen groups recently forced Congress to stop or delay funding of incineration at most of the targeted sites. Such groups are redefining the political arena in which decisions are made, insisting that politicians and the military are accountable to those whose "national security" they are supposedly protecting. No one doubts that the weapons must be dismantled: but citizens' groups are demanding that they have a decisive voice in determining how such disposal takes place.

Between 1943 and 1969 — when the United States declared an 18 year moratorium on unitary¹ weapons production — the US military manufactured an arsenal of chemical weapons that it claimed would deter its enemies, portrayed as ruthless enough to use chemical weapons themselves, from engaging in warfare with the US. By 1992, the United States stockpile of chemical munitions stood at 30,000 tons, composed of organophosphorous nerve agents (GA-tabun, GB-sarin, GD-soman and VX) and vesicants (blister gas), mainly mustard gas.² The nerve agents are odourless, colourless and tasteless; in small doses they cause a lack of muscular coordination followed by paralysis, vomiting, diarrhoea and mental aberrations, while larger doses are fatal. GB vaporizes instantly when exposed to air while VX remains a liquid and is potent for several days. Exposure to gaseous vesicants causes severe skin blisters, injuries to the eyes and damage to the respiratory tract, and at high concentrations can be fatal.

Captured Second World War munitions and weapons which were no longer functional have been exploded, burnt, buried and dumped at sea for nearly five decades.³ Public pressure, however, has had a consistent influence on disposal methods. Concern about the hazards of land disposal led the army to pursue Operation CHASE ("Cut Holes And Sink 'Em") from the 1940s to the 1960s, loading old munitions onto Second World War Liberty ships and sinking them in ocean trenches on the Continental Shelf. Public outrage at using the ocean as a dumping ground, however, forced Congress in 1969 to ban ocean disposal.⁴ Under growing international and national pressure to deal with leaking munitions and faced with growing problems over the storage, transportation, maintenance and disposal of its unitary chemical weapons, the Pentagon decided to test chemical neutralization and incineration as "alternative" disposal options. Between 1972 and 1976, using chemical solutions, the army neutralized 4,000 tons of GB at the Rocky Mountains Arsenal in Colorado, creating supposedly harmless salts. Because the military considered the costs of dumping

these salts, which contained traces of nerve agent, to be too high, chemical neutralization was rejected.⁵ To test incineration, a pilot Chemical Agent Munitions Disposal System facility was built at Tooele, Utah,⁶ which went on-line in 1979. Flying in the face of evidence to the contrary, the army decided that incineration was efficient, cost-effective, easy and safe, and in 1982 chose it for its Chemical Stockpile Disposal Program.

In a 1985 "compromise" deal proposed by the military, Congress agreed to fund the manufacture of binary chemical weapons if the military would dispose of 90 per cent of its unitary weapons stockpile by 1994. This was despite grave and long-held doubts about binary weapons, but Congress was under public pressure to clean-up the unitary chemical munitions, although not to stop weapons production.⁷

The first incinerator facility, the Johnston Atoll Chemical Agent Disposal System (JACADS), went on-line in 1990 at Kalama Island in the South Pacific,⁸ disposing of US weapons from Germany and Japanese weapons. Construction of incinerators was to follow at the eight sites on the US mainland where the chemical weapons are stockpiled: Anniston, Alabama; Aberdeen, Maryland; Newport, Indiana; Umatilla, Oregon; Pine Bluff, Arkansas; Richmond, Kentucky; Pueblo, Colorado and Tooele, Utah, where a new incinerator had to be built as the pilot facility was inadequate for the quantity of weapons — 42 per cent of the national stockpile — stored there.

Going up in Smoke

Despite army safety assurances, incineration, particularly of nerve agents and blister gas, is not without dangers. These stem, on the one hand, from the various hazardous substances released into the air during incineration and, on the other, from the toxic ash which remains after the burn, problems which are exacerbated by careless management and poor training of personnel.

Incineration releases into the air unburned chemical agents, heavy metals and particles of incomplete combustion (PICs), even when the facility is operating at efficiency standards higher than those set by the US Environmental Protection

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Agency (EPA).⁹ PICs, such as dioxins and furans, produced in the incineration process can be more hazardous than the waste being destroyed. Highly-toxic dioxins have been found downwind of virtually all incinerators. An established carcinogen, dioxins are also implicated in immunological, developmental and reproductive effects.¹⁰ Additional hazards are created through the bioaccumulation of PICs and of heavy metals and toxic organic contaminants released into the air or leftover ash where they are concentrated in solid form.¹¹ At Kalama Island, elemental mercury released from the facility has been converted by microbes into the more dangerous methyl mercury which bioaccumulates.¹²

The hazardous scrubber brines, bottom ash and fly ash left behind all have to be disposed of in landfills, the hazards of which are now well-known.¹³ As William Ruckelshaus, the first director of the EPA, admitted in 1989, "Of course all landfills will leak." The ash and leachate (the liquid which accumulates at the bottom of a landfill) poisons the surrounding soil and contaminates the underground aquifer.

Operating Problems

All these dangers are in part due to the fact that incinerators rarely, if ever, operate optimally. The temperature of the combustion chamber, the amount of time the waste is in the chamber and the mix of air and waste are critical determinants of complete incineration. Disruption of any one of these factors causes incomplete combustion and can lead to the release of quantities of unburned waste and PICs. If the waste — the chemical agent and other parts of the munitions — is not fed continuously into the combustion chamber, incineration is disrupted.¹⁴ Such a continuous feed, however, can never be guaranteed.¹⁵ At Kalama Island, for example, engineering and design faults regularly cause the conveyor belts to malfunction, interrupting the waste feed and leading to release of the deadly agent. When the facility was burning the nerve agent GB,¹⁶ the active agent was detected on 32 occasions in the corridors, on 15 occasions in the life support air systems, and on five occasions at the perimeter (although these were possibly "false positives", indicating faults in the detection system). The pilot facility at Tooele, Utah has a similar history of accidental releases: in May 1986 a clogged drain caused chemical agent to overflow onto the floor inside the incinerator; in 1987 nerve agent escaped into a work area.¹⁷ Officials eventually admitted to six releases of agent into the atmosphere after workers leaked information to the press and after pressure from concerned citizens who had used the Freedom of Information Act to gain access to government documents detailing the releases.



Incineration of chemical weapons, created to "protect" the citizens of the United States, will bring chemical warfare to those communities where the weapons are stockpiled. In cases of war, soldiers are protected by gas masks — but in the event of an accident at an incinerator, there are no gas masks or protective clothing for local people while nothing can be done to protect the environment.

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A shortage of staff and a high rate of staff turnover at incinerator facilities only exacerbate the risk of accidents. A subsidiary of a long-standing defence contractor, Raytheon, in charge of the Kalama Island facility, never has a full complement of management, control room operators and maintenance workers to run the incinerator. Few people are willing to move to a remote Pacific island where "the first thing that happens when you arrive . . . is you get your protective mask."¹⁸ During 1989, staff turnover at JACADS was 29 per cent and the rate has been as high as 45 per cent. For almost two years, the overall manager of the facility had neither an engineering degree nor previous experience in starting up an industrial plant.¹⁹

Should a major accident occur, the results could be devastating. An explosion, even in a "state of the art" incinerator burning nerve agent would not only contaminate the surrounding soil and water, but would also poison or kill surrounding plant and animal life and people. The incinerator proposed for Anniston, Alabama would put 60,000 people at risk over an 18 mile area, a large part of which is urban. Brenda Lindell, a member of Families Concerned About Nerve Gas Incineration in Anniston, said "We're in the kill zone."

Potential disasters are magnified by poor contingency plans. An exercise in June 1991 in Tooele, Utah demonstrated the inadequacy of the Chemical Stockpile Emergency Preparedness Program and the military's incompetence: evacuees were given no directions, so could have walked straight into a plume of nerve agent; no decontamination zone was marked at the local hospital, leaving those who had been "exposed" contaminating the ground outside the hospital; environmental laws were broken; and substantial delays occurred in hospital provision of emergency services.

More alarming, however, is the actual procedure carried out during a July 1992 accidental release of mustard gas at the same

site. The contact safety officer was unavailable — his answering machine had been switched on and there was no one else to contact — night-shift workers upwind of the release were not alerted and were confounded by the locked gate preventing them from leaving the site when their shift was over. Although no one was immediately hurt by the small release, Steve Erickson from Downwinders, a group opposing the incinerator, points out that, “the potential consequences are too disastrous to contemplate.”

Military-Industrial Links

The reasons given by the army for choosing incineration to destroy the chemical weapons stockpile — safety, efficiency and cost effectiveness — have all been disproven by the facilities in Tooele and on Kalama Island, and, indeed, by the record of civilian hazardous waste incinerators.²⁰ Once a decision is made, however, the army bureaucracy does not question its orders. When citizens from designated incinerator sites stated clearly in meetings in 1990 and 1991 with military bureaucrats that they would oppose incineration, the army reported back to Congress that there were no concerns about incineration *per se*, simply “minor obstacles” which had to be overcome. As Craig Williams of the

Kentucky Environmental Foundation points out, “It soon became clear that our words were getting twisted and that using [the army’s] internal mechanisms was a waste of time.”

The military does, however, have objectives of its own in pursuing incineration. These include: dealing with its enormous hazardous waste problem; maintaining cooperation with defence contractors while funding for production of weapons systems is reduced and that for clean-up increased; and extending its contacts with the private industrial sector, particularly the waste disposal industry. Waste disposal is lucrative for the military, defence contractors and waste disposal firms.

The military produces well over one ton of toxic waste per minute, possibly more than the top five US chemical companies combined,²¹ a problem compounded, until recently, by military exemption from environmental legislation. The US military’s toxic legacy includes the complete range of toxics found in civilian hazardous waste — paint thinners, solvents, aviation jet fuel and batteries — with the addition of wastes specific to the military, such as radioactive liquid wastes and unexploded munitions. As of 1990, the military had found 17,821 potentially contaminated sites at 1,855 military installations across the country. It rivals the Environmental Protection Agency in the number of active environmental workers it employs, and spent well over \$600 million on cleaning up in 1990 alone.²²

Defence contractors are often hired by the military to clean up, even when they created the problem in the first place.²³ For

example, during decades of military contracts, Hughes Aircraft Corporation illegally dumped trichloroethylene (TCE), a highly carcinogenic substance, and other toxic wastes into the Arizona desert, contaminating the groundwater used by over 47,000 people. The US Air Force, however, contracted Hughes back to clean up the water a few years ago. “Rather than hold the company liable for its pollution, we’re going to pay them, plus a profit, to clean it up,” said Congressperson Mike Synar.²⁴

The corruption between the military and the waste disposal industry mirrors the well-documented collusion between the military and defence contractors. Inaccurate budget estimates for weapons systems are paralleled by those for waste disposal. The plans to incinerate chemical weapons have consistently overrun time and budget estimates, delays which do not lead to better disposal, but to a continuous allocation by Congress of funds to the military and their contractors. Cost overruns and technical difficulties have already led to the 1994 completion

deadline being put back to July 1999.²⁵ The 1985 initial estimate for the entire chemical demilitarization programme was \$1.7 billion, but by 1992 it had risen to almost \$9 billion.²⁶

The 1982 Congressional approval of incineration of the chemical weapons stockpile forbids any other use of the facilities. But as Congress faces a large budget deficit and as the severity of the military’s toxic legacy becomes clear, it seems unlikely that it will spend

\$9 billion on incinerators, only to dismantle them, once the chemical weapons have been destroyed, especially as some of the eight chemical weapons sites are contaminated from other military activities. In the Committee Report for the 1992 Department of Defense Appropriations Bill, Congress directs the army to provide, “an updated assessment regarding the future use of the chemical demilitarization facilities and when modifications to the facilities or to current law would be needed in order to accommodate follow-on uses.” An independent study commissioned by the army reported that, without major alterations or financial outlays, other wastes besides chemical weapons could be disposed of in the incinerators. The National Research Council and the General Accounting Office have all suggested that the facilities be converted for long-term hazardous waste disposal.

Citizen Resistance

The military’s lack of consideration of public safety and environmental issues in its plans to dispose of chemical weapons has generated a movement of citizens groups across the United States opposing incineration. Over the past two years, as the Kalama Island facility has gone on-line and the deadline has approached to site, construct and start operating the mainland incinerators, the very different communities at the eight tar-



Kentucky Environmental Foundation

As citizen groups have battled against the proposed chemical weapons incinerators, they have become involved in other waste disposal struggles across the country. “Not In My Back Yard” has become “Not in Anyone’s Back Yard” — and, increasingly, “Not on Planet Earth”.

geted sites have organized and informed themselves, and joined together to voice concerns which the military has consistently ignored — the safety of the surrounding community and environment and complete disposal of the weapons. To determine what is safe, communities are demanding to be included in making decisions about methods of disposal. Even the 1992 Senate Defense Authorizations Act commented that “The Chemical Demilitarization programme has been repeatedly criticized for not providing for public input and involvement. Many of the problems resulting in cost overruns and schedule growth have their roots in the lack of public participation.”

In most communities, resistance started with one or two people finding out about proposed incineration of the stockpile near their town and telling others. In Anniston, Alabama, for example, Brenda Lindell — who describes her reaction to learning about the incinerator as being like “a mother bear going out to protect my young, and nothing was going to stop me” — was joined by three or four other concerned people who felt incineration was a threat to their health and safety. Each of them decided to talk to 20 people about the plans and meet again the following week. They formed a group, Families Care About Nerve Gas Incineration, which contacted citizen-based toxics organizations and environmental groups for details about civilian hazardous waste incineration and related issues, information that was key to citizen resistance. Although Anniston’s main source of income is the military, resistance to the proposed incinerator has grown rapidly since May 1992 when the local group started to publicize its dangers.

In Aberdeen, Maryland, the Coalition for the Safe Disposal of Chemical Weapons set up a speaker’s bureau which sent speakers to schools, rotary clubs, private clubs and business associations to talk about the proposed incinerator. The Coalition collected 7,000 signatures from a county of only 13,000 people to its petition indicating concern over the incinerator. Although Aberdeen has only a small percentage of the national stockpile of chemical weapons, the state’s existing high cancer rate would be exacerbated by incineration.

