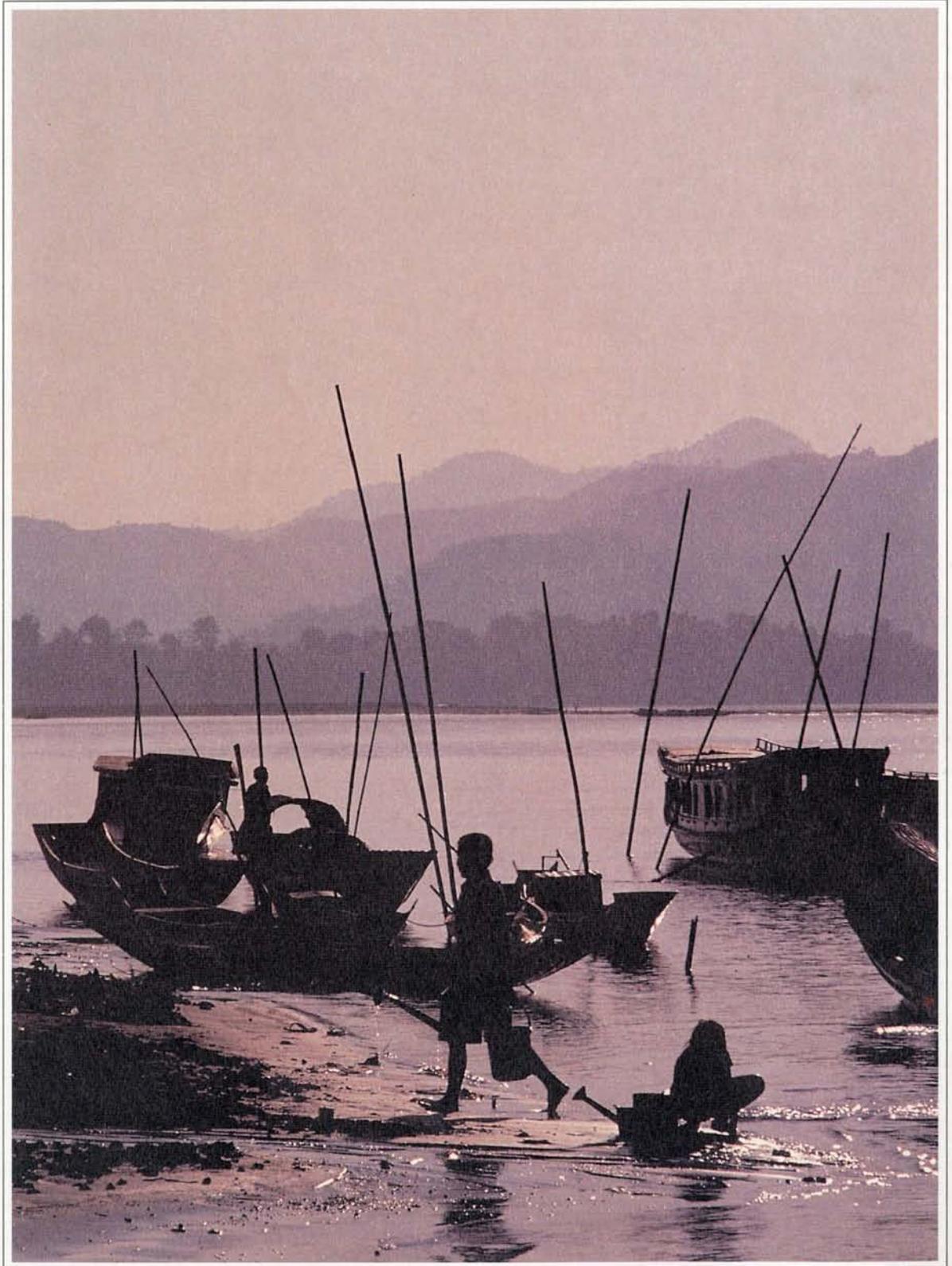


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Vol 26 No 3

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Subscriptions: The Ecologist, c/o Cissbury House, Furze View, Five Oaks Road, Slinfold, W. Sussex RH13 7RH, UK
Tel/Fax: (01403) 782644

Retail Distribution: Central Books, 99 Wallis Road, London E9 5LN, United Kingdom
Tel: (0181) 986 4854, Fax: (0181) 533 5821

Annual Subscription Rates

£24 (US\$35) for individuals and schools;

£50 (US\$90) for institutions;

£18 (US\$28) concessionary rate
(subscribers in the Third World and
Eastern Europe; unwaged—ID required).

Air mail £11 (US\$19) extra.

Concessionary rate only available from RED
Computing and The MIT Press and not through
other subscription agents.

The Ecologist is published bi-monthly. The rates
above are for six issues, including postage and
annual index.

Subscriptions outside North America payable to The
Ecologist and sent to the Subscriptions address
above. We welcome payment by UK£ cheque drawn
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The Ecologist is available on microfilm from University Microfilms International, 300 North Zeeb St., Ann Arbor, MI, USA

Advertising

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Inserts

Up to 265x185mm, not more than 10g each:
£45 per thousand, full run, plus VAT; £60 per
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editors.

The Ecologist International Serial Number
is: ISSN 0261-3131.

Printed by Penwell Ltd, Station Road, Kelly
Bray, Callington, Cornwall, PL17 8ER, UK.
Tel: (01579) 383777

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Editorial

Green and Compact Land 82

Simon Fairlie

Feature Articles

Damming the Theun River: Nordic Companies in Laos 85

Ann Danaiya Usher

Up to 60 new dams are planned in Laos. The first of these, Theun Hinboun, will be operated by a consortium which includes two Nordic state electricity utilities. NORAD, the Norwegian aid agency, admits that the environmental and social impact assessments for the dam were deeply flawed. Nonetheless, the project is steaming ahead. Governments and hydropower developers should not be allowed to wash their hands of the negative consequences of their dam building spree in Laos.

The Animal Heart of the Matter: Xenotransplantation and the Threat of New Diseases 93

Florianne Koechlin

With human organs for transplant operations in increasingly short supply, researchers are seeking to use genetically-engineered pigs as an alternative source of "body parts". Such "xenotransplantations" would greatly increase the risks of new diseases developing in humans. Opponents are calling for a freeze on research.

Cost-Benefit Analysis, Rationality and the Plurality of Values 98

John O'Neill

Cost-benefit analysis embodies a false conception of reason. It assumes that rational decision-making requires a common unit of value against which all objects or states of affairs can be ranked. But attempts to measure plural values against each other using a single yardstick lead to arbitrariness, contrivance and obstruction of the process of reasoned deliberation. Case-by-case practical judgement cannot be eliminated from the process of making rational choices.

Deforestation in Tanzania: Beyond Simplistic Generalizations 104

Solon L. Barraclough and Krishna B. Ghimire

The relationship between human numbers and deforestation is rarely as clear-cut as some policy makers insist. In one district of Tanzania, large population increases have led to more tree cover, whilst, in another, deforestation is widespread despite low population densities. Deforestation in Tanzania has been driven largely by market forces and state policies rather than by population growth.

Creeping Enclosure: Seed Legislation, Plant Breeders' Rights and Scottish Potatoes 110

Tracey Clunies-Ross

Thirty years after the UK introduced legislation to protect the rights of plant breeders, companies are beginning to use the legislation to exert their rights. Scottish seed potato growers are now being forced to grow certain varieties only under contract to the companies that hold the rights to the varieties. The case has significant implications for Southern farmers who have been assured that international agreements such as GATT will not restrict their ability to exchange farm-saved seeds and other reproductive materials.

Books 115

Encountering Development — The Unmanageable Consumer — Ecology and Equity in India — Women in Eastern Europe

Letters 120

Campaigns and Updates Centre Pages

Cover Photo: Mekong River in Laos (Jean-Léo DuGast/Panos Pictures)

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Green and Compact Land

On Sunday 5 May 1996, a motley convoy of coaches and vans, organized by the campaigning network, The Land is Ours, bundled through the gates of Gargoyle Wharf in Wandsworth, South London and set up an "Urban Land Occupation". Suddenly, the 13-acre Thames-side industrial site, which had lain derelict for seven years, was bustling with activity. Within 24 hours, an octagonal wood-framed meeting hall and a geodesic dome had sprouted amongst the budleia and poplar saplings, composting toilets had been erected and a truck-load of topsoil was being shovelled into garden beds raised above the level of the site's contaminated soil. About 1,000 people participated in the occupation: road protesters and allotment enthusiasts rubbed shoulders with senior representatives of mainstream conservation bodies and town planners as they worked together to build a shanty town maquette of the New Jerusalem.

It was not long before children from Dungeness House, the council block of flats across the street, were joining in, and in their wake came their parents, worried about their children crossing the road and curious about this bizarre new development beneath their windows. The campaigners and locals discussed what to build on the site and came to a unanimous conclusion. They did not want the supermarket

and up-market housing that the owner, Guinness, was proposing — there were already two large supermarkets and innumerable luxury residences in the neighbourhood — but rather affordable housing, small workshop facilities, a riverside park, a city farm . . . and less traffic. Within five days, a residents' group had formed and was becoming involved in the occupation.

The people of Wandsworth have lived for many years next to large tracts of inaccessible derelict land. In 1978, the year before Margaret Thatcher became Prime Minister, 74 per cent of the vacant land in the borough had been so for over five years. However, in the ensuing years, the Conservative government and borough council introduced a package of incentives to stimulate high impact development of that land. Now, the inhabitants of Dungeness House are hemmed in by post-modern luxury flats and offices, some of them as empty and unused as Gargoyle Wharf, while a huge roundabout spews an interminable stream of traffic past their doorstep. Affordable terraced housing has been demolished, as has the once flourishing city farm which now lies derelict awaiting similar treatment. As the residents are only too aware, development in Wandsworth has not been by the people and for the people, but by developers and for developers.

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Compact Cities

Tracts of derelict urban land such as Gargoyle Wharf are likely to become much more scarce in coming years. Received wisdom today dictates that cities need to become greener and more compact. The European Commission, the government and lobby groups such as Friends of the Earth and the Campaign for the Protection of Rural England (CPRE) are all agreed that urban environments should be made more attractive in order to stem the process of counter-urbanization — the tendency for prosperous and mobile city-dwellers and urban-based businesses to move to rural areas, increasing the demand for car-based development in the countryside. "We need to debunk the rural image," states Duncan McLaren of Friends of the Earth "and ensure that those returning to our higher density urban areas outweigh those leaving". The Town and Country Planning Association, on the other hand, has voiced reservations about "town cramming", with reminders that there are limits to the extent to which cities can be made both green and compact.

The need for urban regeneration has become more pressing with the publication of the government's latest projections of future housing demand in Britain. The Department of the Environment now estimates that 4.4 million new dwellings will need to be built over the next 20 years, an increase of 20 per cent over the present housing stock. Half of these are to be constructed on "brownfield sites" in urban areas — sites like Gargoyle Wharf. The other 2.2 million are to be constructed on "greenfield sites" in rural areas.

According to the government, these projections reflect demand, not from population growth (which is relatively low), but from the fragmentation of nuclear families — a curious prediction from a government ostensibly committed

to preserving family life. There is a growing suspicion among CPRE and other commentators that just as the building of roads generates more traffic, so the building of houses generates the formation of more households, and that therefore the government's household projections may be "self-fulfilling prophecies". Obviously, this is true in the sense that if the 4.4 million dwellings are not built, then people will not move into them. But as long as the morality of unlimited economic growth in the housing sector remains unquestioned, CPRE's concerns about household generation are likely to be viewed as academic. No environmental organization is brazen enough to suggest (as Edward Goldsmith did in this magazine in 1973) that people in Britain might consider making do with less personal space in the interests of protecting the environment from housing development. All kinds of bodies, including the government and the Automobile Association, are happy to encourage people to get out of their cars and use more public transport or walk. But there is little pressure from any quarter to stem the demand for new housing, for example, by facilitating the formation of shared households by young adults, by encouraging older people living alone in capacious houses to share them, or by discouraging second homes.



Alex MacNaughton

Betterment

The requirement for another 4.4 million homes is, of course, welcome news to the construction and development industry, which stands to make vast profits through the increase in value that occurs when land acquires development rights. This appreciation is known as "betterment". When agricultural land receives planning permission for residential development, its value rises from about £2,000 per acre to £200,000 per acre or more. When derelict city land acquires planning permission for housing (or even better, a supermarket), it too increases in value, though not by such grotesque proportions. (Because city land is scarce, it tends to appreciate in value anyway, whether or not it has development rights.)

Betterment involves a transfer of wealth from one section of society to another. The beneficiaries are landowners, speculators and developers who acquire planning permission for land bought cheaply as well as the banks, building societies and other investors who lend money on that basis, and other parties such as estate agents and insurers whose income is related to the value of property. Betterment is paid for by the person who buys or rents the property — in the case of dwelling houses, this means ordinary members of the public. Often the value of the development rights will equal or nearly equal the value of the house plus the value of the land. Many home-buyers have enough capital to pay for the building and land costs, but have to obtain a mortgage to pay off the development rights costs.

The exact amount of this transfer of wealth can only be guessed at but it is extremely large. If the 2.2 million houses that the government anticipates will be built outside urban areas in the next 20 years involve an average increase in land value of £25,000 per house, the total profit from betterment will be £55 billion. To this sum can be added any increase in land value occasioned by the building of another anticipated 2.2 million new homes in urban areas; and the increase occasioned by the construction of commercial buildings on greenfield sites and in cities. All this is betterment arising from future development. On top of it should be added all the interest payments paid by mortgage holders on the artificially-high land value of their existing homes, be they first- or second-hand.

Positive Planning

Quite apart from the obvious issues of equity and affordability, betterment presents another major problem. Development is driven, not by social needs, but by the market — by the opportunity to make a profit in a milieu where millions of pounds hinge upon a single planning decision. The failure of the market to provide sensible, affordable and environmentally-sustainable facilities is abundantly clear to the people of Dungeness House as they gaze out over the congested street below at empty blocks of offices and half-empty blocks of luxury flats.