Legislation

Communities have demanded that the military abide by existing law, and have lobbied state and national legislatures for new laws prohibiting incineration. The Sangre de Cristo group opposing the incinerator in Pueblo, Colorado pointed out to the Colorado Health Department that the army had violated national environment law as it had applied for a permit for an incineration facility before completing an environmental impact statement. The group’s action halted construction in Colorado for several months, but in October 1992, the Department of Health withdrew its objections and the army is planning to proceed.

In Richmond, Kentucky and Newport, Indiana, citizen groups helped draw up state legislation which significantly delayed incineration plans. The Kentucky law prohibits incineration unless the army can prove that no alternative “is likely to exist or could be developed” before the obsolete weapons become too unstable to store.²⁷ It also requires health studies to be carried out to ensure people in the area would not be affected by incineration, studies which the national Center for Disease Control estimates would take approximately 30 years to complete. A similar law was passed in Indiana.

Such efforts to create legislation at a state level have led to

legislative moves on a national level. Bob Hukill from Aberdeen’s Coalition for the Safe Disposal of Chemical Weapons was instrumental in getting the group to lobby Congress. Forty-five people took a bus to Washington, DC to speak with their own national representatives and key Congressional players, such as members of the Armed Forces Committee and the Committee on Appropriations.

Discredit and Divide

Unsurprisingly, there have been attempts to discredit or split communities. In Anniston, Alabama, the press (which is tied to the military) tried to discredit Families Care About Nerve Gas Incineration by portraying it as a group of “radicals, johnny-come-lately environmentalists and imports” from other communities, such as hippies from California. To counter these claims, the group gathered over 5,000 signatures to a petition indicating that a large part of the community was concerned with the potential for disaster if incineration went ahead.

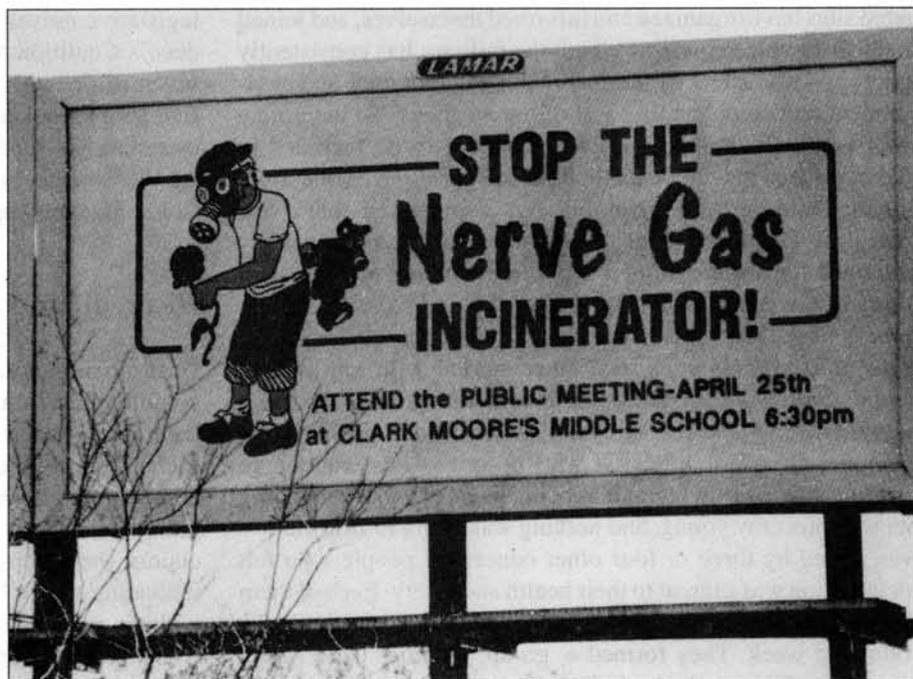
In Pueblo, Colorado, the army has tried to break the community apart by wooing certain people over to its side. While Ross Vincent of the Sangre de Cristo group and a number of people from the area were barred from the military’s initial review process, the military made a special effort to persuade local business people and local government of the advantages of incineration. “The army was interested in input as long as it controlled who, how and what information the people had access to,” says Vincent. In November 1992, however, after the potential problems of incineration were impressed upon federal and state representatives and local business leaders at a public meeting by two active campaigners against chemical weapons incineration, these public officials formed another local group against the incinerator. Despite the October 1992 green light, renewed resistance in Colorado makes Craig Williams of the Kentucky Environmental Foundation optimistic: “I don’t think they will wind up building the incinerator there.”

Redefining the Expert

To insert their concerns into political decisions, the citizen groups opposing incineration have tried to redefine the “political” arena, so that politicians and the military are accountable to those whose “national security” they are supposedly protecting. As Penny Newman, organizer for the Citizen’s Clearinghouse for Hazardous Waste, says “We just have to take it out of their ball park, define our own rules and make them play by them.”

An important part of this redefining has been to challenge who the experts are and what they are expert on. Incineration experts are not experts on the technology’s impact on a specific community, particularly its health effects. Whereas Raymond “Pete” Ross, mayor of a town near Pine Bluff, Arkansas, said to the local opposition, “I can’t understand where you are coming from, I trust the experts to protect the citizens,”²⁸ Angela Dooley from Common Ground, the local community group opposing the incinerator, thinks otherwise. She says that in the past, “experts” have assured her that industries polluting her surroundings would have no health impact, but her own experiences and knowledge of the community clearly indicate the contrary. She believes that incineration can only magnify existing health problems in the community, so she refuses to accept the

Public meetings serve as a forum for citizens to set their own agenda, while challenging the "expertise" of the military and demanding its accountability. People quickly realize that when it comes to knowing what is best for the community, they are the experts. Gaining in confidence as campaigns evolve, communities have become strong enough to withstand attempts by the authorities to split them. The issues they are now addressing extend beyond the disposal of today's military hardware: citizens are demanding that the military must not produce weapons it does not know how to dispose of safely.



Richmond (Kentucky), Register

advice of the "experts". As malnutrition and the polluting industries in Pine Bluff make the people and the ecosystem especially susceptible to more toxics, Dooley says, "It only hurts us worse because we're already poor, I just don't see adding to it."²⁹ As people have taken science into their hands, they have realized that the "experts" contracted by the government and the army have particular goals which colour their "neutral" science and which prevent them from recognizing or acknowledging environmental and health effects which might stand in the way of attaining those goals.

Connection to Broader Movements

As citizen groups around the eight sites have battled against proposed chemical weapons incineration, they have also learned about other incinerator and hazardous waste disposal struggles across the country. The grassroots toxics movement is composed of predominantly African-American, Asian-American, Native American, Pacific Islander, Latino and poor white communities which are hardest hit by hazardous and solid waste disposal.³⁰

For instance, the ash from the proposed Anniston, Alabama incinerator would be transported to Emelle in the same state, the largest hazardous waste landfill in the world which is run by Chemical Waste Management. One-third of the county's residents live below the poverty line,³¹ and 90 per cent of residents near the landfill are African-American. For Brenda Lindell, it was only through struggling against chemical weapons incineration in Anniston that she learned of the problems at Emelle.³² "I hope people don't become complacent . . . even after we beat the incinerator," Lindell remarked.

Chemical weapons groups have actively supported some of these other struggles. For example, in August 1992, Craig Williams of the Kentucky Environmental Foundation asked the various chemical weapons groups to support residents of Liverpool, Ohio, who had started a hunger strike in protest at a hazardous waste incinerator about to go on-line in their town, by writing and telephoning the EPA to protest. Such combined

pressure from citizens across the country recently stopped this incinerator from starting up. Moving from NIMBY to NOPE — "Not In My Back Yard", "Not In Anyone's Back Yard", "Not On Planet Earth" — the movement of those resisting chemical weapons have linked individual health with that of their neighbours to that of the planet as a whole.

Building a Movement

This localized community opposition has gradually developed into a nationwide movement against chemical weapons incineration, particularly in the past year. Towards the end of 1990, the Department of Defense held a meeting to discuss chemical weapons incineration which several people from some of the mainland sites decided to attend. Irrespective of the military's agenda, they concluded that community representatives from all eight sites should begin coordinated discussions among themselves to share information on the stockpiled weapons, incineration and alternatives and to compare opposition strategies.

One year later in November 1991, Craig Williams of the Kentucky Environmental Foundation organized a conference for key people from all eight domestic facilities, as well as from Hawaii, the base of resistance to the Kalama Island facility, and Russia. Meeting face-to-face personalized the sites for everyone. It made Tooele, Utah, more than a spot on the map; it gave it and its community a name, a face and a story of resistance, thereby making it more difficult for other communities to say "Send it to Utah" when opposing incineration of the stockpile near their own town.

In just three days, the gathering drew up the International Citizens' Accord on Chemical Weapons Disposal. This called for an immediate halt to all chemical weapons incineration and to any proposals for other open-ended systems; for the 1990 US-Soviet Union Chemical Weapons Agreement and all future agreements to separate the timetable for disposal from that for demilitarization;³³ and for the army to commission site-specific studies including environmental impact statements. It stated

clearly that "In negotiating international chemical weapons agreements, the impact on people and communities must be a central concern."³⁴

Congressional Lobbying Pays Off

After this meeting, communities at each of the sites, as part of the newly-formed Working Group on Chemical Weapons, continued to lobby Congress. Their persistence has recently led to legislation which, if enforced, begins to put an end to incineration at six of the eight sites. The 1993 Defense Authorization Act and Defense Appropriations Bill include seven sections, paraphrased from the Citizens' Accord, which halt 1993 funding for the three low inventory sites — Kentucky, Indiana and Maryland — and postpone funding for those at Alabama, Arkansas and Oregon. The sites at Utah and Colorado were exempted from the new legislation, Utah because 65 per cent of the incinerator is built and Colorado because it is the test site for the cryofracture technique — freezing the weapons before burning them — which the army maintains is qualitatively different from incineration.

The impact of the Working Group is being heralded in Washington as "extraordinary" and "exceptional"; from the group's perspective, this progress is "extremely empowering" says Craig Williams. Angela Dooley says she is hopeful, but believes it is still important to ensure this new legislation is implemented and that construction of an incinerator does not even begin. The army, on the other hand, has been left floundering for a disposal option.

Alternatives

There is consensus among groups from all eight sites with the military that the chemical weapons need to be dismantled, a need clearly stated in the Citizens' Accord. Safe long-term storage is simply not a viable option for chemical weapons because they gradually decay and leak. But they can be dismantled and the constituents stored for longer without posing threats to health or the environment, until a safe disposal method is found.

In 1991, in a document of 200 pages, Greenpeace detailed a broad range of alternative technologies that could be employed to destroy chemical weapons. In the process of chemical degradation, chemicals break down the nerve agents or vesicants in the weapons, creating neutralized salts; micro-organisms used in biodegradation can break down the agents or the potentially-harmful traces left in chemically-neutralized salts. The photodegradation technique uses light to speed up natural degradation, sometimes in combination with various catalyst chemicals, while electrochemical degradation uses energy.

A key issue concerning the destruction of chemical weapons, however, is not only to consider the effectiveness of a technology but also to change the whole process by which a technology is, at present, chosen. Those most likely to be affected by disposal have to participate in deciding whether a certain technology is safe to be applied at a particular site. No longer can the technology be considered simply as pure science where "experts" assess its applicability, without taking into account the unique ecology of the region and the unique community which would be affected. No longer can the experts or the military be the only ones to decide.

The racism involved in choosing Kalama as the first site for chemical weapons incineration is clear to local islanders. "Why bring the chemicals out to our front yard in the Pacific? You know why? Because they don't class us as human beings. They class us as breadfruit, as coconuts and guava, tapiocas and taros."

This aspect of the debate is now especially pertinent. After nearly three decades of negotiations, an international Chemical Weapons Convention is now awaiting United Nations approval and may come into effect as soon as 1994, replacing the 1925 Geneva Protocol on the use of chemical weapons.³⁵ The Convention prohibits development, production, stockpiling, transfer, acquisition and use of chemical weapons, and stipulates that disposal of all weapons and materials used in their construction should begin as soon as the Convention comes into effect. Within ten years of ratification, all obsolete chemical weapons and a number of other items, such as chemical precursors and any ingredient which could be used to build chemical weapons, would also have to be disposed of.³⁶ The Convention would expand the list of sites the US military's chemical weapons programme would have to contend with to over 200.

As negotiators have already pointed out, however, there will be problems, not just in monitoring the Convention, but even in carrying it out — how are chemical weapons to be disposed of safely? The challenge now is for communities at all sites connected with chemical weapons to ensure that they are involved in choosing the appropriate technology to do so.

For more information on chemical weapons incineration, contact: Citizens Working Group on Chemical Weapons, c/o Craig Williams, Kentucky Environmental Foundation, PO Box 467, Berea, KY 40403, USA; Tel: +1 (606) 986 7565; Fax: +1 (606) 986 2695.

Notes and References

1. In a unitary chemical weapon, one highly toxic chemical substance is stored in active form in one part of the weapon. A binary weapon stores two inactive ingredients in separate compartments which, when the weapon is launched, react together to produce a highly toxic chemical agent.
2. As of 1988, the unitary weapons arsenal was 7,600 tons of chemical agent in 1.4 million Howitzer shells, bombs, and spray tanks and 4,000 tons of mustard gas in 1.25 million mortar and Howitzer shells, and 13,000 tons of mustard gas, 4,340 tons of GB and 1,860 tons of VX in one-ton storage containers. See Robinson, P. "Review: World Chemical Weapons Armament", *Chemical Weapons Convention Bulletin*, Autumn 1988 p.15.
3. Siegel, L. *Chemical Weapons Disposal: The Threat At Home*, National Toxics Campaign Fund, Boston, Massachusetts, 1991, p.12.
4. Farrell, D. "Ferretting Facts on Chemical Weapons", *Every one's Back Yard* October 1990.
5. Biodegradation of the salts could have neutralized the remaining agent, but this was not tested. The financial costs of disposing of the salts would have been minimal compared to the eventual financial costs of incineration.
6. In the early 1970s, the army burnt 3,000 tons of bulk mustard gas at the Rocky Mountains Arsenal in Colorado, but the incinerator used was not the prototype for the Chemical Agent Munitions Disposal System.
7. In June 1990 President Bush and President Gorbachev signed an agreement pledging to restrict chemical weapons production and to reduce their respective stockpiles by 5,000 tons by 2002, although the agreement allowed for extensions if either country could not meet the deadline. A possible impetus to the US signing of this treaty was increased Israeli concern over Iraqi construction of chemical weapons. In anticipation of ratification and because of continued resistance within Congress, Congress cut off funds for binary weapons production in 1990. This decision was not disputed by the military, however, because it had produced all the binary weapons it wanted. This treaty did not challenge the way in which weapons are to be disposed of.

- The former Soviet Union has yet to decide upon a technology or series of technologies for disposal of its 50,000 tons of chemical weapons. See Siegel, L. op. cit. 3, p.11.
- Kalama Island is the name used by Peoples of the Pacific, while Johnston Atoll is the name designated by the United States.
 - Such releases are likely to have substantial health effects, although at present it is difficult to calculate them because little research has been carried out into long-term exposure to low levels of chemical agents.
 - The EPA's 1992 reassessment of the toxicity of dioxins notes that "Cancer may not be the most sensitive toxic response resulting from dioxin exposure. Immunotoxicity and reproductive effects appear to occur at body burdens that are approximately 100 times lower than those associated with cancer." See *Scientific Reassessment of Dioxin, A Status Briefing for the Deputy Administrator*, US EPA, 1992.
 - Picardi, A. *Greenpeace Review of Johnston Atoll Chemical Agent Disposal System (JACADS) Final Second Supplemental Environmental Impact Statement (June 1990) for the Storage and Ultimate Disposal of the European Chemical Munition Stockpile*, Greenpeace, Washington, DC, 9 July, 1990, p.28.
 - Picardi, A. *Greenpeace Review of Johnston Atoll Chemical Agent Disposal System (JACADS) Draft Second Supplemental Environmental Impact Statement*, Greenpeace, Washington, DC, February 1990, p.26. At Minimata Bay, Japan, methyl mercury which had bioaccumulated in shellfish caused over 200 neurological disorders and 40 cases of cerebral palsy from 1952 onwards after shellfish consumption.
 - As the incinerators are supposed to be dismantled after use, according to a 1982 Congressional mandate, the incinerator itself must also be considered hazardous waste which will have to be disposed of.
 - According to a 1990 inspection survey of 29 civilian hazardous waste incinerators, conducted by the Occupational Safety and Health Administration and the EPA, a significant number of waste feeds in incinerators cutoff automatically. A 1985 EPA report stated that, "Even relatively short-term operation of incinerators in [such] upset conditions can greatly increase the total incinerator-emitted loadings into the environment." In a chemical weapons incinerator, this would mean a greater release of chemical agent.
 - This is partly because of the complexity of the incinerator facility needed to dispose of chemical weapons. For instance, the JACADS incinerator has a remote-control facility which shears the weapons' metal shells and drains their liquid contents, cuts the contaminated metal parts into pieces and incinerates them in one furnace, while the chemical itself goes to another specially-designed kiln to be burned. Yet another furnace destroys workers' protective clothing and less hazardous packaging material.
 - JACADS burned GB until February 1991 when the facility was shut for refit to burn VX.
 - Borys, H. "Chemical Weapons At Tooele: Can Disposal Programs Work Safely", *Deseret Sun*, 1989, p.9.
 - Marilyn Tischbin, the army spokesperson for the JACADS project, cited in Shulman, S. *The Threat at Home: Confronting the Toxic Legacy of the US Military*, Beacon Press, Massachusetts, 1992, p.137.
 - Ibid.*, p.146.
 - Appendix C, *The Track Record of the Hazardous Waste Incineration Industry*, Citizen's Clearinghouse for Hazardous Waste, Falls Church, Virginia, 1987. Civilian hazardous waste incinerators are increasingly mistrusted by citizens, government and even parts of the waste industry, as information about accidents, health effects, cost overruns and other problems has come to light from almost every facility operating. The SCA Chicago Incinerator, one of only three facilities in the United States allowed to burn cancer-causing PCBs, was considered a model facility due to the advanced technology employed, although it too had a history of problems. It was routinely toured by the public, including children and business executives, until February 1991 when an explosion blew off a door and ignited a fire, causing the release of an unknown quantity of hazardous waste into the outside air. The SCA Incinerator is operated by Chemical Waste Management, the hazardous waste division of Waste Management Incorporated which is the world's largest waste hauling and disposal company. See Cray, C. *Waste Management, Inc.: An Encyclopedia of Environmental Crimes and Other Misdeeds*, Third Edition Greenpeace, Washington, DC, 1991, p.25; and Flynn, J. "The Ugly Mess at Waste Management", *Business Week*, 13 April, 1992, pp.76-77.
 - Shulman, S. op. cit. 18, p. xiii.
 - Ibid.*, pp.13,120.
 - Ibid.*, p.144.
 - Ibid.*, p.155.
 - Schneider, K. "Disposal of Chemical Arms Stirs Protest", *The New York Times*, 29 April, 1991; "US Unitary Chemical Weapons Won't Be Destroyed Before July 1999, Army Say", *Inside the Army*, April 29, 1991. p1-2, cited in Siegel, L. op. cit. 3, p.4.
 - Siegel, L. op. cit. 3, p.4.
 - "Army incinerator plan could derail, senior official says", *Lexington Herald Leader*, June 17, 1992.
 - Walters, M. "Chemical Incineration Foes Outnumbered by Backers", *Pine Bluff Commercial*, 20 August, 1992.
 - Clingerman, A. "Arsenal Burn Project Alarms Group", *Pine Bluff Commercial*, 2 August, 1992, p.1.
 - The racism involved in choosing a Pacific island as the first site for chemical weapons incineration is brought out by Secretary-General Henry Naisali from Pacific Forum, a 15-nation grouping of South Pacific governments: "Why bring them to our front yard in the Pacific? You know why? Because they don't class us as human beings in the Pacific. They class us as breadfruit, as coconuts and guava, tapiocas and taros."

- Just as the peoples of the Pacific were chosen to "test" incineration, so too Hispanics are one of the groups exposed to hazardous chemicals in the US. The ash from Kalama Island is shipped to Kettleman City, California to be disposed of in a large landfill run by Chemical Waste Management. The landfill is close to a small, predominantly Hispanic community on which hazardous waste has continuously been dumped because of a belief that poor Hispanics are not able to object. Mary Lou Maya and Espy Maya began "El Pueblo Para El Aire" ("People for the Air") to fight back against a hazardous waste incinerator proposed for their community and to monitor the landfill which was contaminating groundwater and poisoning the air. El Pueblo Para el Aire has said "Basta!, Enough!" See Cray, C. op. cit. 20, p.47.
- The average per capita income was \$9,300 in 1989.
 - Cray, C. op. cit. 20, p.37.
 - Demilitarization should mandate that weapons be dismantled, rendering them ineffective, but not be disposed of until a safe technology has been found.
 - The timing of these two meetings was key. Even though the national Citizens' Clearinghouse on Hazardous Waste organized a conference in 1987 on chemical weapons incineration, it did not have the same catalyzing effect as the 1990 and 1991 conferences because it took place early on in the process of mobilization, although it was part of the process leading up to the larger meetings.
 - Smithson, A. "Chemical Weapons: The End of the Beginning", *The Bulletin of Atomic Scientists*, October 1992, pp.36-40.
 - The US signed the Geneva Protocol in 1972. Many are concerned that the US will use its powerful position to interpret clauses of the Convention to benefit its allies and penalise its perceived enemies. Already it is selectively choosing to classify chemicals and equipment used by "unfriendly" countries to produce pesticides, plastics and other civilian products as ingredients for nerve gases. Meanwhile its allies are allowed to continue producing and using such chemicals. See Panikkar, K. R. "Chemical Weapons ban treaty: The motives behind and the problems which lie ahead", letter in *Third World Resurgence* no. 28, December 1992, pp.2-3.

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Greenpeace/Marriner

Cattle crossing the Boro river in the Okavango delta

Botswana: Enclosing for Beef

by

Fred Pearce

Botswana has, in the past two years, become the scene of one of the most intense battles for the future of Africa's rangelands. Conservationists are fighting to preserve one of the continent's last great wild areas from cattle ranchers, whose fences are denying buffalo, zebra and wildebeest access to migration routes, and local bushmen access to their traditional lands. Elsewhere in Botswana, the Okavango delta, a vast area of wetland rich in wildlife, is under threat from dams and drainage schemes, and the mining industry's thirst for water.

The parched grasslands of Botswana contain more than twice as many cattle as people. The national herd has increased from a few hundred thousand in the 1950s and 1960s to close to three million. Cattle rearing has made a few hundred of Botswana's 1.5 million people very rich, but has also drastically reduced the once-teeming wildlife of the country's plains and now threatens "the jewel of the Kalahari", the Okavango swamplands which, as the rest of the nation faced drought during 1992, enjoyed one of its wettest years on record.

Fred Pearce is an environmental journalist and a consultant to *New Scientist*.

While cattle rearing is the traditional and revered business of the people of Botswana, it has become increasingly commercialized and centralized. Just 5,000 farmers, many of them government officials, today control the majority of the national herd. This élite has thrived on a succession of fat loans from the World Bank to build up giant ranches that have spread out to the more arid and fragile marginal lands. The driving force behind the ranches was the Tribal Grazing Lands Policy, adopted in the mid-1970s when a tse-tse fly eradication campaign was being waged in the land outside the Okavango swamp. The Policy parceled out a large proportion of the traditional

communally-owned tribal pastures to individuals. Much of that colonization was funded by the World Bank through a US \$1.65 million loan approved in 1972. Although studies showed that this project had yielded a "negative economic return", the Bank sanctioned further loans. Despite widespread defaulting on those loans in 1985, the Bank approved yet another loan of \$10 million to the government to create more ranches on tribal grazing lands.

Much of the beef has gone to the European Community under specially favoured trading arrangements. Beef exports to Europe are worth more than US \$100 million a year to Botswana and are sold

well above market rates, under terms of trade aid agreed with African nations under the Lomé Convention. Despite the national obsession with cattle rearing, these exports make up only about two per cent of the country's export earnings, which are dominated by diamonds and copper-nickel. Through large government subsidies, mining earnings in turn subsidize the cattle herds and make the leading land-owners very wealthy.

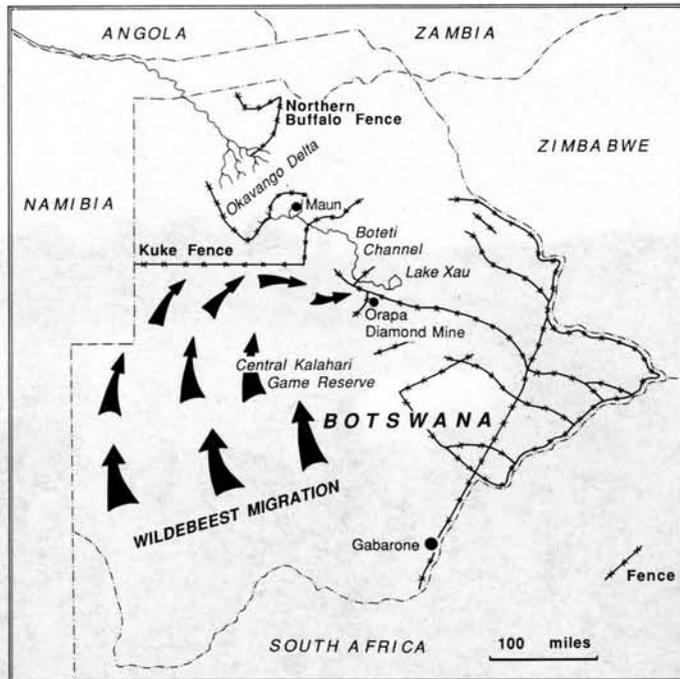
There have been claims that the discriminatory quota system, by which exports are regulated, favours larger commercial producers. In consequence, Botswana has one of the world's greatest

published disparities between richest and poorest. According to the United Nations, the income of the wealthiest 20 per cent of Botswana's population is 24 times that of the poorest 20 per cent, a ratio exceeded only by Brazil. Certainly the beef barons are a dominant force in Botswana.

The tragedy is that large cattle herds, which were once a valuable source of food and security for people living on a desert margin in times of drought, have now outgrown their usefulness and become an unsustainable parody of Western consumption patterns. Many cattle die of old age because the national cattle herd is far larger than is required to meet domestic and export demand. But the nation's psyche, bolstered by the system of subsidies, seems to demand that the country fill its land with ever more cattle which live by consuming everything around them.

Defusing the Criticism

The ecological damage of the beef industry has been considerable. According to Professor Per Wramner, a leading Swedish environmental scientist, "vast areas of natural habitats have been degraded in many parts of the country. The main cause is the expansion of the cattle industry." The destruction of pastures due to overgrazing on the new ranches during the 1970s and 1980s was ignored because, in the words of Dr Tabe Tietema of the Free University of Amsterdam, "an attitude prevailed that, if at a given location



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the land was degraded, one just had to move to the next area further west into the Kalahari." Even the cattle themselves have now begun to suffer as drought compounds long-term ecological deterioration. Up to 500,000 cattle, 20 per cent of the national herd, may have died in the past 12 months.

The steadily growing debate about the conflict between wildlife and the cattle ranches threatens the cosy relationship between Botswana's élite and the West; conservationists have targeted their complaints not so much in the Botswana capital of Gaborone, but in Washington, London and Brussels, where the key decisions are taken that underpin the finances of the cattle business. EEC Commissioners are keen to defend Botswana's ranching policies. After officials had visited Gaborone in 1991, they returned praising the cattle ranches, but admitted in their confidential report that the purpose of their mission had been to "gather information to defuse" a "mounting organized campaign" to discredit the policies.

The government of Botswana is fighting back with all the tools at its disposal — a London public relations agency, a studiously high profile at last year's Earth Summit, and a national conservation strategy which, for all its faults, is arguably one of the most sophisticated and wide-ranging in Africa. At the UN General Assembly in October 1992, Seeiso Liphuko, the secretary of the newly-established National Conservation Strategy Agency, declared that "Botswana spends more on conservation as a per-

centage of GDP than virtually any other country in the world, including twice the proportion spent by the US." His government argues that its new land-use policies have put an end to the "bad old days" and show a new acceptance that land is a limited resource.