The architects of the 1947 Town and Country Planning Act, which introduced planning permission in Britain, were only too aware of these problems. The Labour government at the time hoped to divert the unearned increase in value from betterment to the state, so that the money could be ploughed into socially-useful development, a process known as "positive planning". The 1947 Act contained a 100 per cent "development charge" which was to levy from the developer the difference between the original use-value of the land and the new development value of the land. But this levy was abolished by the Conservatives in 1954. In a 1965 White Paper, another Labour government wrote: "It is wrong that planning decisions about land should so often result in the realizing of unearned increment by the owners of the land to which they apply", and the 1967 Land Commission

introduced a new betterment levy, this time of 40 per cent. This was again abolished by the Conservatives in 1971. Today, profits from development are taxed only at the standard rates of income tax and capital gains tax.

Many planners, disillusioned by their inability to control speculation or to direct development in socially-useful directions, would like to see some kind of betterment levy reintroduced. James Redwood, Director of Planning and Technical Services on Lewes district council, faced with local villagers who are irate that they are to be swamped with new housing, argues that:

"Putting a system of betterment in place would act on the planning process in a number of complementary ways. In the first place, communities would be essentially less antagonistic to development, as the motivation for development would be less market-driven. Secondly, the value of any development would go back to the community to enable it to plan positively for itself . . . In properly-controlled environmentally-taxed circumstances, this could lead to more efficient ways of tackling such issues as housing shortages. There is no shortage of housing accommodation for those in need but in the face of easier options the market fails to bring it forward and the planning system acquiesces".

Without any doubt, a well-targeted betterment levy would help to eliminate the worst excesses of speculative development and give planning departments greater muscle. Whether it would enable the community to "plan positively for itself" is another matter. District council officers are not "the community": they can be susceptible to vested interests and even though they may be motivated by paternalistic concern rather than profit, they have shown themselves quite capable of indulging in development schemes that range from the inap-

propriate to the megalomaniac. Positive planning may be development *for* the people, but it is not development *by* the people.

Arcadia for All

What, then, is development by the people? Can it exist? What precisely are the occupiers of Gargoyle Wharf aiming to achieve, beyond a moment's embarrassment for Guinness and Wandsworth borough council? To comprehend the power and ingenuity of people-based development, there is no better model than the plotlands — those small tracts of land (described by Dennis Hardy and Colin Ward in their book *Arcadia for All*) which low-income city-dwellers bought during the agricultural depression, from the turn of the century until 1939, "to build their dream home, chicken farm, holiday shack or chalet". The plotlands that survive today provide attractive and sound homespun residences within a self-supporting community. Some have been declared nature reserves or conservation areas. One of them, Holtsfield near Swansea, was described by *Perspectives on Architecture* as "the perfect example of community architecture in action" and "a model for a more sensitive, socially responsible way of developing the countryside." Unfortunately, the residents of Holtsfield are currently threatened with eviction by a developer seeking to build a private housing estate.

There are many ways that the spirit of the plotlands can be revived to provide a sensitive, socially responsible way of developing both the countryside and the inner city. Licence could be given to homeless people and local residents to occupy and restore derelict properties. Land could be allocated in local plans for people to build their own houses or workplaces at a fraction of the cost of properties on the market. "Planning for Real" sessions, where local people plot on a model how they would like their community to develop, could be incorporated into the planning process. Communities could be given greater rights to decide how many new houses they consider their neighbourhood can absorb, and what kind of housing is needed, rather than having a quota imposed from on high. And new rural housing could be permitted outside the development zone if it conformed to strict criteria concerning environmental impact and sustainability. A relaxation of zoning restrictions for low impact housing would reduce the price of building land, dissolve the problem of betterment and make housing of this kind affordable.

These and other similar approaches offer the best prospects for building green and accessible urban communities which might persuade people to remain in the city; and the best prospects for accommodating people in the countryside in a way that enhances the rural environment. The role of planners in such projects is not to impose from the top down, but to encourage and facilitate; and to introduce the safeguards necessary to ensure that these projects do not get subverted by speculators and the development industry.

Simon Fairlie

Simon Fairlie is an Associate Editor of *The Ecologist* and author of *Low Impact Development: Planning and People in a Sustainable Countryside*, Jon Carpenter, to be published summer 1996.

Sources: McLaren D., *Counter-Urbanization: How Do We Achieve a Trend Breach?* Friends of the Earth Trust, no date; Bramley, G., and Watkins, C., *Circular Projections*, CPRE 1995; Redwood, J., "Betterment Makes Sense for Communities in the Firing Line", *Planning* 1126, 7 July 1995; Hardy, D. and Ward, C., *Arcadia for All: the Legacy of a Makeshift Landscape*, Mansell, 1984.

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Damming the Theun River

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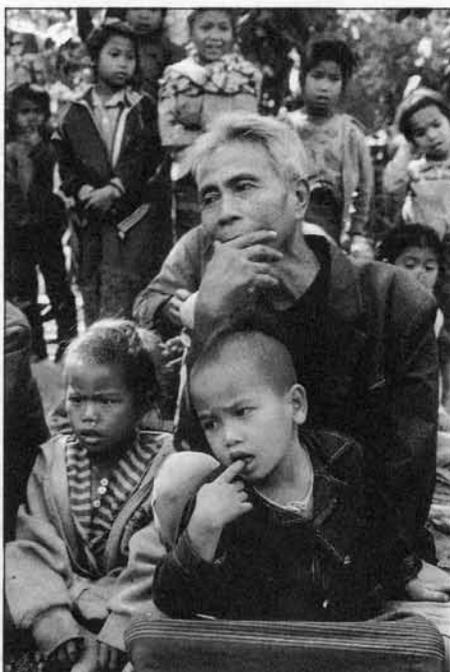
Ann Danaiya Usher

Prevented by public opposition from building new dams in their own countries, Nordic construction and electricity companies are looking abroad for new hydroelectric projects. Laos is a favoured destination because the country is considering building dozens of new dams, primarily to export electricity. The first of these, Theun Hinboun, now under construction, has been partly financed by Nordic companies and aid agencies. The environmental and social impacts of Theun Hinboun are likely to be extensive, but have been vastly underestimated by Norwegian consultants. There are few safe forums in Laos in which to challenge the new dams, but exports of hydrotechnology are being questioned within Norway and Sweden.

Across the landlocked, mountainous country of Laos run countless rivers and streams, most of which are part of the Mekong river's watershed. After years of war and isolation from Western capital, the communist government opened this small South-East Asian country up to the global economy in the mid-1980s and hydropower has emerged as its most saleable commodity. "With its small population, dramatic topographical mix of high and low lands and strong-handed government," commented the *Bangkok Post*, "Laos is seen as a near perfect dam land"¹ which could become the "Kuwait of Asia".²

The Lao Ministry of Industry and Handicrafts is now considering up to 60 dam projects. Construction of the first of these, the 210-megawatt Theun Hinboun, started towards the end of 1994 and the dam is scheduled to begin operation in 1998. The 25-metre-high dam is being built some 100 kilometres upstream of the mouth of the Theun river, the Mekong's fourth largest tributary. It will divert 100 cubic metres of water per second — almost one quarter of the Theun's annual average and double the present dry season flow — to a power station and then through a four-kilometre canal to a tributary of the Hinboun river which flows into the Mekong. As a result, a 40-kilometre stretch of the Theun river above the Mouan tributary will dry out; upstream, the reservoir behind the dam will extend 24 kilometres along the Theun river and 14 kilometres along the Theun's principal tributary, the Gnouang river.

The Theun watershed encompasses nearly 15,000 square kilometres of forested mountains and river valleys. These are dotted with rice-growing villages of some 100 or 200 people,



Villagers from Boua Ma, a village close to the Theun river.

who harvest much of their daily necessities from the forests and streams. An estimated 25 villages close to the Theun and Hinboun rivers — more than 5,000 people, who have never been informed, much less consulted, about the project³ — may lose their seasonal agricultural land and rich fisheries and may therefore have to move. Only \$1 million has been allocated for compensation.

The dam will also have a profound affect on the rich local flora and fauna. The Theun river basin contains one of South-East Asia's most important forest areas with a wide diversity of habitat types and wildlife, including elephants, peafowl, clouded leopards and various primates. The portion of the river that will dry out has been described as one of the country's least disturbed rivers from a wildlife conservation point of view.⁴ A 1992 study estimates that there are more than 100 species of fish in the rivers, streams and swamps of the project area.⁵

A BOOT Dam

Although Theun Hinboun has been described as a relatively small project in comparison with some of the other dams in the pipeline for Laos and the Mekong river (see Box, pp.88, 90), it will be the largest infrastructure project in Laos, doubling the country's installed electricity generating capacity. Unlike previous dams in the Third World which have been built largely with public money from development aid budgets, Theun Hinboun is being partially financed by the private sector as a "build, own, operate and transfer", or BOOT, scheme.

Under such schemes, groups of investors (which may or may not include the national government) agree to finance and construct a dam and then run it for some 20 to 30 years, selling the electricity and taking their share of the revenue at an agreed rate. After the allotted time period, they renegotiate the

Ann Danaiya Usher, a former environment writer for *The Nation* in Bangkok, is now Stockholm correspondent for *Development Today* and editor of *Dams As Aid: A Political Anatomy of Nordic Development Thinking*, Routledge, London (forthcoming 1997).

agreement or transfer the dam to the national government. The World Bank has endorsed the BOOT concept since 1989 in the name of increased efficiency.⁶

Under an agreement running for 30 years, the \$280 million dam will be owned by the Theun Hinboun Power Company, a joint venture comprising:

- *Électricité du Laos*, the state utility, which has a 60 per share;
- MDX Public Company, a Thai property company now diversifying into infrastructure investments, which has a 20 per cent share; and
- Nordic Hydropower which has a 20 per cent share. This is a consortium dominated by the two largest, government-owned Nordic power utilities — the Swedish state electricity utility, Vattenfall, and its Norwegian counterpart, Statkraft.⁷

As with most dams proposed for Laos today, the electricity generated by Theun Hinboun will be sold across the border to the Electricity Generating Authority of Thailand (EGAT) via a 230 kilovolt transmission line 190 kilometres in length. Nonetheless, it has been estimated that Theun Hinboun will generate up to 1,600 gigawatt-hours (GWh) per year⁸ which, at the sale price of 4.3 US cents per kilowatt-hour, amounts to an annual revenue of \$68.8 million.

Électricité du Laos's annual share would be some US\$25 million in dividends, royalties and taxes (after paying out US\$5 million per year to service the debt to the Asian Development Bank, which provided a \$60 million loan to the Lao government for the dam).⁹ According to Gunnar Wallin of Vattenfall, the Swedish company expects to make an average annual profit of \$1.8-1.9 million over the 30-year contract period.¹⁰

Nordic Utilities Venture Abroad

Theun Hinboun will be the first dam that either Vattenfall or Statkraft has built outside Sweden and Norway. Although both companies have concentrated on their domestic markets, widespread public resistance to dams in Sweden and Norway has stopped construction of all but the smallest projects at home.¹¹ Sweden's 1987 Natural Resources Act prohibits any hydropower exploitation of the country's last four free-flowing rivers — the Torne, Kalix, Pite and Vindel. In Norway, after a bitter struggle in the early 1980s, the Alta dam in the north of the country was eventually built on condition that it would be the last of its kind. Indeed, Alta has become a "unit of measurement, so that today when Norwegian politicians are considering a controversial project, they ask if it is worth another Alta".¹²

Thus as the home market shrinks, the Nordic dams industry, like its counterparts elsewhere, has had to find sites in the Third World to keep itself going. Vattenfall's Senior Manager, Karl-Erik Norlander, believes that Theun Hinboun represents a natural evolution for Swedish dam builders: "There are very few new projects in Sweden and Norway. But still we need professionals in the field, so we go abroad to find possibilities to use our skills."¹³

Connections with Laos

Nordic Hydropower was one outcome of this quest for "new possibilities". Formed in 1993 to implement the Theun Hinboun project, the consortium is one of the largest hydro companies in

the world, with a combined 17,000 megawatts of installed power.¹⁴ The choice of Laos as the site of Vattenfall's and Statkraft's first international venture reflects two major considerations: firstly, a desire to capitalize on Laos's drive to exploit its hydropower potential; and secondly, a recognition that the favourable light in which many Laotians view Sweden gives the consortium a "comparative advantage" over other companies.

During the 1960s and 1970s, Sweden earned its reputation in Laos through an independent and outspoken foreign policy when it vociferously opposed US military involvement in Vietnam and criticized the US government for expanding the war into Laos and Cambodia. Sweden's Prime Minister Olof Palme said of his country's stance, "For us what was at stake [in the Indochina war] was the defence of the right of the small nations to shape their own future".¹⁵ Sweden first gave humanitarian assistance to Laos in 1974, and in 1977 the Swedish International Development Authority (SIDA)¹⁶ established a full country programme, one of the first Western countries to do so. Even though SIDA did not fund Theun Hinboun, officials at Vattenfall consider that this historical and political record in Laos and the Lao people's resulting trust of Swedes in general remains at the heart of the consortium's success in winning the contract.

Personal Links

Besides Sweden's historical presence in Laos, personal contacts also played a key role in putting the Theun Hinboun project together. As a result of Laos's second dam, the 45-megawatt Xeset, which was built during the 1980s to export electricity to Thailand, close links had grown between the various companies involved and the development aid departments which financed the dam, SIDA and the Asian Development Bank. Norconsult (formerly Norpower), Norway's largest consultancy firm working on hydro projects in the Third World, and the Norwegian turbine manufacturer, Kværner, had won contracts for Xeset.

Norconsult's Gjermund Saetersmoen, who had worked on Xeset from the beginning, lobbied Lao officials actively for Theun Hinboun.¹⁷ His role as a go-between connecting the Lao government, the Norwegian Agency for Development Cooperation (NORAD), and Norconsult is illustrated by a letter sent in January 1992 by the then Lao Minister for External Economic Relations, Phao Boonaphol, to Norway's Ministry of Foreign Affairs. In the letter, Phao requested a grant to pay for a Theun Hinboun feasibility study to be carried out by Norconsult:

"In order not to lose a whole year of time, it is very important that [Norconsult] can continue and conclude the field investigations for the feasibility study during the present dry season and subsequently be able to present their draft feasibility report by October 1992 . . . Mr. Gjermund Saetersmoen will give you more detailed information on his return to Norway."¹⁸

Two other personal links are Zia Noorzay and Karl-Erik Norlander. Noorzay worked with the Asian Development Bank during the 1970s on Laos's first dam, the 150-megawatt Nam Ngum, and now works for Vattenfall. Norlander, working on behalf of Vattenfall's consultancy firm, SwedPower, was hired by SIDA in 1992 and 1993 as an energy adviser to the Lao government. He gave suggestions as to how Laos might harness some 15,000 megawatts of unexploited hydropower and prioritize the array of potential dam projects. He suggested that the government begin slowly with small projects in which it

A Flawed Environmental Impact Assessment

The environmental impact assessment for Theun Hinboun was undertaken by Norconsult, a Norwegian consultancy firm, and financed by the Norwegian Agency for Development Cooperation (NORAD). As Norconsult had no employee with expertise on the ecology of Lao rivers, it sub-contracted the environmental portion of its study to an Australian consultant, Charles Adamson, based in the region.