The Euroscience Mission

Part of the Botswana government's response was to invite a team of environmental scientists, led by John Cooke, until recently professor of environmental sciences at the University of Botswana, to visit the country early in 1992

to comment on the country's conservation policies. As the team wrote in their report: "The brief of the mission was to be impartial judges in regards to the critiques and accusations levelled against the government of Botswana's environmental policies... which the government finds both unfair and disturbing, and which it fears might affect its relationships with those countries and agencies from which Botswana has received such considerable aid in the past."

Many members of the team clearly felt in some ways trapped by their hosts and by the London public relations company, Hill and Knowlton, which organized the mission through its subsidiary Eurosciences Communication. One member telephoned London from Gaborone during the trip asking for critical material to be faxed to his hotel since "we are only getting to see what the government wants us to see." Another member, Andrea Pfister of the Conservation Foundation in Britain, said the team had "little time even for discussing their opinions amongst themselves, let alone for pursuing independent investigations." Tietema added that because of time shortage "no thorough literature survey could be done... The checking of quantitative information could not be done as the requested information either is lacking, or was to date not yet received." Yet another, Professor Lawrence Harris of the University of Florida, said he "deeply regretted that a more thorough and professionally handled report was not possible."

Even so, the findings of the team were

deeply ambivalent, falling far short of the seal of approval hoped for by their hosts. Certainly they offer only feint hope that the government's new and much-touted conservation strategy will meet the concerns of the international environmental community. Under that strategy, more than 39 per cent of Botswana's land — including the grasslands, stretches of the Kalahari desert and the Okavango swamps — is, in the words of the government, "set aside for wildlife — a higher proportion than almost any other nation on Earth".

But, while the figures sound impressive, even Cooke, the team member who was most supportive of the government, said "it is really most confusing and misleading for government representatives to state, as they often do, that nearly 40 per cent of their land area is given over to wildlife." Some six per cent of the land is fully managed national park, a further 11 per cent comprise game reserves where the mission said the security of wildlife remained uncertain, and 22 per cent is available for wildlife management areas. Though the establishment of Wildlife Management Areas has been government policy since 1974, none, said Cooke, had been gazetted at the time of his mission.

These areas were in any case originally planned as stop-gaps. "The main intent in establishing Wildlife Management Areas," it was claimed in 1974, "is to ensure that until long-range planning is carried out, these lands are not ruined by other land use activities." But almost two decades later, many of their lands have been degraded and wildlife destroyed.

Even so, the science mission lent its support for the new conservation strategy. "Few countries can boast such a strategy," said the team, "formulated after full discussion with the people . . . and the government deserves proper commendation for its effort." But it was "too vague and watered down in regard to the cattle industry and its environmental consequences."

Enclosing the Bush

Central to the cattle problem are the thousands of kilometres of fencing that have been erected around blocks of cattle pastures. The first fences — about seven feet high and strong enough to resist a charging buffalo — were built to protect cattle from diseases carried by wildlife. Today such threats are much reduced, but the fences continue to be raised in order to

reassure customers in the EEC that no meat will reach European ports infected with foot and mouth disease from wild buffalo. Most breeds of cattle are totally unsuited to Africa's environments and are not immune to local diseases.

For the past three decades, as the "veterinary cordon" of fences has been built across the country, conservationists and scientists have become increasingly critical of its impact on wildlife. Successive governments, however, have denied that



One of the many signs now dotted around the Central Kalahari Game Reserve, the traditional hunting ground of the thousand or so surviving San Bushmen.

the fences do any damage, claiming that, except during serious drought, few animals are found dead against the fences. The Euroscience mission found little evidence of such deaths — spotting only a single giraffe carcass during its travels; but the team added that "finding only a few carcasses now does not say anything about the possible devastating effect of the fences when the wildlife population was at its proper strength."

The last great slaughter attributed to the fences occurred during the drought of 1983. The government says that although thousands of animals died, they died far from the fences and their deaths can be blamed on drought alone. Many conservationists disagree. They say that wildebeest heading for the waters of the Okavango found their way barred by the Kuke veterinary fence, changed direction for the nearby, dried-up Lake Xau, only

to die there for lack of grazing. "Without the Kuke fence the animals would easily have reached the safe grounds of the Okavango delta," said Tietema.

The scientists from last year's mission concluded that when the interests of wildlife and cattle come into conflict, the wildlife loses. The protected areas for wildlife may be large, they said, but they "do not constitute independent ecological units which can sustain large wildlife populations." The fenced areas of cattle pasture "block off the necessary migration routes of the wildlife from the Kalahari to the Okavango delta," said Tietema. These seasonal movements, by which animals take refuge in wetlands, where water and forage are available during the dry season, have been an essential feature of the region's great diversity of wildlife. As the fences have gone up, according to Wramner, "a far-reaching reduction of wildlife stocks has occurred."

"This is not a recent issue," said the scientists' report; there is "a long record of expressed concern about veterinary cordon fences in the published literature . . . The dismissal of these expressions as being groundless would constitute a serious error." The language may be cautious, but the message is clear. The report went on: "Government's impressions about historical wildlife movement patterns and the notion that wildlife does not need to move across the landscape, and the lack of significant negative consequences of veterinary cordon fences on native wildlife populations, do not seem to be based on scientific data."

Few studies of the population dynamics of wildlife in the region have been undertaken. Nonetheless, says Tietema, "at least of certain species once abundant, only a minute proportion are left." Big herds of zebra, wildebeest and hartebeest "could still be seen in the early 1980s." Yet, during hours of flying back and forth across the area in 1992, "it was remarkable how little wildlife could be seen."

The report suggests that some fences should be dismantled and that whole blocks of grazing lands might need to be abandoned in order to restore migration routes. Tietema now called for the creation of wildlife corridors to recreate the routes. But the report also concedes that some of the fences might be viewed as environmentally beneficial. The western cordon fence, built in the early 1980s, "has prevented cattle encroaching into the Okavango", it says, and so "has contributed to a great extent to the protection

of the Okavango." Future fences could serve that purpose, too. "Cattle encroachment . . . is the one event that must be prevented at all costs."

But of greatest concern for the team of scientists was the intended new 80-kilometre Northern Buffalo Fence, which has caused a public outcry both among villages around Okavango and more widely in southern Africa. The fence, by cordoning off the northern borders of the swamp, will give cattle safe, disease-free access to the last commercially unexploited dry grasslands in the far north of the country — an area that the scientific mission proposes should become part of an international wildlife reserve.

There has as yet been no environmental impact assessment into this project, though a detailed debate continues about its precise route. Safari operators want the fence set back from the wetland, beyond the seasonally flooded areas of the Selinda valley, to keep out cattle from the fringes of the Okavango. Cattle ranchers want the fence close in, making the valley free for grazing. Hunter-gatherers want no fence at all, believing, as Pfister puts it, "that it would eventually become a boundary closed to them."

Bush for the Bushmen

One thing the scientists and government do agree on is the "inconvenience" of the traditional cattle herders and hunter-gatherer Bushmen operating within the Central Kalahari Game Reserve. The arid reserve, which is about the size of Switzerland, was set up in 1961, five years before Botswana's independence. It was originally envisaged as a means to protect the traditional hunter-gatherer lifestyle of the San Bushmen. But this aim was gradually sabotaged as restrictions on use of land were imposed on the San.

In the mid-1980s, a system of zoning was created under which two central areas will be kept "pristine" — that is, devoid of people. Buffer zones will be developed around these central areas, with special tourist camps as the only permitted settlements. Outside the buffer zones, there will be a wildlife management area in which permanent settlements will be allowed.

In 1989, President Quett Masire claimed that the few hundred people who remain in the reserve "posed a threat to the wildlife". Survival International, a British-based human rights group, re-

Camera-toting safari tourists may be hastening the Okavango's end.

sponded with angry protests to the government after threats to remove the San from parts of the reserve. It charged that, "when touching pictures of dying wildebeest started appearing on television screens," the government attempted to shift the blame from the commercial cattle herds and fences to the native communities on the reserve.

"It is difficult to see how the government's move to give 'higher priority to wildlife' in the game reserve by driving out the indigenous people is anything other than a circuitous attempt to placate the anger of environmentalists without interfering with profits from ranching." It added that "at the same time . . . the government is granting leases to mining companies to prospect in the reserve."

The Euroscience team made their priorities clear. "The pristine preservation of the Kalahari ecosystem should be seen as the prime issue." But after that, they become confused. At one point they say that "traditional and small-scale farming seem to be more the potential victims of land degradation rather than its cause." They explain how the San that they visited "have found themselves further and further distanced from the resources on which they are dependent." But they see no prospect of returning to those resources. "Though speaking fondly of their past, the people interviewed were aware that it was over and had no wish to return to it. To be Batswana and to own cattle is what they have been taught to want." And yet, "to grant them such a wish would be to condemn them to destitution in a wasteland within a very few seasons indeed."

The Department of Wildlife, which is in charge of the reserve, says that traditional cattle ranching in the Kalahari, which the San now wish to emulate, is a threat to the wildebeest migrations, and the scientists back the policy of removing the bushmen from the reserve. "There is no easy solution involving the remote area dwellers living in the reserve," the scientists conclude. "As harsh as it may sound, the current policy may be the best available . . . provided that the options are real, that no coercion is used."

Not every observer agrees that all Bushmen are determined to abandon their way of life. John Perrot, a petroleum

engineer working for the US company Bechtel and author of the book *Bush for the Bushman*, notes that:

"In Australia, where the Aborigines have been given back some of their traditional land since the mid-1970s (30-40 per cent of the land area in the Northern Territory), more of them are now going 'back to the bush'. If given land with wild animals, like access inside game parks and reserves, and water, and protected from incursions by cattle, some Bushmen certainly would so choose."

Draining the Kalahari

In contrast to the arid grasslands, the Okavango is a land of papyrus and lush grass, crocodile and buffalo, elephant and lechwe, giraffe and hippopotamus. The sitatunga live here, antelopes with elongated hooves that allow them to walk through the papyrus swamps. Fish breed across the floodplains each summer. At 15,000 square kilometres, it is one of the largest wetlands anywhere in the world, receiving water from rivers that flow out of Angola and Namibia. Most of it evaporates in the desert heat, but in exceptionally wet years, it overflows east into the Zambezi basin.

Even here, there is growing evidence of wildlife in full-scale retreat. "The paucity of wildlife that we observed causes us to be very reserved about overly optimistic statements," said Harris. One cause may be the massive spraying of the delta over the past 40 years with DDT, dieldrin and more recently endosulphan in an effort to eliminate the tse-tse fly. This insect's bite, besides causing sleeping sickness (trypanosomiasis) in humans, can infect domestic cattle with a fatal version of the same disease, although indigenous wild animals are immune.

But the Okavango delta offers a much more significant potential resource than mere pasture. In 1986, the government of Botswana proposed the South Okavango Integrated Water Development Project. The plan was to dredge the Boro river, a major waterway within the Okavango, as it leaves the swamp, with the aim of reducing evaporation and providing water for reservoirs at the swamp's edge. The reservoirs would irrigate planned farms around Maun, Okavango's largest town, and perhaps serve other purposes.

The government declared soon after, however, that the water would instead be

left in the river to travel down the Boteti channel, a seasonal river that flows from the Boro out of the swamp before giving out in the desert at Lake Xau, near the world's largest diamond mine at Orapa. The mine is run jointly by the Botswana government and the South African mining conglomerate, De Beers, under the name Debswana. Diamonds make up 80 per cent of Botswana's export earnings.

Debswana's officials for the moment deny all interest in the Okavango waters. But they have not always been so diffident. Until Lake Xau dried up in the 1980s, the mine had taken water from the lake. And a decade before, the company had itself dredged part of the Boro in an effort to increase flow to the lake. The mine's waters now come from fifty boreholes that tap groundwaters beneath the desert. By 1990, it used around five million cubic metres of water a year, a figure which could double within a decade. With the water table falling fast, this source cannot last forever.

Greenpeace, which conducted a brief campaign in 1991 to defend the Okavango, believes that the mine does want the Okavango's water, and accused mine officials of attempting "to distance themselves from the potentially damaging publicity" of a confrontation with environmentalists, not without reason. At the time, Greenpeace was considering running a worldwide campaign to save the Okavango under the slogan; "Diamonds are for Death."

The dredging would not, as some claim, have "drained the Kalahari". As former director of Botswana's National Museum Alec Campbell put it, the proposals are limited and "will cause little damage. It is if they are later extended that damage will occur." The real threat to the wetland, he says, lie west in Angola and Namibia, where the Okavango's water originates. By trapping the water behind proposed dams, these two countries between them "could seriously diminish the delta's inflow, with catastrophic effects."

In 1991, the Botswana government halted dredging of the Boro after massive local opposition. Farmers feared that it would damage their traditional method of farming plots on the floodplain around the swamp as it receded each autumn. The townspeople of Maun feared that draining even part of the delta could scare off some of the 30,000 tourists that annually climb into boats to take the "trip of a lifetime" through the swamps.

The government itself received a re-

port from Greenpeace, which warned that "dredging creates the greatest threat to the Okavango delta: wildlife, including rare and endangered species, will be displaced as their habitats are lost." The government agreed to Greenpeace's suggestion that it explore other sources for water, while, in the words of the Minister of Mineral Resources and Water Affairs, A. M. Mogwe, "keeping the dredging issue open, if in the end it is the only option through which the government can meet its obligations to provide water to Maun and communities down the river". The problem is that few alternatives exist — in particular, for the fast-expanding diamond mine. Many believe that, in time, the project will reappear.

Nor are the diamond mines likely to be the last demand on the Okavango. The Boteti channel could become the first stage in a giant canal that extends hundreds of kilometres beyond the diamond mines at Orapa right across Botswana and on down to Transvaal in South Africa.

A UN study of southern Africa's water resources concludes that "the value of the Okavango wetlands is probably incalculable and will become even more so as the wildlife of Africa and in particular its wetlands diminishes to a shadow of its proud and majestic past." But the same report warned that in Botswana "water scarcity will become a major constraint on development".

"Saviours with Cameras"

The future for wildlife in Botswana, all members of the Euroscience team agreed, was its economic utilization. Wramner calls the country's wild animals "unique in a global context and natural assets of inestimable significance to biodiversity conservation, wildlife utilization, tourism and other kindred uses." Hunting, or "harvesting", would play a prominent role in this.

But the key, in their view, is tourism — and the key to tourism is the Okavango delta. Many conservationists see the increasing economic potential of tourism as the means to persuade the government and local inhabitants to preserve the wetlands and the animals there. As in Kenya and Tanzania a generation ago, tourism is being projected as the saving of the wild lands.

The government's latest policy emphasises "high-revenue, low-impact tourism" in which "a select group of visi-

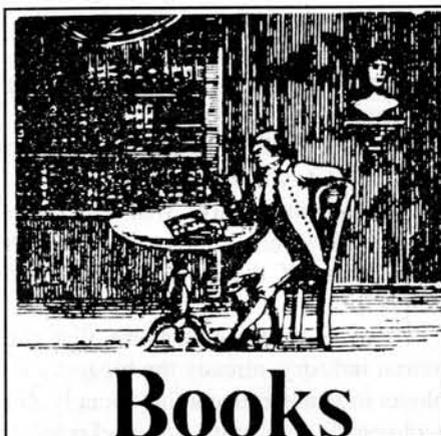
tors will be allowed to take part in wilderness experiences, view game and hunt". In effect, tourists will take the place of Bushmen in the parks and game reserves. They will be able to hunt legally, while local citizens will be labelled poachers. The government says that its "anti-poaching laws are strictly enforced with the support of the Botswana Defence Force."

There is growing concern that the tourist industry, already the biggest employer in Maun, is becoming socially and ecologically destructive. Up-market safari operators are ruling the roost in large areas. Says Alan Bird, an environmental planner, "there is considerable unease among the local population as to the élitist nature of some of the tourist development . . . Local people in the Chobe area say that they are being denied the right to plant, hunt, gather wood and so on because the land is increasingly set aside for wild animals that the tourists come to see. There has been significant livelihood loss and out-migration to urban areas."

Some 12,000 elephant tusks passed through the main trading post at Maun in the years before 1867. Today, most of the 40,000 people who live in the Okavango region still live by fishing, hunting, harvesting wild plants and herding cattle outside the fences. Camera-toting safari tourists are the growing industry. Many believe that the real threat to the Okavango comes not from cattle or from fences, but from the future demands of tourism. By painting such evocative images of the wetlands and thereby encouraging the "eco-tourists" to come and see for themselves, the advocates of tourism may be hastening the Okavango's end.

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Power and Knowledge

EXPERTS IN THE AGE OF SYSTEMS, by William Ray Arney, University of New Mexico Press, Albuquerque, 1991, \$22.95 (hb), 242 pp. ISBN 0-8263-1268-3; **PRIMATE VISIONS: Gender, Race and Nature in the World of Modern Science**, by Donna Haraway, Routledge, London, 1989, £40 (hb), 486 pp. ISBN 0-415-90114-6, Verso, London, 1991, £14.95 (pb) ISBN 0-86091-582-4; **THE DEVELOPMENT DICTIONARY: A Guide to Knowledge as Power**, ed. by Wolfgang Sachs, Zed Books, Ltd., London, 1992, £14.95 (pb), 306 pp. ISBN 1-85649-044-0; **DOMINATION AND THE ARTS OF RESISTANCE: Hidden Transcripts**, by James C. Scott, Yale University Press, New Haven, 1990, £19.95 (hb), 251 pp. ISBN 0-300-04705-3.

We Western environmentalists often seem to regard engaging in politics as if it were a matter of using a sort of high-tech video player. We picture ourselves innocently feeding cassettes labeled "scientific knowledge", "holistic understanding", "grassroots concerns" or "alternative values" into a clicking, whirring machine called "power", adjusting the controls, then sitting back and waiting for a better world to come up on the screen.

Although the better world never quite seems to materialize, the attractions of the metaphor are easy to see. Flattered by the idea that we are skilled in distilling ideas into cassettes to be processed by unenlightened politicians or the restive masses, we greens are also relieved at the

implication that we don't have to bother our heads about how the video player actually works. Powerful élites, delighted to be identified as one set of proprietors of this indispensable black box, are happy to join in the game and solicit all the cassettes they can get, knowing that whatever they contain, and whether they produce beautiful pictures or not, they can hardly do the machine any harm. Utopian critics and technical consultants, meanwhile, disgruntled at the unsatisfactory results of previous playbacks and inclined to blame the video player, are captivated by the idea that it might someday be replaced by one which can play with absolute fidelity the cassettes of Truth, Justice and Ecology which they have so carefully prepared.

Small wonder, then, that satires by Marx, Nietzsche, Wittgenstein, Foucault and their followers — to say nothing of those by dominated peoples — have never quite succeeded in discrediting this sort of metaphor. As middle-class Western environmentalists, we are often so fond of our self-image as virtuous, self-deprecating people who "speak truth to power" that we cannot admit even to ourselves that it is power relations which determine which truths can be spoken when. Nor is it easy for us to acknowledge that power is not a black box but a set of social meshes we must work within and against, that our cassette-producing industry is itself a culture-specific power game, and that in fabricating and marketing our neatly-packaged versions of "nature", "society" and the like we are already making political moves which, although they sometimes benefit our allies, can also backfire on us and oppress others.

These four books, extraordinary as they are, may not disabuse us of all of our illusions about knowledge and power. But for curious and open-minded environmentalists and others, they each, in their different ways, offer useful new tools for breaking through to a different political awareness and self-awareness.

Complex Systems

William Ray Arney's *Experts in the Age of Systems* argues that complex 20th-century systems of expertise of the sort which build nuclear weapons, manage modern economies, provide medical or psychological therapy or model "ecological sustainability" create a new brand

of experts as their agents and objects. These "specialists in the general" — J. Robert Oppenheimer, who managed the gigantic programme to develop the first atomic bomb, is Arney's main example — are neither compartmentalized within specific branches of expertise nor masters of everything that is going on in their systems. Confronted by multiple interacting feedback loops and unimaginable complexity, they think holistically, mobilize resources, break down boundaries and facilitate interaction among far-flung components in order to help systems whose direction they cannot dictate "achieve their potential". Traditional moral language does not really apply to these experts, who, while retaining their individuality, see their expertise and lives swallowed up in the often violence-engendering systems they look after. "Not entirely alive" to their actions, and often living somewhere in the zone between executioner and victim, they are not felicitously described as either responsible or not responsible for what they do.

This description will strike a chord with anyone who has felt the anachronism of talking ethics with executives of transnational corporations or who has heard World Bank officials explain how they are effective in helping change things for the better but are not responsible for the "inevitable" dislocations which happen as the result of their actions. But Arney's point is broader. If contemporary systems of expertise offer no footholds for traditional "responsible experts", there are equally no footholds for those who would criticize them or offer alternatives from outside. Usually immune to isolated errors, interventions, or threats of force, these systems cannot be held to any set method for producing knowledge or action. Instead of homogenizing diversity, they incorporate it. Not needing to maintain a compartmentalized or hierarchical structure, and possessing no foundations, they are only too happy, amoeba-like, to surround and incorporate the "radical alternatives" proposed by any critic. Thus, just as they dissolve boundaries between areas of expertise, so they dissolve boundaries between themselves and their critics, whose views tend to get absorbed into the system under discussion as soon as they start talking.

No one who has read *Experts in the Age of Systems* will be able to speak as brightly or uncritically ever again about "holistic" or "systems" or "ecological" thinking as the solution to our problems.

To borrow the words of one of Thomas Hardy's critics, the book has "added more reality to the world". Little of what Arney describes, however, is new to the 20th century except in its scale. Traditional scientific practices, after all, are often as holistic, pragmatic, improvisatory, resilient and critic-coopting as Arney's "complex systems". Indeed, all languages and traditions can be said in some sense to turn the people who partake of them into the simultaneous agents and objects of the moral or scientific projects and worldviews they embody; the process by which critics of today's complex systems are converted into what Arney calls "dead but real" components of those very systems is in truth merely a particularly chilling instance of the ancient phenomenon of "loss in translation".

When Arney suggests that critics can avoid being sucked into the systems they criticize by "laughing" and "saying No to reasonable requests for alternatives", moreover, he is telling only part of the story. As Arney's hero Foucault knew well, such laughs and such "No"s emanate not from some imaginary rock-solid point outside history and society, but rather from other languages, other traditions, and other systems — all of which have their own mires and dangers from which critics will also have to distance themselves. What look to critics like laughs or "No"s, moreover, have a nasty habit of turning into "alternative proposals" when let loose on the world at large.

Primates and Power

Donna Haraway's magnificent, playful *Primate Visions* displays a more radical and multilayered understanding of history, science, love, power — and laughter. Using stories told about monkeys and apes in 20th century primatology and popular culture, Haraway shows how the "nature" and science we Western environmentalists and others so confidently refer to in order to justify our politics are themselves part of that politics.

Gender, race, capitalism and colonialism, Haraway argues, both "enable and constrain" scientific observations, facts, experiments and theories. In primatology research as well as in films, museum dioramas, nature reserves and paperback fiction, these themes are "written on the bodies" of monkeys and apes themselves. "Nature is given our history, even as our history is made to seem natural because

we see ourselves in [the] animate, multi-form mirrors [of nonhuman primates]."

Thus while male field researchers in the early decades of the century automatically focused on male primate activity, assuming that was the key to social organization, later, more feminist-oriented scientists have given pride of place to the roles and lives of females. Similarly, during a time of great concern in America over the stability of white families in suburbia and the supposed "pathology" of mother-centered black families, one prominent scientist enclosed rhesus monkeys in an apparatus which forced them into heterosexual monogamous "nuclear families", thereby generating reams of data about the functions of fathers in "family life". Japanese primatology, meanwhile, although at least as masculinist as its Western counterpart, has looked at monkeys not as keys to the truth of some underlying "nature" they share with humans, but as actors negotiating the traps of a complex social world which bears a suspicious resemblance to that of the Japanese themselves.

In recounting such stories, Haraway's intention is not to debunk science or other tales about "nature" as legitimate sources of authority for political positions, but to point out that this authority never derives from "disinterestedness". Finding science's genuine sources of authority, and distinguishing between better and worse science, requires supplementing the self-flattering accounts science likes to give of itself — which often suggest that it is progressively eliminating nonscientific "bias" by working to ensure that more and more of its results are dictated to it by a "nature" outside "culture" — with other accounts which show how this "nature" is itself constructed. In this enterprise the points of view made possible by the politics and theories of feminism and anti-racism are indispensable. As such points of view gain in power and self-awareness, a knowledge may emerge in which a "less hostile order of relations among people, animals, technologies and land" can be envisioned.

Haraway makes space within *Primate Visions* for the different points of view necessary for her project by politely declining to speak in the "authoritative mode" customary to scholarly books. While drawing on Marxism, scientific realism, and many other currents of thought, she does not allow any one strain to force the others into harmony with

itself. By the same token, she encourages us to read primatology not merely as scientists would have us read it, but also as a retelling of Christian origin myths in an anxious postwar era, as science fiction, as a story of racism, sadism, violence and love practised on human and non-human primates in the South and the North, as a tale of male domination and feminist resistance, and as a "simian Orientalism" which treats non-human primates as a passive resource of "nature" and "sex" from which useful Western myths of "culture" and "gender" can be constructed. An adept decoder of both the most abstruse technical literature and the hidden messages of David Attenborough documentaries, American greeting cards and National Geographic articles, Haraway crowds startling insights into almost every line of this very long, deeply serious, but consistently fun book.

Dangerous Words

The Development Dictionary, like Arney's and Haraway's books, explores how "uncontroversial" concepts, used to reinforce and structure relations of domination, can wreak appalling violence. Here the concepts in question are those which have helped organize the disintegrating 40-year-old project of "Third World development" — concepts like "progress", "standards of living", and "population". Peering beneath the sheen of such ideas into their history and implications, the 17 scholars and activists who contribute to the book find ample reason for bidding farewell to the whole idea of development in order to "clear our minds for fresh discoveries".

Some of the words the book investigates have venerable traditional uses, but quickly acquire Orwellian functions when joined to the apparatus of modernization and global capital flows. The terms "equality" and "poverty", for example, are used in the world of development not (say) to attack repression, injustice, or exploitation, but to urge people to become players in an identical economic game which will make them all rich. Yet playing this game leads only to increasing economic inequality and suffering: in 1960 the North was 20 times richer than the South, in 1980 46 times, and the disadvantaged are under greater pressure than ever.

Similarly, as Marianne Gronemeyer points out, whereas "help" used to signify

(among other things) a spontaneous response to a cry of pain, it is now something the need for which is determined by "aid" institutions over people's heads — giving those institutions an excuse for taking over more and more of people's lives, with deadly results. "Participation", too, as Majid Rahnema observes, becomes in the hands of developers little more than a tool for "involving the patients in their own care" — care which can only be provided by the self-application of a global model of progress. And "empowerment", perhaps predictably, is used to *disempower* ordinary people. By suggesting that those to be "empowered" have no power and must rely on others who have a secret formula for initiating

them into it, it lays the ground for a reprise of colonialism. Even the "sharing" and "exchange" between Southern and Northern cultures which is proposed by the most progressive development thinkers as a response to decades of imposed development models can do little more than reinforce a unitary system of Western domination. It is the dominant, after all, who are usually most eager to make themselves understood, "celebrate diversity", or "make the people visible"; the oppressed often have good reason to remain silent in the presence of a superior power which could use their knowledge against them.

Other words in *The Development Dictionary* name new gods which have

arrived on the scene only in the modern age. Arturo Escobar helps us see how development planning, for instance, is structured to lead Northerners to believe that problems are "over there in the South", thus fingering Southern societies for the destructive interventions of capitalism. And in a discussion which resonates with that of *Primate Visions*, Claude Alvares stresses the ethnocentric and parochial nature of Western science and its tight links with development and the modern state, rejoicing that the Indian culture he was born into "continues to exercise greater influence and power over behaviour than modern science does, or will ever do."