Adamson maintained that the forests being cleared for 100 kilometres of transmission lines were merely "secondary regenerating forests in fields that have been left fallow". As the farmers working these fields have no legal ownership of the land, they are not, in Adamson's opinion, entitled to any compensation. "If you want to talk about compensation, then you are referring to permanent agriculture."

Farmers who practise seasonal agriculture in the area which will become the "draw-down" zone of the reservoir during the dry season should not be entitled to compensation for loss of land either. "It is a very small area . . . [and] they can draw water from the headpond," Adamson said.

Although Adamson has admitted he is no fish expert, his report of the dam's effects on fisheries was stunningly optimistic:

"Upstream of the dam, the headpond will create an enhanced deep water habitat which did not exist before and this will improve productivity and provide an additional dry season habitat for fish . . . The creation of the headpond can have beneficial consequences on public health conditions. The increase of fresh water fish can provide an improved nutritional source for villagers."

Such claims were made despite there being little scientific data on the ecology of fish life in Laotian rivers; in addition, the consultants did not draw on the rich knowledge of local people.

Adamson argued that not enough is known about the patterns of fish movement to be sure that the overall impact of the drying up of the 40-



Boonthung Temdee's fish catch went down dramatically as soon as construction of the Pak Mun dam started. "I used to catch ten fish weighing 40-50 kilogrammes each. Now I'm lucky to end up with five kilogrammes after a day's work. After ten years, there will be no more fish in the Mun. I may have to go to the Mekong. And if they dam the Mekong, I'll die."

kilometre stretch of the Theun river downstream of the dam for three to four months of the year (six months if the Nam Theun 2 dam is built upstream) will be negative. He speculated that the fish may crowd into other tributaries to avoid the Theun while it is dry:

"Our attitudes have always been based on [Arctic] salmonid species . . . that have routes into specific areas. We are assuming that tropical fish also have definite migratory routes. The question is, would those fish that normally populate the Theun river downstream of the dam be likely to take an alternative route?"

The question remains unanswered in the Norconsult report. However, the effect on fisheries of the World Bank-funded Pak Mun dam in northeast Thailand, which is similar in many respects to Theun Hinboun, gives an indication of what to expect.

Pak Mun is a 136-megawatt run-of-river dam with a narrow 60-kilometre reservoir, built on the Mun river, a large

Mekong tributary whose high fish diversity maintained farming and fisher communities. As with Theun Hinboun, the proponents of Pak Mun claimed there would be no significant impact on fisheries. Yet Thai students, villagers and NGOs found that fish catches upstream of the dam began to decline significantly as soon as construction started in 1989; the blasting of rapids and other disturbances damaged spawning grounds and migration routes permanently.

A concrete fish ladder was added on to the dam at the last minute. In January 1995, the Director General of the Thai fisheries department said:

"We admit that we are working on the fish ladder technology with very poor knowledge about its efficiency. We know nothing about the pattern and behaviour of fish migration. We don't know what species and how many fish daily migrate from the Mekong to the Mun. How far they can go, where they spawn their eggs and how high they can jump."

Local fishers, however, now have a good idea. Since the closure of the dam's flood gates in June 1994, they report that they have seen only two "species" of fish near the dam site: *pla hua taek*

(fish with crushed heads) in the fish ladder and *pla mai mee hua* (fish without heads) in the outflow channel below Pak Mun's four turbines.

The struggle for recognition of the destruction caused at Pak Mun and for compensation has been a case of the villagers' word against that of the Thai authorities, World Bank staff and their select circle of consultants. Some farmers and fishers have received cash indemnities, but three years after the completion of the dam, thousands more continue to demand official recognition for the loss of their livelihoods.

Villagers along the Mun river, who share a similar language and culture with their neighbours across the Mekong in Laos, have often expressed a willingness to share their bitter story. But the prospect of organizing village-to-village exchange elicits only fear of reprisal and jail sentences on both sides of the Mekong.

What Comes After Theun Hinboun?

In 1991, the Lao government announced its plans to build at least 23 dam projects by the year 2020, which would cost about US\$7 billion. Vientiane, the capital of the former French colony, is now bustling with dam builders and their consultants. "You find us the money, we'll give you a river" said an official of the state-owned *Eléctricité du Laos* to a visiting hydropower consultant in 1995. Some of the major projects which are already financed and under construction or are seeking financing are as follows:

Nam Theun 1 (400 MW) downstream of Theun Hinboun would flood about 500 square kilometres of river valley and lowland forest and displace more than 5,000 people. SUSCO, a natural gas distributor and owner of petrol stations in Thailand and Laos, signed a Memorandum of Understanding in 1991 with the Lao government. In 1995, Electrowatt Engineering Services of England, a British subsidiary of the giant Swiss utility, Electrowatt, conducted a feasibility study including preliminary resettlement and environmental survey.

Nam Theun 2 (681 MW) is a project of the Nam Theun 2 Project Development Group, a consortium which includes Itai-Thai, one of South-East Asia's largest construction companies, Transfield of Australia, state-owned *Eléctricité de France*, telecommunications company Jasmine International, and the Thai investment house, Phatra Tanakit. To date, the Thai Export-Import Bank has provided five per cent of the costs to the consortium to get the project off the ground. The Lao government has requested US\$90 million from the International Finance Corporation and a World Bank guarantee to protect commercial investors. The bulk of the US\$1.2 billion cost is expected to come from commercial banks and export credit agencies.

Three leading commercial banks — Barclays (UK), Société Generale (France) and Deutsche Bank (Germany) — have all expressed interest but will lend to the consortium only if the World Bank guarantees their investments. The World Bank has been advising the Lao government on Nam Theun 2 and its hydropower development strategy intermittently since 1990. Last year, the Bank requested further social and environmental studies from the Nam Theun 2 developers before it makes a decision, effectively delaying the project until 1997. EGAT announced in May this year that it would cancel its plans to buy electricity from the dam unless the developers satisfy the World Bank's requirements within the next six months.

Nam Theun 3 (190MW) will start being built immediately, stated the Laotian official news bulletin, *Khao Pathet Lao*, in February 1996. The dam would be upstream of Theun Hinboun and Nam Theun 2. The Lao government holds a 20 per cent share in the project which is being developed by a US company, the Heard Corporation.

Nam Leuk, co-financed by Japan and the Asian Development Bank, aims to divert water to the reservoir of the Nam Ngum dam to increase its power output. The Japanese government is expected to provide about 40 per cent of the costs, US\$85 million, ending a 20-year suspension of yen loans to Laos. The inability of the Lao government to repay its 5.2 billion yen (US\$51 million) loan for the Nam Ngum dam has been an obstacle to new Japanese loans. According to a foreign ministry official in Vientiane, the Japanese will be watching Nam Leuk closely before deciding on the next project to assist.

Nam Ngum 2 (320 MW) has been proposed by a consortium, headed by US businessman Milton Shlapak and comprising Siemens and Bilfinger of Germany, Bechtel of the US, and MDX of Thailand, a part-owner of Theun Hinboun. According to the official news bulletin, *Khao Pathet Lao*, Shlapak submitted a feasibility study to the Lao government in August 1995, describing the project as highly feasible for an investment of US\$650 million and a concession of 25 years. Construction is expected to start at the end of 1996. According to the news bulletin, the consortium will be responsible for compensating and relocating people from the construction site.

Nam Ngum 3 (600-700MW) is to be developed as a joint venture led by MDX of Thailand which has reportedly offered EGAT an acceptable price for the electricity.

Nam Tha 1 (200 MW) was highly recommended in a 1994 Norconsult/ADB energy study for further study and private sector investment. SP International Group of Thailand began a project feasibility study in October 1995. The Lao government holds a 25 per cent share in the project, which is located in northern Laos.

Houay Ho (150 MW) in southern Laos is already 30 per cent built and is expected to be operational in 1998. Developers include Daewoo of Korea with a 60 per cent share, Loxley of Thailand with a 20 per cent stake, and *Eléctricité du Laos* with a 20 per cent share. Loxley is a private company, owned by a founding director of the Thai energy utility, EGAT, which built its fortune on transmission equipment. The Hydroelectric Commission of Tasmania had hoped to win the concession for Houay Ho, but "the Koreans got there first and put a big bag of money on the table" said a Commission employee. The developers agreed in January 1996 to sell Houay Ho's power at 4.22 US cents per kilowatt hour after EGAT threatened to drop negotiations and speed up talks with Nam Ngum 3's developers instead.

Xe Nam Noy (200 MW) would be located in the dense forests of southern Laos and would displace six minority communities. Sources in Vientiane report that the government has already allocated land for resettlement and told people that they will have to move. Swiss Electrowatt was sub-contracted by Korean developers Dong-Ah to conduct a pre-feasibility study in 1995.

Xe Kaman 1 (255 MW) in southern Laos, at 185 metres, would be the tallest dam in Asia. The Hydroelectric Commission of Tasmania signed a contract with the Lao government last year to build it. John Holland of Australia, the company that built the Australian-financed Friendship Bridge across the Mekong between Laos and Thailand which opened in 1994, would be responsible for construction. A Tasmanian company has been granted rights to manage logging and forestry operations in the Xe Kaman watershed instead of the Lao military's company, DAFI, which has controlled all forestry operations until now. Financing is expected to come from a consortium of Singaporean, Malaysian and Thai banks. Logging of the reservoir area, resettlement of villages and plywood production is already underway.

Gráinne Ryder

Gráinne Ryder is editor of *The Mekong Currency* by Liesbeth Sluiter, published by PER/TERRA, Bangkok and International Books, Amsterdam, 1993 (distributed in UK by Jon Carpenter Publishing, Oxford).

maintained an ownership share before moving onto larger ones. At the top of his list was Theun Hinboun.¹⁹

Lack of Public Opposition

Another reason why Laos is attractive to Nordic Hydropower and its associates in the Nordic dam-building industry is that they are unlikely to encounter public opposition there nor critical debate on the ecological and social costs of large dams. Years of resistance in Thailand, for instance, prompted the Thai government to announce in 1995 that no more hydroelectric dams would be built in the country.²⁰ Vattenfall's Anders Hedenstedt, in charge of Theun Hinboun in 1993, remarked at the time:

"The funny thing about [Theun Hinboun] is that there are almost no environmental problems. It's a run-of-river dam that will not use any surface that is not already flooded during the rainy season. This is the only project in the region that seems to have no opposition."²¹

Without a free press or peoples' organizations in Laos, there are few safe forums in which people can challenge such claims. Open debate within the country remains difficult. Laotian critics of dam projects, whether government officials or private individuals, tend to word their comments carefully and speak off the record.

Environmental Impact Assessment

Within the Nordic countries themselves, however, Theun Hinboun has been subject to considerable public debate about the many potential adverse impacts and the extent to which the Nordic consortium and its supporters have ignored the interests of affected peoples.

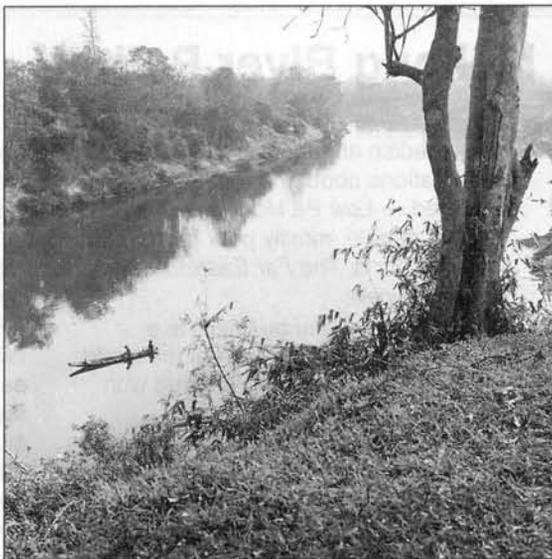
Much of the controversy has revolved around the environmental and social impact assessment for the dam, undertaken by Norconsult and funded through a \$1.5 million grant in 1993 to the Laotian government from NORAD, an agency which has not historically supported development projects in Laos.²²

Before the environmental impact assessment was completed, Vattenfall's Hedenstedt said, "No one anticipates a negative result. The purpose [of the study] is not to point out any dangers, but just to have an independent review. We foresee no problems with that."²³ The study, published a few months later, duly concluded:

"[Theun Hinboun] is highly viable and well-justified. Immediate implementation . . . is therefore recommended."²⁴

It maintained that no local people would need to be resettled and thus no compensation would have to be budgeted for. It claimed that the project would have "significant beneficial environmental impacts" with the only adverse impact being the reduction of flow below the dam site. Fisheries would improve, it stated, because of the raised water level behind the dam (*see* Box, p. 87).

The social impacts section of the study was sub-contracted to anthropologist Jan Ovesen at Sweden's Uppsala University,



The Theun river.

who determined that Theun Hinboun would have no negative social impacts because the area has "no cultural significance".

Ovesen came to his conclusion after a 16-day visit to 22 villages in the Theun and Hinboun basins — an area he referred to as "hitherto ethnographically unknown". He found no evidence of an "ancient culture" or valuable artefacts. Though noting that communities were largely self-sufficient from paddy and swidden farming and a brisk trade in forest products and fish, he concluded that "from an anthropological point of view, [the project] can only have positive . . . effects on the society and culture."²⁵ Stating that swidden (or rotational forest) farming is doomed in any case — "there are no sacred cultural values inherent in swidden cultivation"²⁶ — he recommended that communities in the reservoir area be encouraged to move south where, he claimed, more paddy land was available.