Alvares, like other writers in *The Development Dictionary*, would thus presumably be impatient with Bill Arney's suggestion in *Experts in the Age of Systems* that the corrosive "humour" of critical intellectuals like Foucault can open up a "way through the violence" of modern systems for the "common folk" who "might make meaning if the heavy-weights of meaning-making were gone and the fields were open". In fact, "common folk" have never ceased to "make meaning", and neither intellectuals nor other members of dominant classes are in any position to "open up" paths for them.

Hidden Transcripts

James C. Scott's meticulous *Domination and the Arts of Resistance* provides evidence of a different sort for this view. Drawing on years of study of oppressed groups around the world, Scott concludes that it is an illusion to think that dominated peoples are trapped under an ideological yoke of "false consciousness" set in place by élites (and which, it is sometimes added, the help of radical intellectuals is needed to throw over). Not only do dissident consciousnesses exist everywhere among the oppressed; they are also a crucial part of the politics of resistance and revolution. If this "meaning-making" of ordinary people is usually less publicly visible than, say, the domineering discourses of development or of science, this is merely because the weak know when to shut up or act dumb.

In what may at first seem a paradox, these oppositional discourses of the oppressed are, to borrow Donna Haraway's terminology, not only "constrained" but "enabled" by relations of domination and

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subordination. The polite language and public rituals of deference and compliance required of subordinates in order to keep them in their place and bolster the confidence of their superiors, for example, become in the hands of the oppressed a veil and a barrier behind which they can safely build a critical, self-policed discourse which the powerful find difficult to penetrate. The rich's power to speak more freely in public than the poor gives the latter another intelligence advantage. Dominant groups' expropriation of goods from their subordinates, meanwhile, is inevitably accompanied both by ideological justifications (which, as in the case of *noblesse oblige*, the weak can often make sly use of to extract concessions from the strong) and by the imposition of personal indignities which provide a seedbed of anger nurturing the "hidden transcript" which the oppressed develop among themselves in their own language or in protected sites off the public stage such as pubs, marketplaces, woods, trains, and office canteens.

Whenever possible, selected bits of this hidden transcript, or actions prepared or justified by it, are infiltrated into the elite-controlled public realm in low-profile, ambiguous or unpunishable forms. Anonymous rumours, leaflets, threats and sabotage, together with double-edged stories, jokes, folksongs, dramas, tricks and cross-dressing gambits, are relatively safe means of pressuring the powerful into concessions or rallying and unifying the oppressed. Half-intelligible grumbles are followed by more daring gestures which explore the limits of the power of elites to enforce compliance with their norms. Shirking and pilfering drain the resources of the powerful, while discreetly challenging their ability to appropriate surplus. Poaching is used not only to satisfy hunger and the desire for adventure, but also to assert common rights to forest products set out in the hidden transcript, and often touches off a process of provocation, repression, outrage, and rebellion which in turn provides further stories to be told behind the masters' backs, sustaining resistance. The anonymous challenges to authority which surface in carnivals or spirit possessions, meanwhile, are sometimes used as rehearsals or detonators for larger-scale revolts. Swift, spontaneous, leaderless and evanescent mob action, in which everyone can instantly find a protected, anonymous role, is also a valuable resource for the oppressed. All of this is enabled by

informal networks of market, neighbours, family and community which have the virtue of having other, officially-sanctioned functions which make it difficult for the authorities to suppress them.

"Under the conditions of tyranny and persecution in which most historical subjects live," Scott maintains, this sort of activity "is political life." Everyday resistance by the weak not only leads to real material gains and losses, but also forms the active medium in and against which dominant structures of power and knowledge must grow and shape and justify themselves. Not least, it lays the groundwork for those explosive popular movements which so bewilder observers who have confined their gaze to the overt activities taking place on the public stage. The relevance of Scott's work to the understanding of movements centered on the defence of common forests, land, water and air is unmistakable. By illuminating at least a few corners of the hidden politics of resistance, he provides new hope as well as new awareness for all those who would like to think of themselves as activists.

Larry Lohmann

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Nuclear Survivors

EXPOSURE: Victims of Radiation Speak Out, by the *Chugoku* newspaper, translated by Kirsten McIvor, Kodansha, Tokyo, 1992 \$25 (hb), 327 pp. ISBN 4-7700-1623-9.

The harmful effects of radiation have been known, if not always fully understood, since scientists started experimenting with radioactive materials about 100 years ago. Many of the early researchers died from work-related illnesses: Marie Curie, for instance, died of leukemia. Yet in the last 50 years, since the power of the atom was harnessed for military and industrial purposes, nuclear scientists have been at pains to claim that this new form of energy is safe, and to deny or conceal evidence that it is not.

The nuclear issue affects all of our lives, and will continue to do so. Fifty years ago plutonium did not exist outside the laboratory; 100,000 years from today, it may well provide the most tangible

evidence of the human species's short existence. Yet the dozens of books and learned articles on the subject have tended to focus on the technology itself, and on questions of science, morality, military strategy and economic theory. Everyday accounts of what the nuclear industry does to human beings and their environment have become buried beneath the technobabble.

In 1989 the *Chugoku* newspaper, based in Hiroshima, set out to investigate radioactive contamination around the world by talking to the victims of the nuclear industry. The resulting human interest stories, first published in a series entitled "Hibakusha [Radiation Survivors] of the World", are now available in this English language edition.

Exposure finds these victims on every continent: of the main nuclear powers, only China and Israel managed to escape the journalists' scrutiny. Their injuries and illnesses are attributable not only to military and civil, but even to medical uses of nuclear energy.

The Hiroshima journalists talked to people about the effects of their injuries and illnesses on their families, their agriculture and fisheries, and their local environment. Wherever they went, they heard the same tales of official lies and secrecy. Every kind of nuclear facility was said to be safe. There were said to be no leaks; or if there were, they were claimed to be so small to be harmful. It was always asserted that there was no risk of accident. Accidents that did happen were covered up — prior to Chernobyl, at any rate. Local people complained that they were never told of the risks, while health authorities denied that there were any illnesses. Such was the scale of public misinformation that these journalists found, to their amazement, that *they* were regarded as experts on radiation.

Large areas have been made virtually uninhabitable by nuclear activities, some by accident or negligence, others by deliberate experiment. People who bear no responsibility for and gain no benefit from nuclear power have invariably been the worst affected. Australian Aboriginals' territory has been contaminated by British nuclear tests. Pacific islanders have been driven from their birthplaces by decades of American and French testing, and have suffered the most appalling health problems, including stillborn foetuses which bear little resemblance to human beings. The Navajo people of North America share with the Namibians

of southern Africa the unwanted consequences of outsiders mining for uranium on their land. The Lapps, whose traditional nomadic lifestyle does not need power stations, have found their existence threatened by contamination from Chernobyl, thousands of miles away. When the Russians carried out nuclear testing in Kazakhstan, they made sure the wind was blowing from the north (just as when the Americans test on Western Shoshone territory, they make sure the wind is blowing away from Las Vegas). In India, the government promotes nuclear power with the same obsession for secrecy, extravagant claims for cheap electricity and reckless disregard of the risks as the original nuclear powers.

Shock and Familiarity

These stories may be familiar, but they have not lost their power to shock. Few people, in fact, appreciate the full scale of the current nuclear disaster. The authors of this book (who are not ecologists or political activists, but mainstream journalists) remark that the general public is more concerned than ever about the earth's environment, but that the issue of radioactive contamination has been left out of the environmental debate. This is surely due to the fragmentation of anti-nuclear campaigns. Despite the efforts of Greenpeace, nuclear disarmament has been seen as a political goal or moral imperative rather than an environmental necessity, and environmental groups have preferred to concentrate on the civil side of the nuclear industry.

This book of high-standard of journalism may help to persuade activists of the irrationality of separating one use of nuclear power from another. All aspects of the nuclear cycle give rise to health and environmental risks, but especially mining, weapons testing and reprocessing. At a time when the Japanese, French and British governments have blithely decided to increase these risks by setting up a world economy in plutonium, a reminder of how real lives and habitats are scarred by nuclearism is long overdue. The humanity and dignity of the *hibakusha* shines like a beacon against the dark deception and crass smugness of their faceless oppressors.

Hamish Soutar

Hamish Soutar is a British peace campaigner, and currently co-editor of a green community paper in Wiltshire, UK.

BOOKS DIGEST

- **FOR LOVE OF THE AUTOMOBILE:** *Looking Back into the History of Our Desires*, by Wolfgang Sachs, trans. from the German by Don Reneau, University of California Press, Berkeley, 1992, \$30 (hb), 222 pp. ISBN 0-520-06878-5.

This study of the rise of the car and its infrastructures in Germany, first published in German in 1984, describes, with much documentation, how popular daydreams of freedom, "escape" and status were politically manipulated to create consumer demand and to nourish an artificial economy. The antidote is to return to the concept of streets as commons and to enjoyment of the nearby.

- **SOCIETY AND NATURE:** *Towards a Green Social Theory*, by Peter Dickens, Harvester Wheatsheaf, Hemel Hempstead, 1992, £9.99 (pb), 203 pp. ISBN 0-7450-0967-0.

Dickens argues that the early ideas of Marx and Engels, suitably criticized and developed, offer the best available basis for a new "ecological" sociology which tackles the issue of people's alienation from local nature. This challenging, erudite book will have much to teach deep greens, socialists, biologists and psychologists alike.

- **WASTING THE RAIN:** *Rivers, People and Planning in Africa*, by W. M. Adams, Earthscan, London, 1992, £12.95 (pb), 256 pp. ISBN 1-85383-089-5.

Adams, a professional geographer, examines how large, high-tech dam and irrigation schemes in Africa are a waste not only of money and labour but of water itself. Pointing out that outside development agencies are poor at learning from their mistakes, he concludes that "the future of African rural people must be based on the informal skills of local people, organized and directed in concerned political and practical action by those people themselves."

- **RADICAL ECOLOGY:** *The Search for a Livable World*, by Carolyn Merchant, Routledge, London, 1992, £10.99 (pb), 276 pp. ISBN 0-415-90650-4.

This primer expands the notion of radical ecology to include not only social ecology, deep ecology, spiritual ecology and green politics, but also eco-feminism and sustainable development. The book offers a sharp summary of ecological problems, but its relatively shallow and unrigorous treatment of ecological movements may disappoint readers of Merchant's previous *The Death of Nature* and *Ecological Revolutions*.

- **CHANGING PERCEPTIONS:** *Writings on Gender and Development*, ed. by Tina Wallace with Candida March, Oxfam, Oxford, 1991, (pb), 324 pp. ISBN 0-85598-137-7.

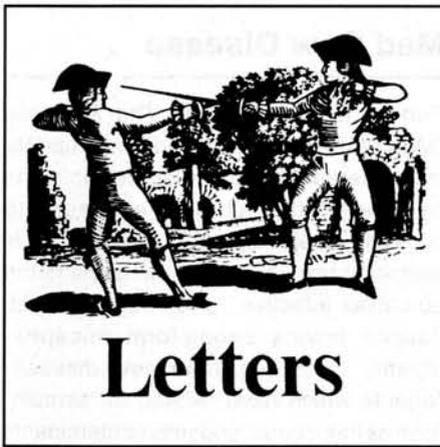
Although it has begun to be recognized that women's needs and abilities are overlooked in "development", incorporating women into development projects is unhelpful. This overview, which is both practical and theoretical, of gender and development is illustrated by wide-ranging case studies, set in the context of current debates.

- **CONTESTED FRONTIERS IN AMAZONIA**, by Marianne Schmink and Charles H. Wood, Columbia University Press, New York, 1992, \$52.50 (hb), 387 pp. ISBN 0-231-07660-6.

Drawing on quantitative surveys, detailed interviews with residents of frontier communities, and political and social analysis, Schmink and Wood explain how competition for resources among groups of varying power have led to violence and forest decline in southern Pará over the past few decades. A valuable attempt to address the issue of forest colonization in all its local, national and international complexity.

- **TOWARDS AN ECO-CITY:** *Calming the Traffic*, by David Engwicht, Envirobooks, Sydney, available from Jon Carpenter Publishing, 33 Newton Road, Oxford OX1 4PT, 1992, £9.99 (pb), 190 pp. ISBN 0-85881-062-X.

A lively illustrated book by a Brisbane activist whose community's fight against the upgrading of a local road led him ultimately into a wide-ranging, historically-informed investigation of practical ideas on how cities can be made less car-dependent and more livable.



three years. Another China every 12 or so years! Perhaps this is the "underpopulation" problem your authors seem so concerned about?

Your July/August 1992 edition has the same pronatalist flavour as Betsy Hartmann's book, *Reproductive Rights and Wrongs*. It was there I was introduced to the stunning notion that Africa's woes may actually stem from the fact the entire continent is seriously underpopulated. From page 4 on we hear the continuous refrain: "The myth of overpopulation is one of the most pervasive myths in Western society . . . The myth of overpopulation is destructive because it prevents constructive thinking and action . . ." etc. and on and on.

I would like to pose a question to your readers: Do you agree with Betsy Hartmann and her associates that overpopulation is a "myth", pure and simple, and the word need no longer blacken the halls of our memories? Do you believe the Earth and all its inhabitants will be better off with 12 or 14 billion human beings on it (the current UN projections), rather than the current "paltry" 5.5 billion? Do you imagine people who already feel lost and powerless in today's giant, impersonal societies will feel any better when they grow to be two or three times larger? Do you believe the real issue is that women's reproductive powers are being "restricted" by sinister white male élites? If you answered "No" to most or all of the above, please join me in opposing the current revisionist crusade to convince people "Overpopulation is a Myth."

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The Editors reply . . .

Whose Common Future? *neither answers, nor indeed even raises, the question "Are there too many or too few people on the Earth?" Nor does it take up the question of whether "overpopulation" or "underpopulation" is a myth. Nor does it suggest anywhere that women should "reject contraceptive methods whenever and wherever possible".*

Whose Common Future? *does, however, look at some of the reasons for the rapid rise in numbers of people, does assess many attempts currently being*

made to bring the growth rate down, and does point out that the concepts of "overpopulation" and "underpopulation" have political uses. It does not follow from any of this that it claims that numbers can go on rising indefinitely.