Unanimous Criticism

Norconsult's extraordinary conclusions were received without critical comment by NORAD industry department officials anxious to push Theun Hinboun forward. But under NORAD's review procedure, an environmental impact assessment has to be looked through and commented on by various government agencies and by environmental advisers within NORAD. These reviewers unanimously criticized the study, finding it overtly biased, misleading and inadequate.

The Norwegian State Pollution Control Authority, for example, commented, "the environmental assessment report is far from satisfactory . . . We cannot recommend implementing this project on the basis of the existing data". The Norwegian Water and Energy Authority warned of the "potential for far-reaching environmental and social disturbances".²⁷

The Directorate of Nature Management stated that, of the nine claimed positive effects of the project, three were "highly questionable" and five were "rather insignificant, indifferent or liable to different interpretation". The Directorate delineated numerous omissions, the most serious of which concerned the potential additional impacts if the Nam Theun 2 dam (with three times as much generating capacity) was built upstream.²⁸

Meanwhile, representatives of the Oslo-based International Association for Water and Forest Studies (FIVAS) visited Laos, spoke with villagers in the affected river valleys and confirmed that they had not been informed or consulted by the developers.²⁹

Even the senior ecologist at Vattenfall, Per Sjöström, pointed to three crucial areas not covered in sufficient depth in the Norconsult report: water quality; fish production and fish migration; and material transport and sedimentation. He noted the absence of detailed plans for fisheries management in the reservoir, rural electrification, irrigation and mitigation of downstream impacts.³⁰ He insisted, however, that as Vattenfall had already decided to proceed with the project, these concerns could be addressed along the way.³¹

Mekong River Politics

Although Laos's dam-building spurt is relatively recent, plans for dams in the region's Mekong basin date back at least to the 1950s when a retired general of the United States Army Corps of Engineers, Raymond Wheeler, headed a mission to study the hydro potential of the Mekong river.

Wheeler's recommendations led to the creation in 1957 of the Bangkok-based Mekong Committee to promote and coordinate development of the lower Mekong. Decisions were to be made by the governments of the four lower riparian countries — Thailand, Laos, Vietnam and Cambodia — with extensive financial and technical assistance from Western donor agencies, such as the United Nations Development Programme (UNDP).

Wheeler and his team envisioned a great cascade of seven dams along the Mekong's mainstream from northern Laos down to Cambodia's Great Lake, the Tonle Sap, which together would produce more than 20,000 megawatts of electricity. The first of these — the 250-metre Pa Mong dam — would have generated 4,800 megawatts of electricity, necessitating the removal of a quarter of a million people on the Thai and Lao sides of the river. Decades of war, however, made the construction of such large infrastructure projects impossible, and for 38 years, the Committee sat relatively idle, unable to fulfil the mandate that Wheeler had inspired.

SIDA Opposition to Damming the Mekong

During this time, Western donors became increasingly wary of funding large-scale water projects, causing major difficulties for the Mekong Committee which, by the early 1990s, had sunk into obscurity.

Anxious to revive the Committee and its plans, the Committee's then Executive Agent, Canadian Chuck Lankester, attempted to push through a radically-scaled down version of Pa Mong (re-named Low Pa Mong) on the lower part of the Mekong. However, Erik Skoglund, a Swede working with the Committee in Bangkok who had been hired through

the Swedish aid agency, SIDA, had reservations about the resettlement involved — Low Pa Mong would evict 60,000 people, mostly poor farmers. He outlined his to *The Far Eastern Economic Review*:

"The resettlement business is a major problem. No donor in the world will allocate funds for Pa Mong with this problem."

Lankester was furious that Skoglund had contradicted him publicly and told the Swede to "reconsider his service to the Mekong Committee". Skoglund resigned, disillusioned, but before he left, a SIDA mission visited Bangkok and made its support for Skoglund's position clear:

"Without taking a stand on whether [Mekong] mainstream projects like the Low Pa Mong are economically and technically feasible and environmentally acceptable, the members of the SIDA delegation expressed that . . . it would be difficult for the [Committee] to find soft financing for such projects. Resettlement schemes involving 60,000 people constitute a major obstacle to financiers such as SIDA . . . and other financiers including the development banks."

No other bilateral or multilateral aid agency has come close to such point blank opposition to large dams. SIDA decreased its support over 1992-1994 for the Mekong Committee because of the Committee's lack of a clear mandate and, reportedly, because of its concerns about the overall environmental impact of dams on both the Mekong and its tributaries, as well as of Thailand's water diversion projects. Renewed SIDA financing was conditional on a new agreement in the Mekong basin that addressed these issues.

Revival

In April 1995, such an agreement was signed by the governments of the four lower riparian countries at a ceremony in the northern Thai town of Chiang Rai. A Mekong River Commission was established to replace the four-decades-old Committee. The new agreement weakens the 1957 founding statute of the original Mekong Committee that gave riparian states the right to veto any project affecting the mainstream Mekong. It does not give downstream states power to take action

against upstream states which divert water from the Mekong or interfere with the river's flow.

Although the new document is replete with rhetoric about sustainable development and environmental protection, the new Commission's *raison d'être* is patently to promote dam-building. In December 1994, the Mekong Secretariat published a study, financed by UNDP, entitled "Mekong Mainstream Run-of-River Hydropower". It identified 11 dams on the mainstream whose "scale of development [was] deliberately constrained to avoid or to minimize impacts". Yet most of these are massive projects of over 1,000-megawatt generating capacity. In addition, Norconsult carried out an energy study of the Mekong river countries for the Asian Development Bank in which it prioritized 54 hydropower projects from Yunnan in China down to Vietnam.

Such developments are worrying environmentalists in the region. Some 30 Thai non-governmental organizations and local water basin groups met in Chiang Rai at the time of the founding meeting of the Mekong Commission. They expressed opposition to the influence of the dam-building industry in the new agency, and concern about Thai plans to divert the Mekong to solve Bangkok's water shortage. They pointed to the ecological complexities of the Mekong river basin and described it as a "centre of great cultural diversity, representing a heritage that is both unique and of great value for the world."

Western aid donors, however, have unanimously hailed the new Commission as an example of improved regional cooperation. In spite of SIDA's explicit opposition to damming the mainstream Mekong, the agency renewed and increased its three-year support for the Commission's environmental work after April 1995, arguing that it would not be directly involved in building the dams. SIDA's stance against dams on the Mekong, coupled with its failure to defend its position, illustrates the tensions within the aid establishment between professed environmental concern and the imperative to subsidize its national dam-building companies.

The Fox Watching the Geese

Outside the Nordic region, the Norconsult study might never have been seen by anyone beyond the narrow circle of dam builders and aid financiers. But Sweden and Norway have relatively open freedom of information legislation compared with other countries in Europe where aid agency documents, including environmental impact assessments, remain "confidential". Thus, in spite of NORAD's reluctance to release key documents, a considerable amount of information on the Theun Hinboun project became publicly available.

Under public pressure, NORAD eventually conceded that the Norconsult report was of poor quality. NORAD's deputy chief, Sven Holmsen, told the Norwegian press, "Everyone now agrees that it was a mistake from the outset . . . We agree that we don't have enough information. Relevant questions have not been asked on environmental aspects of the project."³²

The agency also admitted that Norconsult should have been disqualified from the beginning because it was part-owned by Statkraft, a shareholder in Theun Hinboun. Holmsen described the selection of Norconsult as something akin to asking the fox to watch the geese.³³ In response to the public debate, NORAD ruled that a consultant with a vested interest in the outcome of a dam project would never again be selected to undertake its environmental impact assessment.

Moreover, the agency was forced to pay \$1 million for additional environmental studies of Theun Hinboun. These were coordinated by Norplan, a smaller competitor of Norconsult,³⁴ and were relentless in their criticism of the first report, contradicting all of its major conclusions and declaring it irrelevant, misleading or inaccurate.

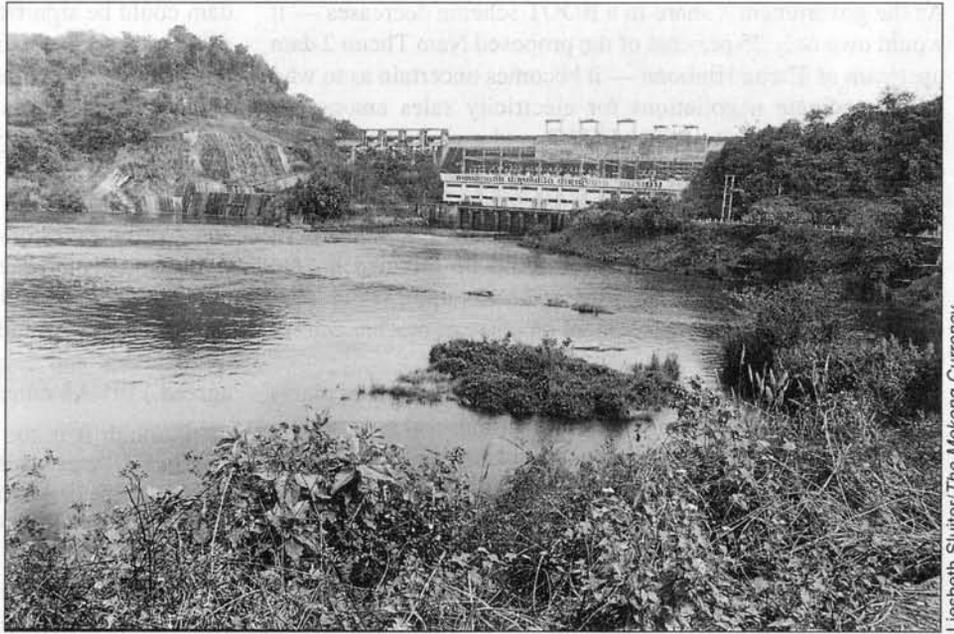
Norplan's rural development study, for example, stated that "[villagers] have no idea of the potential changes . . . They also seem to have no choice but to accept any environmental consequences from the project."³⁵

Its study of the impact on aquatic life concluded that without a minimum flow in the Theun river all year round, the dam would "more or less completely destroy the fisheries" in the 40-kilometre stretch of the river downstream. It noted that overall fish catches would probably be reduced and fish diversity degraded, possibly to the point of extinction of some species. The study recommended that 6-15 cubic metres per second of water be released during the dry season and that an artificial fishway be added to reduce hindrances to fish migration.³⁶

Norplan also found Norconsult's estimates of sedimentation in the reservoir to be far too low, implying that the analysis of the dam's economic performance is overly optimistic.

As to wildlife, Norplan surmised that Norconsult had not found any of the numerous threatened species in its survey because its fieldwork had been "exceptionally brief".³⁷

Despite these criticisms, the Norplan study has had little



Laos's first dam, the 150-megawatt Nam Ngum. Some 80 per cent of its electricity is exported to Thailand, the region's most rapacious energy consumer. Thailand is likely to remain the main buyer of Laotian electricity for some time, although in 1995, Lao and Vietnamese officials began discussing possible energy cooperation, technical assistance for dam construction and electricity sales.

impact on the decision-making process or design of the dam. Indeed, it seems to have been commissioned more to placate critics than to improve the project. Before the Norplan studies had even been commissioned, NORAD had paid a further \$5.5 million for the first consultants, Norconsult, to carry out the technical design for Theun Hinboun; by the time the Norplan studies were finished at the end of 1995, the dam was already a year into construction.

Rivers for Rent

Nonetheless, concern over the dam remains, with critics also highlighting the dubious benefits of the BOOT private financing arrangements. Proponents of Theun Hinboun and other dams call the BOOT arrangement a "win-win" situation because it provides electricity for the buyer and profits for the producer and because, in theory, the national government incurs little or no debt since private investors provide the capital. But as Laos considers renting its rivers out to Korean, Australian, Italian, Japanese and French companies, all now staking their dam-building claims, the country could well end up having as little say over its national energy policy as a vassal state in the colonial era. This risk is accentuated by the lack of relevant legislation and institutions in the country and an absence of Lao personnel who read and understand English sufficiently to navigate their way through voluminous project documents. A 1994 SIDA-financed review of the Lao energy sector warned:

"We . . . fear that the massive inflow of foreign capital that would be required to finance the planned hydropower development may jeopardize the Lao PDR's possibilities to maintain a minimum of national control over basic natural resources and, indeed, over the general economic development of the country".³⁸

As the government's share in a BOOT scheme decreases — it would own only 25 per cent of the proposed Nam Theun 2 dam upstream of Theun Hinboun — it becomes uncertain as to who will coordinate negotiations for electricity sales among the buyer, Thai electricity utility EGAT, and a myriad of foreign contractors; and who will guarantee that full commission on profits — the rent for the river — is paid to the Lao government. The Lao government has failed to safeguard the interests of people and the environment who would be affected by the schemes and has expropriated the resources upon which they depend without providing any legal recourse or mechanism for just compensation.

It is also unknown what condition the dams and power plants will be in when they are handed over to the national government when the BOOT agreement runs out and whether the government will be able to afford to replace turbines or to dredge silt-filled reservoirs if need be. What if, after several decades of use, the dams are longer functional, as is happening in Thailand? The SIDA report noted: "There must not be just a heap of junk to be turned over [to the government after 20-30 years]."³⁹

Compensation and Mitigation

Private investors are counting on steady profits from Theun Hinboun, based on Norconsult's 1993 assessments. But revenues and thus the commercial viability of Laos's first BOOT

dam could be significantly reduced if water has to be released during the dry season to maintain a minimum flow in the riverbed; if other dams such as Nam Theun 2 are built upstream; and if a fish ladder is added.

Perhaps most costly of all would be further compensation and mitigation measures. The \$1 million set aside for compensation and mitigation in the BOOT agreement between the Lao, Thai and Nordic investors is unlikely to cover the losses of land, livelihood, fisheries, forest and wildlife — even if a dollar price could be ascribed to them. (The compensation figure was based on the NORAD-funded studies which vastly underestimated these losses and responsibility for compensation was never agreed.) FIVAS concludes that:

"although it is too late for the social and environmental issues to be given their proper place in the project preparations, some of the impacts can be mitigated. It is a minimum demand that affected people get compensation for their losses."⁴⁰

So far, NORAD has been non-committal about allocating more funds for Theun Hinboun while Statkraft maintains that it has no legal obligation to do so. The Swedish part-owner, Vattenfall, has suggested that the Lao government should use its revenue from the dam to compensate farmers and fishers.⁴¹

Others, however, argue that governments and hydropower developers should not be allowed to wash their hands of the negative consequences of their dam building spree in Laos.

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The Animal Heart of the Matter

Xenotransplantation and the Threat of New Diseases

by

Florianne Koechlin

Xenotransplantation — the transplantation of animal organs into humans — is being promoted as the solution to a “shortage” of human “body parts” for medical operations. To prevent the human immune system from rejecting these organs, researchers intend to engineer pigs genetically so as to trick the immune system into reacting to the animal’s organs as if they were human. Companies stand to make large profits from the techniques, but the risks of xenotransplantation — in particular, of creating new pandemics as animal diseases are transmitted to humans — are high. Critics are therefore calling for a moratorium on research.

Organ transplants from humans to humans are increasingly routine in the West as a means of treating diseases which involve organ failure. In Britain, the number of kidney transplant operations has more than quadrupled since the early 1970s, rising from some 400 in 1972 to over 1,744 in 1994.¹ Moreover, as surgical skills and drugs to overcome organ rejection have improved, the outlook for transplant patients has been transformed. Whereas in 1951 the first person to receive human kidneys died within hours, today some 70 per cent of kidney transplant patients live for at least five years, whilst the figures for heart and liver recipients are only slightly lower at 62 per cent and 54 per cent respectively.²

The majority of human organs for transplantation come from donors who are deemed to be “brain stem dead” but whose lungs are artificially kept working in intensive care units so that their hearts still beat.³ Fewer fatal car crashes, however, have reduced the number of potential organ donors, as has stricter legislation. In the US, for example, doctors now have to ask the relatives of any suitable donor for permission to use organs; many do not wish to do so, fearful of causing distress, and thus the organs are not removed.⁴

Meanwhile, as the success rate for organ transplantation has risen, so the demand for operations has increased, leading to a shortage of spare “body parts”. In the UK, nearly 1,000 people are waiting for heart transplants, whilst the waiting list for kidney transplants rose from 1,274 in 1978 to nearly 5,000 in 1994.⁵ In the US, an estimated 100,000 people are seeking transplants — only a quarter of them are likely to receive a new organ.

Such shortages have led to an international trade in body parts, with Western “brokers” offering poor people in Latin America, South Asia, Eastern Europe and Africa money or consumer goods in exchange for their kidneys, corneas and patches of skin.⁶

A number of pharmaceutical companies, however, notably Swiss multinational Novartis (formerly Sandoz and Ciba) and its British subsidiary Imutran, both operating in Europe, and Alexion and Nextran in the United States, are seeking to use baboons and genetically-engineered pigs as an alternative source

of organs for humans. In the US, Nextran has transplanted genetically-modified pig hearts into baboons, whilst in the UK Imutran has announced its intention to proceed with the first human trials using genetically-modified pig organs by the end of 1996.⁷

Should such trials lead to regulatory approval of “xenotransplantation” — the transplantation of animal organs into humans — Novartis, Imutran and the other companies involved in developing the techniques stand to make substantial profits. According to stock exchange analyst Peter Laing, xenotransplantation could create a transplantation boom, allowing the number of kidney transplants worldwide to climb from 33,000 today to 300,000 by the year 2010; heart transplants from 3,000 to 110,000; and simple lung transplantations to leap from today’s 1,200 to 30,000.⁸ Calculating that 320 pig breeding units would be required to satisfy the demand — at a capital cost of US\$650 million (excluding land costs) — Laing concludes: “At our assumed transfer price to hospitals of US\$10,000 per organ . . . annual revenues from pig organs would be around US\$5 billion in 2010.” Sandoz is investing one billion dollars into researching xenotransplantation, while Roche, Hoechst, Fujisawa, Bristol-Meyers Squibb, Du Pont and Monsanto also hope to get a slice of the giant cake.

Animals Within

Occasional attempts to transplant animal organs or tissues into human beings have been made since the beginning of the century.⁹ The first “successful” operation, however, was not carried out until 1964, when surgeons in the US transplanted chimpanzee kidneys into six patients, one of whom survived for nine months while the rest died within hours or days. That same year, the first pig heart valve transplant took place in the UK, an operation that is now routine. Since then, 20 operations involving the transplantation of sheep hearts, pig hearts, pig fetal islet cells and fetal neural cells, baboon kidneys, baboon hearts and baboon livers have been performed, with varying degrees of success worldwide. Most recently, in December 1995, Jeff Getty, a US AIDS patient, received a bone marrow transplant from a baboon in an operation to restore his weakened immune

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system. Although subsequent tests suggest that the transplant failed to "take", Getty left hospital in January 1996, fit enough to resume his hobbies of sailing and weight training — a recovery that doctors have ascribed to Getty's positive mental attitude. The surgeon leading the team that treated Getty is now seeking permission to conduct a baboon marrow transplant on a second patient.¹⁰

Humans are not the only recipients of other species' organs. As Martin Redfern, an executive producer with the BBC World Service science unit, reports:

"Hearts have been transplanted between different subspecies of goat and in all manner of combinations between sheep, pigs, baboons and chimps. Most bizarre of all were claims made in 1986 that an American neurosurgeon had performed 50 transplants in which the heads and bodies of apes had been exchanged. The reported aim was research to eventually provide terminal cancer patients with new bodies to support their healthy brains."¹¹

Acute Discomfort

No xenotransplantation has so far been successful in the long term, most patients surviving only a few hours, days or months at most and generally in acute discomfort. In 1992, for example, Thomas E. Starzl, a pioneer of xenotransplantation at the University of Pittsburgh, US, transplanted a baboon liver into an HIV patient with hepatitis B infection.¹² In turn, the patient suffered from septic intoxication, oesophagitis, followed by viraemia (the presence of viruses in the blood), haemorrhage in the pleural cavity and later the collapse of his circulatory system. Finally, his kidneys and liver failed and his gall bladder swelled. He died 70 days after the transplantation from internal bleeding.

Nonetheless, Starzl considers the xenotransplantation a success, since the baboon liver functioned almost uninterruptedly. Moreover, a subsequent autopsy revealed that baboon cells had been carried around the body by the bloodstream and had become integrated into all the body's organs — a sure indicator, in Starzl's view, that the transplantation had "taken".¹³ Indeed, for Starzl, success of xenotransplantation is measured by the extent to which the patient becomes a cellular and genetic mix of human and animal — a condition which he terms "post-transplantation-chimerism". The higher the level of "chimerism" that is achieved, the greater the chances that the patient will survive.

Some Complement

One major reason for the failure of xenotransplantation to date is that of "hyperacute rejection", in which the recipient's immune system reacts against cells whose surface molecules ("antigens") it identifies as "foreign". The immune system's response to foreign antigens is to produce chemicals called antibodies — and even whole cells — which "attack" the "invading" antigens by sticking to them. This in turn triggers another reaction in which other chemicals, known as "complement", attack the foreign cells and destroy them by dissolving their membranes so that they burst open. The greater the differences are between body cells and foreign cells (as perceived by

the recipient's immune system), the more severe the immune system's response.¹⁴ Where pig organs have been transplanted into humans, the resulting "complement cascade" has been known to disintegrate the transplanted organ within seconds in front of the surgeon's eyes.

Pig organs provoke a more violent "hyperacute rejection" than baboon organs,¹⁵ since pigs are further removed as a species from humans. However, from the point of view of industry, pigs have a number of advantages over baboons which, increasingly, make them a favoured "donor species". Not least of these advantages is the public's familiarity with the pig which, unlike the baboon, is a domesticated animal. Such familiarity, industry believes, will make it easier for the public to accept the pig as a "legitimate" species for experimentation. It is also argued that baboons and other primates will suffer more than pigs if bred in confinement.¹⁶

If pigs are to be used as donors, however, the major problems of "hyperacute rejection" must be overcome. Industry is now looking towards genetic engineering for a solution. Human body cells are coated with a layer of proteins that prevent complement from attacking them; through genetic engineering, researchers hope to create "transgenic" pigs whose cells will produce these human protective proteins (*see* Box, p.95). When organs from the engineered animal are transplanted, the patient's immune system will thus (in theory) be tricked into accepting the new body parts. In effect, "the donor animals are given markers which tell the recipient's immune system: 'Don't attack me. I'm not really foreign'."¹⁷

In Britain, Imutran claims to have made significant headway in using this technique to overcome hyperacute animal organ rejection. Recently, researchers at the company transplanted transgenic pig hearts into monkeys: eight monkeys lived for an average of 40 days and two for more than 60 days.¹⁸ However, the monkeys required such high doses of immunosuppressive drugs that some only lived for a very short time. Moreover, the "transplanted" hearts were not placed within the monkeys but were sewed on to them. Nonetheless, the race is now on in the UK and the US to carry out the first transplant of a "humanized" pig organ into a human.

Warnings

Amid this euphoria, some specialists are urging caution. Germany's most prominent expert in xenotransplantation, Claus Hammer of the University of Munich, has warned that scientists are ignorant of many of the risks of xenotransplantation and that research is racing ahead too fast.¹⁹ He is not alone. In October 1995, a poll by the journal *Xeno* of researchers revealed that 70 per cent were seriously concerned by the speed at which some of their colleagues were proceeding.²⁰ Meanwhile, a British group, Doctors and Lawyers for Responsible Medicine (DLRM), have written to the government, calling for an immediate moratorium on xenotransplantation:

"Common sense tells us that transgenic transplants represent one experimental technique (the production of transgenic animals) superimposed on yet another experimental technique (the transplantation of transgenic organs into human beings). This situation translates into a statistical nightmare, since there is an exponential increase in unknown risk."²¹

New Diseases

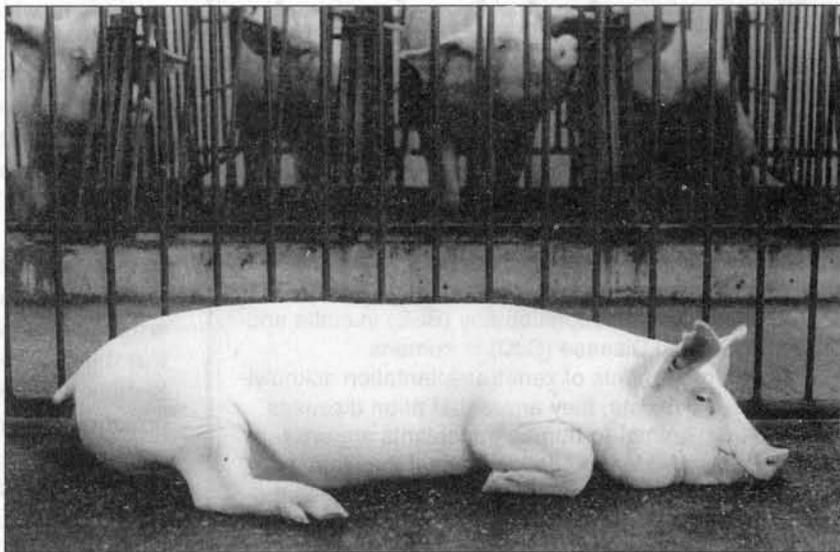
Perhaps the greatest risk is of major new diseases developing in humans. Animals normally harbour pathogens — from viruses to bacteria and prions (*see* Box, p.96) — which are either harmless to the animals themselves or dormant. If animal organs are transplanted into humans, the animal pathogens are automatically transplanted as well. Once inside the human body, they may mutate or recombine with other pathogens to form new infectious agents that are dangerous to humans. If the organ recipient is infected, he or she may go on to infect others who may then infect others and so on — at the extreme, creating a global pandemic.

Even proponents of xenotransplantation recognize this risk: indeed, some 30 per cent of those interviewed in the 1995 *Xeno* poll acknowledged that the transmission of disease from animals to humans represented a "significant hazard".²² The majority, however, argue that the risks are small. Nonetheless, as the Nuffield Council on Bioethics recently concluded in its 1996 study of the ethics of xenotransplantation:

"It is extremely difficult to assess the level of risk that an animal disease will be transmitted to the human population as a result of xenotransplantation. Experts in the field differ widely in their opinions. The conclusion would seem to be that, when considering the possibility of xenografting leading to the transmission of disease into the human population, the risk is unquantifiable and it may be extremely small. *But it cannot be ruled out.*"²³

Disease crossover from one species to another is a well-established phenomenon.²⁴ Although viruses, for instance, are usually specialized to one host only — the HIV virus, for instance, is deadly to human beings but does not affect cats or baboons — they can, and do, undergo changes that enable them to infect new species or take on new characteristics.²⁵ A case in point is the feline parvovirus which has infected at least two new hosts, mink and dogs, in the last 40 years.²⁶

Indeed, most of the new viral pathogens that have appeared in humans in recent years are zoonotic, that is, their natural hosts are animals, often rodents, birds or pigs. In 1962, for example, the Machupo virus caused an epidemic in Bolivia after leaving its original host, the rodent *Calomys callosus*, to attack humans. Likewise, in 1967, the importation into Germany of vervet monkeys infected with the Marburg filovirus resulted in the infection of 31 people, a quarter of whom died.²⁷ Junius virus in Argentina and the Lassa virus in West Africa are further examples of viruses which have jumped from an animal host (in this case, mice) to humans, while in Egypt, mosquitos carry the pathogen of Rift



A transgenic pig raised by Nextran

Transgenesis — manipulating animals to accept genes from other species — is the main technique used in the genetic engineering of animals. It involves inducing a mature female to release multiple eggs through fertility treatment. She is then mated and the fertilized eggs removed. The eggs are injected with the genes that researchers are seeking to manipulate — an exceedingly difficult procedure — in the hope that they will be incorporated into the egg's genetic material and thus into every cell in the growing embryo. The embryos are then put back into the female animal.

In many cases, the technique is unsuccessful. But in a small percentage of embryos, the "transgenes" will be accepted; if these embryos

"take" in the uterus and come to term, transgenic offspring are born. If these animals are subsequently bred, their offspring will probably carry the transgene and inherit the modification, enabling a "pure" line to be established through selective breeding.