To ask, "Who controls reproduction?" is not to imply that there should be no controls. To try to answer this question is merely to point out that what those controls are, how they are designed to work, and how effective they are depends on who decides on the numbers of children to be born and raised. Is this to be the Rockefeller Foundation? Paul Ehrlich? The pharmaceutical industry? US security interests? Husbands? Or the women who, at present, are the majority users of contraceptives, who get pregnant, who know the risks and burdens of childbirth, who give birth and who take most of the responsibility for raising children — but who, in large numbers and for various reasons, do not want the contraceptive technologies on offer or who feel that they need more children?

If Bill McCormick is genuinely interested in "restricting reproduction" and fears "rejection of contraceptive methods" (phrases which do not appear in Whose Common Future?), he might investigate the forces (including many so-called "family planning" programmes) which disempower women. As Whose Common Future? noted, "many women have more children than they would wish for", and "women in India, as elsewhere, have always sought ways to limit births, but the existence of these various incentives [to use contraceptives or be sterilized] would indicate that the methods on offer are not their method of choice". "Unwanted pregnancies and unwanted abortions can indicate not just a lack of contraceptive techniques but the powerlessness and missing self-determination of women."

Because the users of the contraceptives are not consulted nor included in the development of these methods, women are often subjected to ill-health, pain, impoverishment, humiliation and brutality, and thus shy away from health clinics. Because the issue of women's power and control over their lives and their bodies is neither recognized nor included in a meaningful way in most "population" discussions and programmes, statements about the planet's "overpopulation" and its effects are currently being used, by other political interests if not by the speakers themselves, to endorse something like a war.

Who Controls Population?

I was really amazed by your July/August 1992 issue, "Whose Common Future?" For many years, *The Ecologist* has understood the critical role overpopulation plays in making the Earth a far more impoverished and inhospitable place, for humanity and wild creatures and ecosystems. Now, are we to assume this understanding has been tossed out with the bath water, and you have adopted the antique marxist "Overpopulation is a Myth" party line?

First of all, in the entire issue there is almost no mention of non-human life forms or larger ecosystems except as they relate to strictly human social problems of production, distribution, etc. Not that these aren't valid concerns, but one might imagine a periodical with the name *The Ecologist* might at least give non-human nature a minor seat at the table. The word "one-dimensional" comes to mind.

It gets even worse when it comes to the section on the "population control industries" (said with the lip curled in a sneer). Why, on page 184 we are enlightened to the fact that overpopulation is not really an issue at all, it is "underpopulation" that plagues many parts of the planet today. There seems to be an absolute horror that reproduction might be "restricted" in any way (perish the thought!) Women need to "reclaim their reproductive powers" and "reject contraceptive methods" whenever and wherever possible. An uninformed person might come to the conclusion that the Earth is rapidly depopulating, pretty soon there won't be any of us left!

Well, as both you and I know, this is hardly the case. The human population of the planet is still increasing at something like 95 million per year. That's more than another United States worth of people every

Flooding in Bangladesh

I read the article by Peter Custers, "Banking on a Flood-Free Future? Flood mismanagement in Bangladesh" (*The Ecologist*, Sept/Oct 1992) with considerable interest. Most of the sentiments expressed in his article have my wholehearted support. I doubt, however, whether land reforms could provide more than a partial answer to the threat from cyclones. The landless who move to the *char* lands probably never could be protected, if for no other reason than that the *chars* are transient in nature. The problem of landlessness itself may owe much to human greed and illegally large land-holdings but one cannot disregard the inherent problem of land division by inheritance. The resultant minute farms are unviable and, so, are sold, leaving the inheritor landless. Similarly, the excessive population of Bangladesh and the high birth-rate act against any real solution.

During my time in Bangladesh, 1981-1983, I sought information on the source of the water which filled the *beels* (the quite enormous saucer shaped depressions which make up the floodplains). Despite several large-scale studies which were underway at that time, nobody could give me any definite answers. A fair consensus seemed to be that the great rivers contribute in two ways. First, there is the overflow of their water — which embankments might prevent. Second, during the monsoon Bangladesh itself receives around 2,400 mm of rain, with some 3,000 mm in peak years, and this is impounded by the rivers. Embankments simply would replace the rivers in this impounding process and flooding still would occur. Even worse, being permanent, embankments would prevent natural drainage as the river levels fall in the autumn. Apart from the disruption this would cause to the complex pattern of the present crucial subsistence crop, deepwater rice, the consequent waterlogging would prevent the winter cultivation of numerous vital crops (such as mustard, onion, water melon, potatoes). All the crops would suffer if inflow of river water was prevented because of the dramatic loss of the vast quantities of silt which annually replenish soil fertility in much of the floodplains. Studies of silt deposition and agronomic studies show patterns which support this consensus.

The section titled "Adapting to the

Floods" does an injustice to the farmers and to their traditional deepwater rice crop. It is not a matter of "adapting" — that was done thousands of years ago. Mention of 10,000 different varieties of "wild rice" is misleading. The deepwater rice may well be the progenitor of most modern rice varieties but it certainly is not wild. A very high degree of sophistication is shown in the careful selection of cultivars for specific depths of flooding and specific periods of flooding. There is no need whatever for fencing (other than to keep the water hyacinth, a serious floating weed, out of rice fields) nor for planting of natural grasses, canes and trees. In fact, interference in the natural pattern of rice cultivation has come from irrigation during the dry winter season (the end result of other donor activity). Increasingly, the farmers are turning to the ostensibly higher yielding winter, *boro*, rice but the *boro* harvest comes too late for the sowing of deepwater rice. Thus, the **only** possible summer crop is being lost. Furthermore, the enlarging area of *boro* means disappearance of the normal winter break in rice cultivation and the consequent year-round presence of rice in the floodplains is leading to major increases in pest and disease populations. The empty *boro* fields leave gaps in *beels* which otherwise would be completely filled with deepwater rice; in windy conditions these gaps allow waves to build up so as to do severe damage to the deepwater rice. Incidentally, deepwater rice also is the major subsistence crop of the floodplains of Thailand, West Bengal, Assam, Indonesia and Vietnam.

The "aid and consultancy" game frequently comes in for severe and, in some instances, justified criticism. There are many who pursue careers in it and do their work conscientiously and effectively. Regrettably, from my own twenty-three years' experience, it is the headquarters staff of aid agencies who "decide" what the results of research projects mean. Years of hard-gained field experience (indigenous and expatriate) commonly are ignored; preference being given to the reports of "Evaluation Missions" staffed by "experts" who usually come from Western institutions and commonly have never lived nor worked in developing countries.

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Mad Cow Disease

Further to my article in *The Ecologist* (March/April 1992), I would like to update my observations and research into the hypothesis that chronic exposure to organo-phosphate (OP) pesticides is switching on susceptibility in cattle to the so-called infective "prion" agent which causes bovine spongiform encephalopathy (BSE) or "mad cow disease" (agents which have existed in "scrapie" form as innocuous, endemic contaminants of the bovine environment for centuries).

Now that more than 300 BSE positive cattle, which were officially declared as "born after the (July 1988) ban" (BABS) on animal protein being incorporated into cow concentrate feed, have been slaughtered, it would seem that the time is ripe for the Ministry of Agriculture, Food and Fisheries (MAFF) to start entertaining alternative hypotheses as to the cause of BSE, particularly as their researchers have recently "explained away" the BABS phenomena by categorising it as a totally novel disease, despite the cattle displaying outward symptoms identical to those of BSE.

Many of these BABS cattle were born of mothers who had never exhibited symptoms of BSE nor had consumed brands of fishmeal, protein blocks or home-mix protein pellets that contained the infected animal protein ingredient. (Likewise BSE's human equivalent, Creutzfeldt Jacob disease, has occurred in lifelong vegetarians.) Many observations of the BSE phenomena, therefore, point to an environmental trigger which is switching on the BSE syndrome. In Jersey, a herd of 30 cows was sold to a dealer on the island; of the sixteen cows that remained on Jersey, fourteen developed BSE, whilst the rest of the herd, which was exported to South America, remained BSE free. What environmental trigger was present on Jersey and absent in South America?

In the winter of 1991/2, my whole organic dairy herd was temporarily removed onto a chemically managed farm because I was in danger of exceeding my annual milk quota. When the herd returned in April 1992, I immediately noticed that two cows, Damson and Mustard, were switched on to the initial symptoms of BSE. Both of these cows had been purchased into my organic farm from the same chemically-run farm as our previous BSE victim.

Magnesium sulphate was administered

to the BSE suspect cows, inducing a complete recovery as far as Mustard was concerned, whilst Damson remitted for about one month before the symptoms appeared again. Magnesium sulphate is a conventionally accepted antidote to OP poisoning in cattle.

To challenge the OP hypothesis further, on 6 May, 1992 I took blood samples via my vet from the BSE suspect, Damson, and from three healthy control cows that all shared identical management practises, were approximately five years old and were not pregnant. The blood was screened at the Department of Chemical Pathology at Leeds University for a range of liver and muscle enzymes, minerals and vitamins relevant in the search for any OP-related trigger factor. All the cows had virtually constant levels for most elements screened, except that in Damson "red cell cholinesterase" levels were depressed and calcium was below the bovine reference range level.

As acute exposures to OP are well known to depress levels of plasma and red blood cell cholinesterases (the latter for as long as two months after the exposure incident) and to disrupt normal calcium metabolism, it seems likely that Damson was either genetically predisposed to lower red cell cholinesterase and calcium levels, or was recovering from an exposure to OP encountered during her winter stay on the chemically managed farm. A more wide-scale research programme should be launched into this area, and blood and urine from BSE cattle should be monitored in search of metabolites of the OP chemicals which commonly pervade the bovine food chain.

Prior to the MAFF vets slaughtering Damson on 21 July, 1992, I was able to treat her with the first of a three month course of pioneering injections containing 2-pralidoxime and atropine, a specifically tailored antidote drug for reactivating the cholinesterases in the central and peripheral nerves following acute and chronic exposures to neurodegenerating OP insecticides and nerve gases.

Apart from some initial temporary side effects caused by mild atropine poisoning, Damson's mad cow symptoms remitted 90 minutes after our vet administered the injection: all paranoid schizophrenic, ataxic, hypersensitivity to sound and touch, eye and ear twitching, fear of handling symptoms abated and Damson regained her herding instincts for the first time in six weeks.

We were left with a cow who was mus-

cle wasted and weak in the legs, finding it hard to rise up. Our vet also observed what he described as a possible degeneration of the bone on the offside of Damson's pelvis. (This condition, plus many other of the classic BSE symptoms, were reported by a Mrs Enfy's Chapman of Royston, Hertfordshire, UK whose entire herd of cows were accidentally sprayed by an aerial sprayer emitting the OP, Hostathion). OPs overdrive the parathyroid gland which theoretically could account for such bone deterioration.

Despite such a positive response in Damson's condition, the various vets presiding over Damson's case required a second expert opinion on whether the therapy should continue or not. The experts responded, albeit in no clear-cut terms, six days after the first injection; four days is the correct time to re-inject the oxime. On the fifth day after the first injection, symptoms of ataxia, stilted walking, and hypersensitivity returned, and with the additional problems of bad weather, Damson was unable to rise up. On welfare grounds she was slaughtered, proving to be "BSE positive" at post mortem.

Medical literature reports that other spongiform encephalopathies such as scrapie and Creutzfeldt Jacob disease have been induced solely through exposure to chemicals which act like OPs. I have already demonstrated some epidemiological correlation between zones where OP warble fly treatments were compulsorily used in Britain and where BSE incidence rates were at their highest. The same types of OP insecticides are used in other contexts that contribute to the chronic toxic load of OP accumulating in the bovine food chain. This is well illustrated by a sudden epidemic that occurred in 1990 among pigs in north-east England where some 800 sows had to be slaughtered after developing neurological problems culminating in paralysis, due to wheat in their concentrate feed that had been treated with the grain store insecticide, Isophenfos, which left unpredictably high residue levels.

MAFF reported in 1984 significant OP residue levels in concentrated cow feed. Ingredients of cowcake, such as oil seed rape, soya, cotton cake, ground nut and citrus pulp are notorious for causing pesticide residues in feed stuffs; citrus pulp is incorporated into the brands of cattle cake associated with BSE infected herds, but absent in brands that produce a relatively negligible incidence of BSE.

As OP treated, plant-derived protein has largely replaced the input in cowcake of animal-derived protein used before the July 1988 ban, this alone could account for the increasing incidence of BSE since the ban.

Worming pills containing OP insecticides are another source of exposure, being routinely implanted into the rumen (first stomach) of cattle on some farms. These implants shed one OP tablet into the gut every three weeks over a four month period. Chronic low level exposure of the intestinal membranes to the OP, Malathion, has been demonstrated to facilitate the entry of large molecule "alien" proteins, such as "prions", into the bloodstream and internal environment of the mammal. This could account for one aspect of physiological susceptibility to the BSE agent, whilst other criteria are linked to an acceleration of the neurotransmitter, serotonin, switching on the active degenerative phase of BSE.

BSE shares many similar biochemical anomalies to myalgic encephomyelitis (ME) in humans. Both conditions could reflect chronic poisoning involving different combinations of opportunist viral/prion infestations that have been able to capitalise on a weakened mammalian system whose immune defences have become gradually depleted through chronic daily exposure to residual chemicals in the food chains. ME and chronic OP poisoning share identical outward and pathological symptoms.

In the late 1980s Spanish toxic oil syndrome, several thousand people suffered grotesque neurological disturbances and/or died as a result of the alleged consumption of a toxic cooking oil, sold by a group of cowboy oil merchants. Two medical researchers, however, discovered that far from all victims of the syndrome had consumed the oil, but all had eaten tomatoes or cucumbers grown at one specific nursery where a type of OP insecticide had been used. Could not the politics of this toxic oil syndrome be analogous to the BSE epidemic where the "small fry", publicly scorned "renderers" are the scapegoats for what is truly the blame of the mega-multinational chemical companies?

Mark Purdey

High Barn Farm, Elworthy
Lydeard St Lawrence
Taunton, Somerset, UK.

A full, referenced copy of this letter is available from the editorial office.