In creating transgenic pigs so as to transplant their organs, the genes which produce human complement inhibitors are injected into the fertilized eggs. No one knows for certain, however, how many genes are involved or what effects they will have in other genetic contexts. Organs transplanted from "humanized" pigs will (in theory) be recognized by the human immune system as "human" — even though they came from a pig.

fever from cattle to humans. Many influenza viruses have their origins in pigs, ducks and chicken which act as reservoirs for the disease, new strains of which are constantly being formed in their entrails. These find their way to humans via excretions into the environment and, from there, spread around the world.²⁸

AIDS, for example, is believed to have resulted from the transmission of a monkey virus into humans. Recent research reveals a close genetic relationship between Simian Immunodeficiency Virus (SIV) and the two types of Human Immunodeficiency Virus (HIV-1 and HIV-2) held to be responsible for AIDS in humans.²⁹ Moreover, a number of laboratory workers who have nursed monkeys infected with SIV have subsequently been found to be carrying SIV antibodies, suggesting that they have been infected with the virus. Researchers also point out that the geographic distribution of HIV-2 infection in humans in West Africa closely parallels the natural habitat of the sooty mangabey monkey, and that HIV-2 is more closely related to SIV than to HIV-1. As Louise Chapman of the US Centre for Disease Control notes:

Transgenic Animals and Prion Diseases

Much of the concern over xenotransplantation has focused on the dangers of viruses being passed from animals to humans. However, prions constitute another type of infectious agent that could well pose major problems. Prions, which are already known to pass from animals to humans, are held to be responsible for Bovine Spongiform Encephalopathy (BSE) in cattle and Creutzfeldt-Jakob Disease (CJD) in humans.

Although proponents of xenotransplantation acknowledge that a risk exists, they argue that prion diseases resulting from animal-to-human transplants are unlikely to pass into the wider population, even if they infect individual recipients of transplants. This is because the main route for the transmission of prion diseases is by eating infected material.

However, the use of transgenic animals to provide organs for transplant could result in novel prions being created which cause disease not only in the animals themselves but also in other species. Humans could thus become infected with the prion either through eating the transgenic animal or through some other route. As Peter Wills of the University of Auckland points out:

"A pathological prion produced in the lungs of a transgenic animal could become airborne and, considering the hardiness of prion agents, would represent an unprecedented hazard to human health against which we would have difficulty in devising a defence."

In New Zealand, where the issue of prion diseases and transgenic animals has been the subject of much public concern, the Chief Veterinary Officer admits that "the use of transgenic animals certainly raises new problems" but argues that "it is not beyond the capability of scientists, regulators and society to address them properly." As Britain's beef herds are slaughtered in an attempt to eradicate BSE, however, others may have less faith in the capacity of scientists and bureaucrats to prevent pandemics.

Source: Wills, P.R., "Transgenic animals and prion diseases", *New Zealand Veterinary Journal* 43, 1995, pp.86-87 and subsequent correspondence.

"Compelling arguments suggests that the epidemics of HIV types 1 and 2 resulted from the adaptation of simian retroviruses across species lines into humans. These data suggest that the HIV-2 epidemic in West Africa began with the transmission of SIV from a sooty mangabey into a human, with subsequent transmission among humans. In Central Africa, the cross-species transmission of SIV from a different species of primate, probably the chimpanzee, appears to have resulted in the HIV-1 pandemic."³⁰

Viruses at Play

As German evolutionary biologist Christine von Weizsäcker argues, xenotransplantation greatly facilitates such disease

crossovers by presenting pathogens with an "evolutionary playground" in which to mutate into human pathogens. The "humanization" of pig complement inhibitors, for example, could enable pig viruses to "learn to read" human complement inhibitors and to attack human cells and organs,³¹ thus more easily turning pig pathogens into human pathogens.³²

In a 1988 experiment, Julie Overbaugh and her team from the Harvard School of Public Health in the US induced relatively harmless cat retroviruses (FeLV-A) into cat cell cultures. In nine out of ten cases, new modified viruses emerged. One virus caused a disease similar to AIDS in cats and, unlike the original virus, was also able to infect dog cells. The new virus was thus not only more dangerous than its parent virus; it also had new hosts. Significantly, Overbaugh believes that one of the principal reasons why the originally harmless cat retroviruses were so successful in creating harmful new viruses was precisely because they were introduced *directly* into cell cultures and given sufficient time to combine with existing viruses within the cell.³³

The same favourable conditions result when animal organs are transplanted into humans, only on a much larger scale: the "humanized" animal organ is integrated directly into the human body for a lengthy period of time, requiring no complicated pathways for the animal viruses to negotiate before reaching (and then adapting to) their new human host. Indeed, as von Weizsäcker remarks, inserting animal organs into human recipients could lead to a dramatic dissolution of the barriers that protect species against pathogens of other animal species.

Two additional properties of xenotransplantation also favour the creation of dangerous human pathogens. Firstly, transplant patients are treated for a long time with drugs to suppress their immune system to minimize the likelihood of immune reactions; their weakened immune systems are much less likely to attack foreign (animal) pathogens. Secondly, transplanted animal organs do not remain as separate entities in the human body. The animal cells, together with their viruses, migrate throughout the body, integrating everywhere — in the skin, nose or in the leg muscles — thus placing selective pressure on the animal pathogens to adapt to their new human host. Such pressure is further increased by the immense stress to which the transplanted animal pathogens are exposed. Stress is known to be a major factor in increasing adaptive mutations, forcing organisms to adjust to new conditions in a much shorter time than they would otherwise.

Under Control?

Marian G. Michaels and Richard L. Simmons of the University of Pittsburgh have both researched the risks of an infection after xenotransplantation. They make two recommendations: that the donor animals should be raised in as sterile conditions as possible; and that donor animals should be examined carefully for the absence of approximately 50 pathogens before a xenotransplantation is performed.³⁴

However, as molecular biologist Jean Francois Bach, a convinced advocate of xenotransplantation, acknowledges, even these precautions cannot provide full protection against new diseases: "Even inbred baboons are affected by viruses. In addition, not all monkey-viruses are known and cannot therefore be tested for".³⁵ Moreover, as virologist and AIDS specialist Jonathan Allen points out:

"The natural host for some infectious agents may also be naturally resistant to any disease associated with infection, which means that there is no way of knowing from any outward appearance whether or not a baboon, for example, carries a potential human pathogen."³⁶

Such uncertainties have recently led Paul Herrling, Director of pharmaceutical research at Sandoz, to argue for severe restrictions — and possibly even a moratorium — on the use of baboons in transplants. Nonetheless, he and his colleague Thomas Cueni, the Secretary General of Interpharma, a Swiss pharmaceutical lobby group, maintain that, because pigs have been domesticated for so long, "the probability of discovering some new pig disease that is dangerous to humans is exceedingly small."³⁷ Significantly, the same argument was used to deny the possibility that Mad Cow Disease could be passed to humans.

I and I: Human-Animal Chimeras

In addition to the possibility that xenotransplantation will create new diseases, the technique also raises numerous other ethical dilemmas. Can one justify the genetic engineering of animals, including humans? Is it right to use animals as spare parts for humans? And how might such transplants alter our view of what it is to be human? An animal organ transplanted into a human recipient is not like a new radiator in a car: as a living body part, it affects the entire body, leading to animal cells being dispersed throughout the body. The borderline between "animal" and "human" is thus modified, bringing the very identity of the "human" patient into question. What does it mean if 'I' consist of many human and many baboon cells? Or what if my ears and hands are made up of human and pig cells? If I am a mixture of different creatures, how does it affect my sense of "self"?

Here, the advocates of xenotransplantation argue that because the body's "blood-brain barrier" prevents animal cells from entering the brain, the patient's humanity is protected. But is it really possible to separate the body from the brain? Can we really assume that a person's "intellect", "soul" and "identity" are located in the brain? And that it therefore does not matter whether the rest of the body is turned into a human-animal-chimera? Can we really hold to such a mechanistic view of our bodies? Is it not time to reassess our views of the relationship between body, soul and spirit — and our relationship to other forms of life?

Immediate Freeze!

Xenotransplantation may represent a great hope for prolonging the lives of individual patient groups. Yet it could also endanger the entire population. For that reason, the assessment of risk cannot be left to patients or interested scientists alone. In 1974, the world's most eminent molecular biologists unanimously agreed to a voluntary freeze on genetic engineering at a conference in Asilomar, US. A similar freeze on xenotransplantation is now imperative. The risks of creating new pandemics are simply too great to allow the technology to proceed without a full, informed and vigorous public debate. Such a debate would, in my view, lead to an eventual ban.

The Basel Appell has launched a call for a moratorium on xenotransplantations. To sign on to the Appeal contact: Basel Appell, P.O. Box 74, Basel 4007, SWITZERLAND.

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Cost-Benefit Analysis, Rationality and the Plurality of Values

by

John O'Neill

Critics of cost-benefit analysis have often called attention to the difficulties of quantifying environmental "goods" and "bads" consistently. Intractable as these problems are, however, they result from a more general confusion between rational decision-making and calculation which afflicts most orthodox twentieth-century economics. This confusion is tied to an institutional framework which frustrates the full use of rationality in environmental choice. Current efforts to "green" economics should abandon the attempt to commensurate plural values and focus instead on the institutional conditions which enable individuals and groups to treat the environment in a prudent and sensitive way.

Cost-benefit analysis (CBA) looks to be increasingly influential in environmental policy-making. In Britain, the growth of an audit culture in government has led to growing demands for monetary expressions of the benefits of environmental projects. In the United States, CBA has been put forward as a way of evaluating efforts to enforce environmental legislation. Throughout the South, too, experts use CBA on the ground that it will help them make decisions about all kinds of development projects and programmes.

Yet the technique is also subject to growing criticism. Much of this has focused on its inegalitarian consequences. Benefits and costs are measured in terms of individuals' willingness to pay for a "good" or to avoid a "bad", but since people's willingness to pay is constrained by their budgets, goods and bads, in standard CBA, count for less for the poor: "the poor sell cheap".¹ These distributional consequences have been dramatically illustrated in the recent controversies around economists' attempts to estimate the benefits and costs of global warming for the Intergovernmental Panel on Climate Change.²

But it is not just the distributional consequences of CBA which are open to criticism; also open to scrutiny is the very conception of "reason" that CBA embodies. According to this conception, for a decision process to be rational, there must exist a) a set of technical rules such that b) given a description of a different object or state of affairs, they yield c) by a mechanical procedure d) a unique and determinate decision. Rational choice, according to this conception, presupposes a single unit of measurement, capable of ranking all objects and states of affairs from "best" to "worst". According to many economists, it requires even more: a common unit of value of which the best option will possess the greatest amount.

CBA's critics have challenged this entire conception of rationality. They argue that no such single common measure is required for rational decision-making. Indeed, they suggest, the attempt to commensurate all objects and states of affairs

exemplifies irrationality by circumscribing and cutting short the debate, discussion and exercise of practical judgement which lies at the heart of much rational decision-making.

Strong Commensurability

Most cost-benefit analysts assume that rational decisions require *strong commensurability*. This means that there has to be a particular single property that all objects and states of affairs possess, and that this property is considered to be the source of their value. Evaluations of how much people are willing to pay for environmental goods (or how much they are willing to accept for their loss) indicate the amount or the degree to which that property is present. Strong commensurability presupposes that apparently different kinds of value be regarded as instances of just one super-value which provides a unique best ranking of a set of values. That is, it presupposes *value-monism*.

Values, however, are irremediably plural. The fact that I prefer A to B with good reason is not evidence that A possess more of some overarching super-value that is present in all my other potential choices as well. This is true whether this super-value is conceptualized as pleasure, usefulness or some other abstraction. Pleasure, for example, could not provide a single value by which to rank goods, since pleasures themselves are plural in character — beer and good conversation, for example, are not measurable on a single scale.³

It is sometimes suggested that the mere fact that one range of alternatives is chosen over another shows that all the selected options must share the single super-value of being preferred (or preference-satisfaction itself) — and that money or some other metric can provide a means for measuring this super-value. But we do not value an alternative option because it is preferred: we prefer it because of its value. In situations in which different ranges of values come into play, our preferences merely record our judgements in resolving conflicts between them. They do not provide the supreme value through which they are resolved.

Problems with the assumption that all values can be captured by a single monetary measure are apparent in protests against

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willingness-to-pay surveys. Respondents to such surveys often simply refuse to put prices on certain items when asked how much they would be willing to pay for them. Even those who do respond often reveal deep uneasiness in follow-up discussions.⁴

These protests and misgivings are typically treated by environmental economists as either strategic bids or as founded upon "misunderstandings" or "lack of knowledge of economics". Economists often defend CBA by saying that to use money measures is not to assume that money is the supreme value.

Such responses, however, miss the point of the protests. A more fruitful interpretation of the protests can be found by contrasting modern surveys with what must be one of the earliest reported willingness-to-pay surveys which is described in Herodotus's *Histories*:

"When Darius was king of the Persian empire, he summoned the Greeks who were at his court and asked them how much money it would take for them to eat the corpses of their fathers. They responded they would not do it for any price. Afterwards, Darius summoned some Indians called Kallatai who do eat their parents and asked in the presence of the Greeks . . . for what price they would agree to cremate their dead fathers. They cried out loudly and told him to keep still".⁵

In contrast to the willingness-to-pay surveys of his present-day economist counterpart, Darius's "survey" actually *aims* to elicit protests. Darius does not dismiss these protests and attempt to look for some other way of discovering the "real" price the Greeks or Kallatai would place on their respective practices. Instead, he uses their opposition to his demand for a price precisely to discover and illustrate what some of the basic commitments of their societies are. He finds that both exhibit a certain type of commitment to a good — practices regarding dead kin — by refusing to put a price upon it. Either society would betray that commitment by treating its value as commensurable with monetary values.⁶ Such refusals reveal neither irrationality nor strategic rationality, but ethical commitments.

Present-day economists fail to note the social meaning of monetary transactions. Take the attempt to put a price on Coronation Hill, a part of the Kakadu Conservation Zone in Australia, an area which for the Aboriginal people is a sacred site containing their dead ancestors. No matter how well-intentioned the Australian Resource Assessment Commission might have been in asking how much people would be willing to pay to stop the mining in the area and preserve the conservation zone, the question is inappropriate.

To approach the issue through CBA — in particular to insist that there must be some price people would be willing to pay to forgo a good to which they are committed in the way the Greeks or Kallatai were committed to their dead — is, in direct contrast to Darius's actions, to abandon all neutrality and to attempt to corrupt the relationships constitutive of a culture. Only someone corrupted by a lifetime in markets could answer Darius's

"To insist that there must be some price people would be willing to pay to forgo a good to which they are committed is often to attempt to corrupt the relationships constitutive of a culture. To treat price as a neutral measuring rod is to fail to appreciate that acts of exchange are social acts with social meanings."

question with a realistic price. To treat price as a neutral measuring rod and acts of buying and selling as exercises in the use of a tape measure is to fail to appreciate that acts of exchange are social acts with social meanings.⁷

The Darius example demonstrates the incommensurability between relationships involved in monetary transactions and certain other relationships. But incommensurability among

different and irreducibly plural values is even more general and widespread. As a result, any attempt to represent all conflicts along *any* single scale, monetary or not, will be fruitless.

Different Descriptions, Different Values

Recent conflicts in Wales illustrate how hard it is to avoid coming to grips with a plurality of values in environmental disputes. Prior to 1991, the Nature Conservancy Council in Wales, as elsewhere in Britain, was concerned with management of Sites of Special Scientific Interest. Within its walls, conflicts tended to be confined to, for example, disputes between ornithologists and botanists over drainage in wetland. Ornithologists might opt for, say, more reed beds and open water that could support a greater variety and number of birds. Botanists, on the other hand, might be opposed to flooding on the ground that it would threaten plant communities. This conflict is already a conflict between plural values, not facts, but both sides, nevertheless, could appeal to shared criteria capable of ranking habitats or ecosystems — species richness, integrity, rarity, fragility and so on.

The formation of the Countryside Council for Wales in April 1991 out of the regional carve-up of the Nature Conservancy Council and the Welsh branch of the Countryside Commission brought new evaluative vocabularies into the picture. For example, the new Council was responsible not only for habitat assessment but also landscape evaluation, which has a distinct vocabulary and an institutional history in the pictorial arts. This led to more acute value conflicts over the spread of rhododendron. This "alien", quickly-spreading Himalayan plant makes a superb landscape feature but has little to offer from a nature conservation point of view because hardly anything can grow under the dense thicket it forms.

The presence of other communities added still further to the complications. Landscape and biological communities might have been able to agree that the disused slate-quarries in Dinorwic, on the Llanberis side of Elidir Fawr in north Wales, which form a huge industrial scar up a mountainside, have little to recommend them and are of small interest to the natural scientist. Yet local people objected to the landscaping proposed for the area on the ground that it would cover up the past. For the local communities, the quarries embodied a sense of place and history — a view I am entirely sympathetic with, since a walk through the quarries, especially the huts higher up, gives a much stronger sense of past and place than a visit to the heritage museums in the valley below.



Graham Bell

A decision not to cover over disused slate quarries in North Wales does not entail a prior judgement that they are "more valuable" left untouched than not. One can say that, as a landscape or a habitat, they are better covered over, while, as a historical site, they are better left uncovered, and that, all things considered, we should choose to leave them uncovered. Making a judgement which crosses perspectives does not involve an appeal to some "supervalue"; it is the total mix of values that we compare, not the rankings of discrete items. Given that the significance of any particular value is always given in its particular context, the choice is never between such discrete items, but between different possible social and natural worlds in which we might live.

In such conflicts, environmental states and sites are evaluated not simply as good or bad, beautiful or ugly, but good or bad, beautiful or ugly under a plurality of descriptions. A site can be at the same time "a good A" and "a bad B", "a beautiful C" and "an ugly D". The Elidir Fawr slate quarries have considerable worth as a place that embodies the work and history of a community, but none as a habitat or landscape. By the same token, a wetland may have little worth as a landscape, but considerable value as a habitat.

None of the values appealed to is reducible to others, nor to some other common value. None straightforwardly takes precedence over others — there is no privileged canonical description for the purposes of an *overarching* evaluation which could rank all such areas against each other. The different appraisals of the sites call upon an irreducible plurality of values. To attempt to arrange the alternatives along a single scale would not aid rational decision-making: it would instead pose a hindrance to reasoned discussion of the choices.⁸

Weak Commensurability

Is there a way of salvaging the idea that all rational decision procedures are algorithmic which do not rely on monetary or any other cardinal units? The authors of the 1989 Ramsey Centre Report on environmental values suggest that CBA is in fact possible without presupposing the existence of a single cardinal unit of measurement. It requires, they say, only *weak commensurability*, an ordering of "betterness" between items:

"All that commensurability of values requires is that one is able make judgements such as 'this is more valuable than that'."⁹

In this sense, environmental values which enter environmental disputes are commensurable "because they can enter judgements of the form 'this is more valuable than that'."¹⁰

On the Ramsey Centre account, either money or some other unit of welfare provides an ordinal measure:

"Our measure of social welfare needs only to rank options (ie. be 'ordinal') and need not contain information about the gaps between items so ranked (ie. be 'cardinal')."¹¹

What the units measure is welfare conceived of as the satisfaction of informed preferences:

"Where money measures are inappropriate, we need to translate the argument into units of welfare, understood as a measure of preferences based on adequate information".¹²

It is such ordinal measures that enter the aggregation procedures of an extended cost-benefit analysis which is then able to "form a basis for sound decision-making in environmental matters".¹³

However, the Ramsey Centre position is flawed.¹⁴ It depends upon an illicit shift in the use of the concept of commensurability. The Report switches between a claim about commensurability that concerns the possibility of certain outcomes of decision-making processes and a claim about commensurability that concerns the decision-making procedures through which outcomes are arrived at. It supposes that all that is required for value commensurability is that our values be such that they allow us to arrive at judgements of the form "this is more valuable than that". Yet the possibility of arriving at such outcomes is quite independent of questions about how one arrived at them, whether it be through some algorithmic procedure applied to ordinal or cardinal measures, deliberative procedures in which the force of argument determines the result, the appeal to authority, or whatever. The possibility of ordering outcomes in terms of a betterness relation does not entail that ordinal measures must appear in the decision-making procedures through which such outcomes are reached.¹⁵

A Failure to Distinguish

The Ramsey Centre report illustrates a general failing in many discussions of value commensurability to distinguish three independent questions:

1. Can we rationally compare options across different and possibly irreducibly plural values?
2. Given enough information, can we always rank all such options before us in a single list?
3. Can we rationally determine or assist a decision between such options by employing ordinal or cardinal measures and applying some algorithmic aggregation procedure to them?

A "yes" to either or both of the first two questions is quite consistent with a "no" to the third. Even if the answer to the second question is "yes" (and I do not think it is),¹⁶ this gives no support to a positive answer to the third question and hence no support to the acceptability of cost-benefit analysis.

The hard choices that have to be made regarding finite resources and the variety of social, cultural, environmental and material goods that have a call upon them are not typically of the kind that can be made using either cardinal or ordinal scales of measurement. They require instead practical judgement. No one resolves the kind of environmental conflicts encountered in the North Wales examples by looking for some common measure. Rather, people argue at length, debate, modify reasons for and against various proposals and try to come to some agreement. No one suggests that the resulting decisions are arbitrary or irrational. To appeal to the practical judgement which develops through such discussions is not to appeal to untutored intuition.¹⁷

Judgement of the worth of particular states of affairs can be informed or uninformed, competent or incompetent, tutored or untutored. Good judgement is founded on the existence of capacities of perception and of knowledge based in education and experience. Indeed, it is attempts by economists to force the measuring rod of money or any other unit onto rational deliberations which lead to arbitrariness, contrivance and obstruction of the process of reasoned debate.

To appeal to good judgement, however, is not to deny any role for general principles, technical rules, algorithmic procedures and arithmetic.¹⁸ There is also a role for rules of thumb, standard and default procedures and institutional arrangements which can be followed unreflectively and reduce the role for explicit judgements comparing different states of affairs. But these cannot stand on their own; they have to be the result of lengthy discussion and debate and need to be open to critical appraisal and change.¹⁹

The Bureaucratic Dimension

Cost-benefit analysis does not merely rely on an incorrect conception of practical rationality. To simulate the "optimal" outcomes which would, according to neo-classical economics, be produced by "ideal markets", it also presupposes a type of bureaucracy which discourages the development of institutional arrangements which investigate and encourage deliberation about the *reasons* for people's preferences.²⁰

CBA treats preferences grounded in scientific, communitarian and aesthetic judgements as necessarily on a par with preferences for, say, this or that flavour of ice cream. The intensity of preferences count when they are priced and weighed against each other, but the strength and weakness of the *reasons* given for them do not. Indeed, conflict resolution is expressly required to be conducted *without* rational assessment of and debate about preferences, since this is regarded as undemocratic, on the ground that every preference is just as good as any other. Instead, preferences are inferred by experts either from certain kinds of behaviour or from a sample of non-protesting responses

to a contingent value survey, then inserted into a mechanistic procedures which, when followed, yields a single number.

This view is standardly justified on one of three grounds. First, it is claimed that ethical utterances are merely expressions of preferences, and therefore that preferences are what principles of a public policy should reflect. Second, it is asserted that individual well-being consists in the satisfaction of the preferences people either have or would have if fully informed, and hence that any public policy which is concerned with welfare must address itself to those wants. Third, it is claimed that public institutions should be neutral between different conceptions of the good, and hence should not be concerned with the cultivation of "desirable" preferences, but only with the satisfaction of whatever preferences individuals happen to have.²¹ The alterna-

tive classical view, which conceives of institutions in terms of the pursuit of some particular conception of the good life, is held to be, at best, authoritarian and paternalistic, and at worst, totalitarian.

All three arguments fail. First, even if ethical statements were merely expressions of preferences, this could not rule out a "preference" to assess and

cultivate certain wants and a corresponding public policy.²² Second, well-being is realised not simply by satisfying whatever people's preferences happen to be at a particular time, but also by fostering people's capacities to change their preferences.²³ Third, public institutions cannot be "neutral" in their effects on the preferences individuals happen to have, since they, together with other institutions, help explain the existence of those preferences. Nor should public institutions be neutral with respect to the justification of decisions and procedures, since the value of non-authoritarian and non-paternalistic institutions itself relies upon an appeal to a substantive conception of the good, in particular the value of autonomy.²⁴ Avoiding authoritarian, paternalistic or totalitarian decision-making is not a matter of (mistakenly) assuming that preferences are independent of social context and undertaking to "respect" these preferences by shielding them from discussion while at the same time plugging them into a mechanism regulated by a bureaucracy. Rather, it is to encourage the development of decision-making institutions which respect value pluralism, stress the role of democratic deliberation and practical judgement, and function in a way which cultivates preferences enabling a good life.²⁵

Toward a New Environmental Economics

For environmentalists, the institutional issue should not be one of designing environmentally-responsive institutions on the basis of individuals' current preferences as expressed in market behaviour or in response to surveys. It should rather be one of examining the ways in which institutions define and foster different conceptions of interests. Individuals' preferences and conceptions of their interests need to be the end point of analysis, not its starting point.

Environmental economics needs to move away from concern about commensuration and prices — either real or "shadow" —

"Attempts to force a measuring rod of any kind onto rational deliberations lead to arbitrariness, contrivance and obstruction of the process of reasoned debate."



The Hong Kong Stock Exchange. Attempts to price the environment may suit the market but inevitably lead to conflict. Resolving those conflicts requires discussion and debate about different preferences and values. The forum, not the market, is best suited to this.

and towards an inquiry into the institutional conditions under which individuals are enabled to nurture a concern for the environment and to treat it in a rational and sensitive way. Some central questions to be asked of such an institutional environmental economics are: What institutional frameworks develop a concern for future generations and the non-human world? What frameworks encourage rational argument and debate about environmental matters? What are the institutional conditions of sustainable economic practices? What institutions foster in individuals wider conceptions of their interests that encourages sustainable practices? What institutions and power relationships undermine such conceptions?

Enquiries of this type, while they are ignored by neo-classical economic traditions, are a crucial part of an older, Aristotelian tradition of economics exemplified by the work of Karl Marx and Karl Polanyi, as well as that of US writers earlier this century such as Thorstein Veblen and John R. Commons. One task of this tradition is, in Aristotelian terms, to craft political and social associations which enable every person to act virtuously and live happily²⁶ while limiting the power of the institution of the market, which encourages unlimited acquisitiveness and thus the vice of *pleonexia*, the desire to have more than is proper.²⁷

Such associations, despite the claims of orthodox economists, would treat individual wants with a great deal more respect than do the bureaucracies which perform cost-benefit analyses. They would acknowledge, for example, that preferences for or against flooded wetlands, rhododendrons or the landscaping of quarries are not properties of isolated individuals but can only be properly understood or explained against a specific background of economic history, an irreducible plurality of social practices and locally-rooted communities. Nor would these wants be treated, falsely, as matters of individual taste or as given and fixed. Rather, it would be recognized that they invoke a set of judgements open to appraisal and change by arguments that appeal to criteria independent of personal likes and dislikes. Resolving conflicts involving these preferences,

therefore, would require institutions which encourage discussion of the validity or truth of the reasons for them. The forum, not the market, would become the model institutional form.²⁸

Such a model was and still is key to the Enlightenment ideal of politics. Crucial here is the "freedom to make public use of one's reason in all matters", as Immanuel Kant put it.²⁹ Institutions fostering reasoned dialogue aim not necessarily at compromise but at a shift in judgements. To argue for a belief is to seek to convince; to be open to the arguments of others is to allow oneself to be convinced.³⁰

To raise such topics is to return to problems that were central to eighteenth-century debates on commercial society, whose civic humanist critics were concerned, as environmentalists should be, with the effects of the commercial mobilization of land and labour on links between generations.³¹ In all likelihood, this move would lead analysis away from both market-centred and state-centred approaches to environmental goods and towards a perspective focused on the development of associations which develop a concern for environmental goods.

Even if it turns out that the market and state are the main institutions many of us are stuck with,³² it is the associational background against which they operate that will make the difference as to how far they can operate in an ecologically rational manner.