Mount Nimba Threatened by EC Subsidies

A giant open-cast iron ore mine, similar to that at Carajas in Brazil, threatens Mount Nimba, a UNESCO-designated World Heritage site in Guinea. An international consortium of mining companies, NIMCO, is planning to exploit the world's largest untapped iron ore reserves, estimated at one thousand million tons.

ASSOANE, a Guinean group, is concerned that the mining project would threaten the exceptional richness of the area and, by altering rainfall patterns, affect crop production in Guinea and Northern Liberia. Mining would also affect the part of the Mount Nimba reserve in Cote d'Ivoire.

The mining would bring only 600 low-paid jobs to Guinea, and the financial viability of the project is questionable. EUROFER, the European consortium that would be the major ore purchaser, is currently lobbying the EC for subsidies due to oversupply in the steel industry.

The World Bank, due partly to international pressure, has refused to participate in this project and has recommended to the government of Guinea that an independent economic and environmental evaluation be carried out before a decision is taken.

ASSOANE has appealed to NGOs and environmental organizations throughout the world to help conserve Mount Nimba rather than exploit it.

Please write to the European Commission (address below) asking that public funds are not used to destroy this World Heritage Site and the natural resource base which supports tens of thousands of local people. While EUROFER plans to buy iron ore from Mount Nimba, any EC subsidies to them will further the destruction of the mountain. Please mention your support for future international initiatives which will seek to protect the World Heritage listed mountain in close consultation with and for the benefit of the local communities.

• Mr Martin Bangemann, Commissioner, The European Commission, DG III /Internal market and Industry, Rue de la Loi 200, B-1049 Bruxelles, BELGIUM

Please also send copies of your letters to:

• Korinna Horta, EDF, 1875 Connecticut Ave., N.W., Washington DC, USA to receive updates on the campaign.

Stop The Brazilian Mahogany Trade

Over 60 Brazilian groups, representing rural workers, indigenous peoples, forest extractivists and environmentalists, are calling on their government to place a moratorium on mahogany cutting. Since tax subsidies for cattle ranching were halted, the building of roads to extract mahogany is the biggest factor opening up new areas of intact forest to exploitation.

The groups' manifesto against predatory logging states that "Most of the mahogany extracted in Brazil is taken from the territories of indigenous peoples". Indigenous people are cheated and murdered by logging companies and subjected to increased disease and disruption.

Last November, representatives of Greenpeace Brazil and the rural workers' union chained themselves to machinery at a Pará sawmill belonging to Maginco, the country's biggest mahogany trader, closing down the plant. The police did not intervene, possibly because of the large press contingent, and the protest was broadcast across Latin America.

The Brazilian coalition has requested support from consuming countries to reduce demand for mahogany, which is used to make products from toilet seats to boardroom tables. Responding to this request with tactics such as store pickets, boycotts and direct action, Northern environmental groups coordinated by Greenpeace International aim to broaden awareness of the impacts of buying mahogany and to force companies to stop importing it. People with campaigning experience or enthusiasm or knowledge of forestry, the wood trade, or Brazil are urgently needed to assist this campaign.

The largest British "Do It Yourself" retailer has agreed not to buy Brazilian mahogany after April 1993. Other UK timber firms, however, have not followed suit, and Britain continues to import over half of Brazil's mahogany exports.

Please write to the President of Brazil — Ifamar Franco, Presidente, Palaciode Alvorado, Brasilia DF 7500, BRAZIL — supporting the demands of the Brazilian groups and the State Government of Para for a moratorium on mahogany logging. For more information, please contact:

• *Britain:* George Marshall, London Rainforest Action Group 166 Whitecross St., London EC1Y 8QN Tel. 071-251 8973 E-Mail gn:gmarshall

• *Other countries:* Your national Greenpeace Office.

Land Rights on Mount Apo in Mindanao

Mount Apo in Mindanao is the highest mountain in the Philippines, the ancestral land of over 450,000 tribal Filipinos (Lumads) and a National Park. However, the Philippines National Oil Company (PNOC), despite five years of controversy and strong local opposition, has been given permission to build a geothermal power plant and has already begun road-building and drilling rig installation.

For the Lumads, the area is sacred. Further drilling will displace indigenous people, open the area to lowland settlers, drive away game, pollute water supplies over a wide area and increase the incidence of disease. Low-level earthquakes and eruptions may also be precipitated, such as those which shook Mount Apo in February 1992. The electricity generated by the project would supply industrial and urban areas rather than the Kidapawan area, which PNOC has claimed would benefit. The project would also add to the national debt which accounts for over 42% of national government expenditure.

Resistance to the project is longstanding, "generating insurgency rather than energy" in the words of Bishop Pueblos de Los Dios. Nine tribes have made a blood pact to defend Mount Apo. In 1988 the strength of the opposition persuaded the Department of the Environment and Natural Resources (DENR) to declare the project "patently illegal". In January 1992, however, the DENR granted PNOC clearance to continue work. Critics charge that PNOC is in violation of the conditions under which the clearance was granted, but the courts have not acted — despite applications.

The government is arming a paramilitary force in the area and forcibly evacuating people. Military officials have closed the National Park to visitors, stating that guerrillas may attack. The military and PNOC are reported to have been bribing tribals outside the park to support the project. Two Manobos have been killed because of their outspoken opposition and many others have been threatened.

A growing coalition of groups in the Philippines, led by the Lumads, has asked for international support to oppose the project. A major focus of their campaign is to pressure the Japan Import-Export Bank, which is considering a \$220 million loan for the Mount Apo plants. The Bank has said that "so long as [the local people]

oppose it we would never provide finance for the project". Nonetheless, despite clear evidence that opposition has not abated, the Import-Export Bank has refused to rule out its future involvement.

Please write to Philippines Government, calling for a halt to the project, an end to human rights abuses, respect for the rights of the local people and full protection for Mount Apo as a national park:

- President Fidel V. Ramos, Malacanang, Manila, PHILIPPINES;
- The Honourable Senator Neptali Gonzalez, Senate President, Room 407, Executive House, P Burgos Drive, Ermita, Manila, PHILIPPINES;
- Secretary Angel Alcala, Department of the Environment and Natural Resources, Visayas Avenue, Diliman, Quezon City, PHILIPPINES.

Please also write to express support to the three main local peoples' groups (Alnhamad, SKS, and SBM) which are fighting the project:

- Task Force Apo Sandawa, c/o Bishop's Residence, Balindong, Kidapawan, South Cotabato, Mindanao, PHILIPPINES

Please write to the Japan Import-Export Bank to demand that they should not fund this project which is so bitterly opposed by the local people. The Bank is already concerned about the level of international protest over these loans which would be in the form of supplier credits to Japanese companies, including Mitsubishi, Toshiba and Fuji:

- Masaki Horiguchi, Director General, Loan Department 1, The Import-Export Bank Of Japan, 4-1 Ohtemachi 1-Chome, Tokyo, Japan. Fax: +81 (3) 3287-9539

For more details about Mount Apo, write to:

- Geoff Nettleton, Philippine Resource Centre, 84 Long Lane, London SE1 4AU, U.K. Tel: +44 (71) 378 0296, Fax: +44 (71) 403 3997.

decision, however, three incidents involving serious human rights abuses have occurred — all of them resulting from locals posing difficult questions during the "consultation" process. At Omkareshwar, in Madhya Pradesh, 123 people seeking to attend a meeting with senior politicians were arrested without charge, apparently after being recognized by the Police as members of the anti-dam Narmada Bachao Andolan (NBA). They were held for six days, the first two without food, and without seeing a magistrate. The meeting had been billed as an "infomation camp" where people could question officials about resettlement.

Please follow up on letters to the officials and politicians listed in *The Ecologist*, Vol 22, No.6. The following points are particularly important:

- The Bank benchmarks are vague, and open to subjective assessment;
- The benchmarks should be independently monitored;
- In all 3 project affected States the issues of the availability of land, fuelwood, fodder, drinking water, forests and water have not been settled;
- Construction should therefore be stopped as satisfactory resettlement of the affected people is impossible.

IDA-10

Forty organizations from both North and South recently launched a campaign for substantial cuts in funding for the International Development Association (IDA). This is the branch of the World Bank which provides concessional loans to Bank shareholders whose per capita GNPs are US \$580 or less (in 1987 dollars) and is the largest official lender to such countries. IDA is being targeted as part of a wider effort to reduce World Bank funding and widen the debate on the quality of aid.

Since 1960, when IDA was established, there have been nine funding replenishments (IDA-1 to IDA-9). Concern over the adverse impact of IDA projects on local peoples and the environment led US groups to challenge the last replenishment of IDA (IDA-9). As a result, a number of reforms were written into the replenishment agreement, including the preparation of guidelines for projects affecting a number of sensitive ecosystems and the preparation of National Environmental Action Plans (NEAPs). Neither undertaking has been fulfilled.

The IDA-9 replenishment also required the Bank to make poverty reduction central to its funding priorities, but much of IDA's current portfolio is directed towards programmes that exacerbate, rather than alleviate, poverty.

In 1990, 30 per cent of IDA spending was for structural adjustment loans (SALs). Such loans have been used to cut public expenditure on health and education. Programmes to boost export agriculture have undermined food production for local consumption and damaged land and other natural resources.

IDA support for forestry programmes under the Tropical Forestry Action Plan has encouraged the development of commercial forestry at the expense of the poor. IDA funding has also supported road-building programmes that open up primary forests to logging companies.

IDA-funded dam projects, including Sardar Sarovar, have an appalling history of human rights violations, environmental destruction and mismanagement. Several have involved forcible resettlement.

IDA projects in the pipeline include the Xiaolangdi Dam in China, which will displace 190,000 people; two further loans (worth more than \$475 million) to Sardar Sarovar; mining loans to Tanzania and Bolivia; forestry loans to Equatorial Guinea, India and Laos; and pesticide loans to Senegal.

This campaign appeals to groups to pressure their legislators to reject the \$18 billion IDA-10 replenishment, now coming up for approval in national parliaments. International pressure has just prevented the Bank from gaining a proposed \$5 billion "Earth Increment". Under this vague programme, the Bank was to have increased its so-called "environmental" lending without addressing the impacts of its existing project portfolio.

The Bank is clearly on the defensive after the turbulent Board meeting on Sardar Sarovar and the leaking of the Wapenhans Report (*The Ecologist*, Vol 22, No 6). Threatening to reduce Bank funding now will apply real pressure to this otherwise unaccountable and intransigent institution.

• Write to your MP or equivalent representatives, urging them to oppose IDA replenishment.

• In Britain, request that MPs support Friends of the Earth's Early Day Motion (1092, 15th December 1992) opposing replenishment until there is greater World Bank accountability.

ECOLOGIST CAMPAIGNS

This new Campaigns section highlights on-going campaigns and identifies how readers can support them. Please send in material if you wish publicity for your campaigns. Write to: *The Ecologist*, Campaigns, Bath Road, Sturminster Newton, Dorset, DT10 1DU, UK.

Narmada Dams

The situation in the Narmada valley has not improved since the World Bank's decision in October to continue funding the Sardar Sarovar dam, albeit whilst laying down a number of "benchmarks" — all loosely worded — to be fulfilled by March (See *The Ecologist*, Vol 22, No 5 and Vol 22, No 6). Portraying Bank support as an endorsement of their record, the Indian authorities are using repressive measures, in the words of one activist, to "steamroll the people's legitimate opposition and feelings in an attempt to show the Bank that it is making 'satisfactory progress' and that the people are 'willing'".

One of the benchmarks laid down by the Bank is that local people should be adequately "consulted". Since the October

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MISCELLANEOUS

ENVIRONMENTAL BRIGADES TO NICARAGUA – the Nicaragua Solidarity Campaign and the Environmental Network for Nicaragua is sending brigades to support the work of agricultural co-operatives and environmental organisations; 4 weeks during July, August, December, January. Contact: NSC, Red Rose Club, 129 Seven Sisters Rd., London N7 7QG. Tel: 071 272 9619.

DIARY DATES

DEEB ECOLOGY'S most influential thinkers, Arne Naess and Bill Devall are joining forces to run a course on Deep Ecology and Ecophilosophy at Schumacher College in January 1993. Also taking part are ecofeminist writers Anne Primavesi and Elizabeth Dodson Grey. As well as discussions on the fundamentals of ecology, the course will contain guided experiences such as Joanna Macy and John Seed's 'Council for all Beings'. Further details from Hilary Nicholson, Schumacher College, The Old Postern, Dartington, Totnes, Devon TQ9 6EA, UK. Tel: (+44803) 865934, Fax: (+44803) 866899.

ENVIRONMENT DAY: 24 April 1993 as part of a celebration of the 900th anniversary of the dedication of Winchester Cathedral. The day will include an opening ceremony, numerous stalls and side-shows, workshops and demonstrations, street theatre and happenings. Jonathon Porritt and Prof James Lovelock will be attending. If you can contribute either by running one of the above entertainments or by advertising or attending etc. please write to David Knight at King Alfred's College of Higher Education, Sparkford Road, Winchester SO22 4NR or telephone on (0962) 841515

The Society of Chemical Industry (SCI) is organising the following one day symposia on January 20, 1993: WASTEWATER TREATMENT BY BIOLOGICAL AERATED FILTERS – LATEST DEVELOPMENTS held at the Cranfield Institute of Technology, Cranfield, UK. ENVIRONMENTAL AUDITING, who does them, why and how? Held at Belgrave Square, London, UK. For more details, tel: 071 235 3681 or fax: 071 823 1698.

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Wolfgang Sachs, The Development Dictionary. A Guide to Knowledge and Power. 306 pp, 1992, paperback £14.95.

Bharat Dogra, India, Despair and Hope. This book contains essays which stress the need for revising development concepts in India and outlines the steps to be taken. 1991, 366 pp, hardback £9.00.

International Directory of Non-Governmental Organisations. This dictionary is published by World Wise, a Grassroots Campaign for International Bank Reform. It lists over 1,800 active organisations on 320 pages. 1992. Institutions £45.00, Individuals £30.00.

Goldsmith and Hildyard, The Social and Environmental Effects of Large Dams, Volume III. A Review of the Literature has just been published. All three volumes available at Institution price £45.00 per volume and Individuals and Third World Institutions £30.00 per volume.

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