Notes and References

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6. O'Neill, J., *Ecology, Policy and Politics: Human Well-Being and the Natural World*, Routledge, London, 1993, pp.118-122; Raz, J., *The Morality of Freedom*, Clarendon Press, Oxford, 1986, ch.13. See also *The Ecologist*, "Whose Common Future?", Vol. 22, No. 4, July/August 1992, pp.176-179.
7. That economists fail or refuse to recognize protests against their interpretations of certain kinds of behaviour as revealing "preferences" highlights a connection between the historical use of monetary measures and the assumption of commensurability within economic theory. Karl Marx notes that the presumption in classical utilitarianism that there is a single value to which all others are reducible gains its apparent plausibility from the existence of a single monetary measure for all commodities. The apparent plurality of different goods is, in market practice, treated as if they were reducible to a single value: "The apparent stupidity of merging all the manifold relations of people in the one relation of usefulness . . . arises from the fact that, in modern bourgeois society, all relations are subordinated in practice to the one abstract monetary-commercial relation". See Marx, K., *The German Ideology*, edited by C. Arthur, Lawrence & Wishart, London, 1974, p.109.

8. See Lohmann, L., "Dismal Green Science", *The Ecologist*, Vol. 21, No. 5, Sept/Oct 1991, pp.194-195.
9. Attfeld, R. and Dell, K. (eds.) *Values, Conflict and the Environment: Report of the Environmental Ethics Working Party*, Ian Ramsey Centre, Oxford, 1989, p.29.
10. *Ibid.*, p.30.
11. *Ibid.*, p.35.
12. *Ibid.*
13. *Ibid.*
14. The doctrine of weak commensurability may have similar historical roots to that of strong commensurability. The fact that in the marketplace individuals are forced to make judgements of the form "how much you would be willing to pay for X" and have to engage in monetary comparisons of different goods is taken to entail the existence of a single preference order. For any two distinct items, an individual is supposed to be able to say, "I'd spend more or less on the same on X than on Y." In commodity exchange there is a comparative that orders the commodities. However, to deduce that such a comparative exists in all spheres of life, and is the basis on which all decisions are made, is a mistake. As Aristotle notes, through exchange, objects which "cannot become commensurate in reality" are made to appear commensurable. Marx's argument that, though money, goods and relationships that are often incommensurable in use-value are treated as if they were commensurable in exchange, is sound. It is because neo-classical and much other twentieth-century economics refuses to accept that exchange value is anything except a measure of expected marginal use-value that it makes the illicit move from price commensurability to value commensurability. It is also why it tends to be blind to the social meanings and historical specificity of exchange and of the refusal to put a price on a good. Commensurability in exchange does not entail commensurability of value. Value commensurability is not required for rational decision-making. See Aristotle, *Nicomachean Ethics*, trans. T. Irwin, Hackett, Indianapolis, 1985, 1133b 19.
15. Interestingly, although the assumption that we cannot make rational choices without implicitly pricing or in some other way commensurating the alternatives is largely unquestioned today within the economics profession, it was a subject of critical discussion in the socialist calculation debates of the 1920s and the 1930s. The philosopher Otto Neurath argued against the Austrian economist Ludwig von Mises that a socialist economy would not require a single unit of comparison but would consider only use-value of goods. While physical statistics about energy use, material use and so on would be employed, there would be "no units that can be used as the basis of a decision, neither units of money nor hours of work". Neurath maintained that: "One must directly judge the desirability of the two possibilities . . . The question might arise, should one protect coal mines or put greater strain on men? The answer depends for example on whether one thinks that hydraulic power may be sufficiently developed or that solar heat might come to be better used, etc. If one believes the latter, one may 'spend' coal more freely and will hardly waste human effort where coal can be used. If, however, one is afraid that when one generation uses too much coal thousands will freeze to death in the future, one might use more human power and save coal. Such and many other non-technical matters determine the choice of a technically calculable plan . . . we can see no possibility of reducing the production plan to some kind of unit and then to compare the various plans in terms of such units". Neurath rightly allowed that comparability need not presuppose commensurability, and that non-technical practical judgement plays a necessary role in policy choices. See Neurath, O., "Personal life and class struggle", in *Empiricism and Sociology*, Reidel, Dordrecht, 1928 (1973), p.263; O'Neill, J., "In Partial Praise of a Positivist: The Work of Otto Neurath", *Radical Philosophy*, 74, 1995, pp.29-38.
16. Given an irreducible plurality of values, it is possible for a single individual, perfectly rationally, to prefer A to B and B to C yet also to prefer C to A. Consider, for example, a choice among three environmental sites A, B and C on three values: *u* landscape value; *v* habitat value; and *w* historical value. Suppose that the following ordinal value-assignments hold:
- | | <i>u</i> | <i>v</i> | <i>w</i> |
|---|----------|----------|----------|
| A | 1st | 3rd | 2nd |
| B | 2nd | 1st | 3rd |
| C | 3rd | 2nd | 1st |
- Here A outscores B and B outscores C on two out of three values, yet C outscores A by the same margin. Given that equal weights are assigned to the different values, it is possible to construct a situation in which A is to be preferred to B and B to C, but also C to A. An individual's preferences can thus be intransitive without any failure of rationality. "Rational agents" can find themselves in a situation in which, whatever they choose, there is an alternative which, according to the algorithmic view of choice, should be chosen above it. Here again, value pluralism necessitates that practical judgement plays a necessary role in the resolution of conflicts between values. See Raz, J., op. cit. 6; Kavka, G., "Is individual choice less problematic than collective choice?", *Economics and Philosophy* 7, 1991, pp.143-165; Aristotle, op. cit. 14; Nagel, T., "The Fragmentation of Value" and Williams, B., "Ethical consistency" in Gowans, C., (ed.) *Moral Dilemmas*, Oxford University Press, Oxford, 1987.
17. See, for example, the exchange between Michael Common and Larry Lohmann, Letters, *The Ecologist*, Vol. 22, No. 1, Jan/Feb 1992, pp.39-40.
18. These might involve, for example, techniques which compute the species richness of the fauna of a site or which score the significance of different conservation and landscape components of a particular site.
19. One of the mistakes that defenders of practical judgement tend to make is to set up an opposition between "moral and aesthetic" judgements and the "technical", rule-governed rationality of science. In fact, science, engineering and other technical subjects require the constant oversight of good judgement just as much as ethics and aesthetics do. A veteran fieldworker, for instance, will probably be in a better position to evaluate a site ecologically than a person with a deeper "theoretical" grasp of the principles of ecology but with little experience.
20. Interestingly, CBA's commitment to bureaucracy has opened it to charges of inconsistency from the public choice wing of its own neo-classical economic paradigm. These critics point out that, on the one hand, bureaucrats who employ CBA and politicians who then apply the results are supposed to be benevolent actors concerned with the public interest. (See, for instance, Olson, M., *The Logic of Collective Action*, Harvard University Press, Cambridge, MA, 1965, p.98; Tullock, G., *Private Wants, Public Means*, Basic Books, New York, 1970, p.v.) On the other, according to orthodox economic theory, bureaucrats, like everyone else, are supposed to be narrowly self-interested and are thus likely to concern themselves heavily with "salary, perquisites of the office, public reputation, power, patronage, output of the bureau, ease of making changes and ease of managing the bureau. All except the last two are a positive function of the total budget of the bureau during the bureaucrat's tenure". (Niskanen, W., *Bureaucracy: Servant or Master?* Institute of Economic Affairs, London, 1973, pp.22-3). CBA's own fundamental assumptions lead to the conclusion that the self-interested behaviour of bureaucrats, politicians and voters, if unchecked by institutional reform, lead to the constant expansion of government expenditure and provision, producing outcomes that are irrational and inefficient. On its own assumptions, CBA can get around "market failure" only at the cost of "government failure". While there is much to criticize in this public choice approach, this criticism of the assumption of a benign state apparatus is sound. See Brennan, G. and Buchanan, J., *The Power to Tax*, Cambridge University Press, Cambridge, 1980; Buchanan, J., *The Limits of Liberty*, The University of Chicago Press, Chicago, 1975, ch. 9; Buchanan J. and Wagner, R., *Democracy in Deficit: The Political Legacy of Lord Keynes*, Academic Press, New York, 1977; Niskanen, W., *Bureaucracy and Representative Government*, Aldine-Atherton, Chicago, 1971; and Wolf, C., "Market and Non-market Failure: Comparison and Assessment", *Journal of Public Policy* 7, 1987, pp.43-70. For a discussion, see O'Neill, J., "Public Goods, Environmental Goods and Institutional Economics", *Environmental Politics* 4, 1995, pp.197-218.
21. Austrian adversaries of the neo-classical paradigm such as Mises share with neo-classical theorists the assumption that any principle of "optimal" outcomes must merely take as a given the wants people happen to have, concerning itself only with their most efficient satisfaction. See Barry, B., *Political Argument*, Harvester Wheatsheaf, New York, 1990, (2nd ed) p.38.
22. O'Neill, J., op. cit. 6., pp.64-5.
23. Aristotle, *Metaphysics*, Clarendon, Oxford, 1957, 1072a 29; O'Neill, J., op. cit. 6., pp.65-82.
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25. Sagoff, M., *The Economy of the Earth*, Cambridge University Press, Cambridge 1988; O'Neill, J., op. cit. 6., chs.5-7; Mill, J.S., *Representative Government*, (new edn) Routledge, London, 1861. p.29.
26. Aristotle, *Politics*, trans. E. Barker, Oxford University Press, Oxford, 1948, 1324a 22, 1280b 38f.
27. Aristotle, *ibid.*, Book I, chs. 8-9; Polanyi, K., "Aristotle Discovers the Economy" in Polanyi, K., *Primitive, Archaic and Modern Economies*, Beacon Press, Boston, 1957.
28. Meikle, S., "Aristotle and the political economy of the polis", *Journal of Hellenic Studies* 79, 1979, pp.57-73; and O'Neill, J., "Egoism, Altruism and the Market", *The Philosophical Forum*, 23, 1992, pp.278-288.
29. Elster, J., "The market and the forum: three varieties of political theory", in Elster, J. and Hylland, A. (eds.), *Foundations of Social Choice Theory*, Cambridge University Press, Cambridge, 1986.
30. Kant, I., "An Answer to the Question 'What is Enlightenment?'" in Reiss, H., (ed.) *Political Writings*, Cambridge University Press, Cambridge, 1991.
31. This is not to insist, as Jürgen Habermas does in his conception of rational public life, that in a debate free from coercion, beliefs would necessarily converge. In the best of all possible conditions, reasonable interlocutors could find themselves at the close of argument tied to their respective opposed positions: dialogue may succeed in arriving not at agreement, but in each appreciating the reasonableness of the opposing view, while remaining committed to their own.
32. Pocock, J., *The Machiavellian Moment*, Princeton University Press, Princeton, 1975; and *Virtue, Commerce and History*, Cambridge University Press, Cambridge, 1985.
33. There are those of us who retain the possibly utopian hope that this is not our permanent social predicament.

Deforestation in Tanzania

Beyond Simplistic Generalizations

by

Solon L. Barraclough and Krishna B. Ghimire

Using national-level data, many analysts frequently blame deforestation in tropical countries on a country's population growth and poverty. Detailed, local-level case studies in Tanzania, however, reveal that the relationships between population dynamics and environmental degradation are much too complex to support reductionist generalizations about cause and effect. In one lowland rural area, large population increases led to more tree cover, while in a lightly-populated region, there has been rapid deforestation. In another degraded area, a conservation project rehabilitated deforested land by excluding local pastoralists and farmers — which resulted in social and ecological problems elsewhere. The principal impetus to deforestation in the country has come from world markets and state policies.

Nearly half of Tanzania, a country of some 94.5 million hectares, could be considered forested. Almost 98 per cent of this forest is *miombo* woodlands which cover most of the western and southern part of the country and range from rather dense closed forest to open woods in drier regions, blending into bushlands and grasslands.

Only about 1.4 million hectares of moist, closed tropical forest remain in Tanzania on the upper slopes of mountains, especially in the southern highlands and near the north-eastern coast; the East Usambara mountains support one of the richest biological communities in Africa. There are also 80,000 hectares of closed mangrove forests along the country's east coast bordering the Indian Ocean, 60 per cent of all remaining mangroves in East Africa.

There are no reliable data on recent deforestation in Tanzania; estimates that 300,000-400,000 hectares are being cleared each year have been repeated for over two decades. The UN Food and Agriculture Organization, however, puts overall deforestation in Tanzania at about 0.3 per cent annually and twice this rate in the humid tropical forest and mangrove areas.

The number of people in Tanzania, meanwhile, is estimated to have increased six-fold since 1913 when the population was about four million, reaching 25 million in 1990. Although urban population growth has been rapid, four-fifths of Tanzania's population still lived in rural areas in 1990 and were for the most part agricultural.¹ Population increases and densities are unevenly distributed throughout the country.

Intense population pressure on available land resources is usually blamed for the country's deforestation. However, case studies of the interactions between local institutions, markets and state policies over several decades in three areas — a district in the Usambara mountains, a delta near the capital, Dar es Salaam, and a semi-arid area in the centre of the country — reveal this to be a simplistic generalization.

Land Scarcity in the Western Usambaras

Several centuries before German colonization in the late nineteenth century (see Box, p.106), settlers began to clear the Usambara mountain forests to expand and intensify agriculture.² A gradual population increase in the area was in part due to successive waves of migrants who fled there to avoid widely-feared warriors such as the Maasai; the mountainous terrain facilitated defence and had a moist and sub-tropical climate with several areas of good soils.

The agricultural systems the people used protected soils from erosion, improved water retention and protected biodiversity. For example, the most common *shambaa* farming system resulted in multi-storeyed vegetative cover similar to the forest it had replaced. Taller trees which yielded edible fruits and seeds dominated the canopy while the understorey consisted of bananas (a principal food crop) and vines yielding various useful foods and other products. Scattered patches were planted with yams, beans and other garden crops.

During German and then British colonialism, about one-third of agricultural land in the Lushoto district of the Usambaras was appropriated by European settlers to grow coffee, tea, sisal and other plantation crops. The colonial authorities gradually incorporated other areas into forest reserves so that by the time of independence in 1961, some 107,000 acres (13 per cent of Lushoto district) was demarcated. Colonial foresters' concern with deforestation had led as early as 1895 to the enactment of various forest protection laws, which prohibited forest clearance on hilltops, steep slopes and along valley waterways, and the establishment of a game reserve. By 1961, over two-thirds of Lushoto became unavailable for agriculturists and pastoralists who constituted the bulk of the population.

This land alienation occurred at a time when the local population was growing: the number of inhabitants in Lushoto district almost tripled between 1948 and 1988 from 128,000 people to 357,000, most of them living in the rural areas. Compared with the previous century, little of this increase was due to in-migration; in fact, many young men were leaving the

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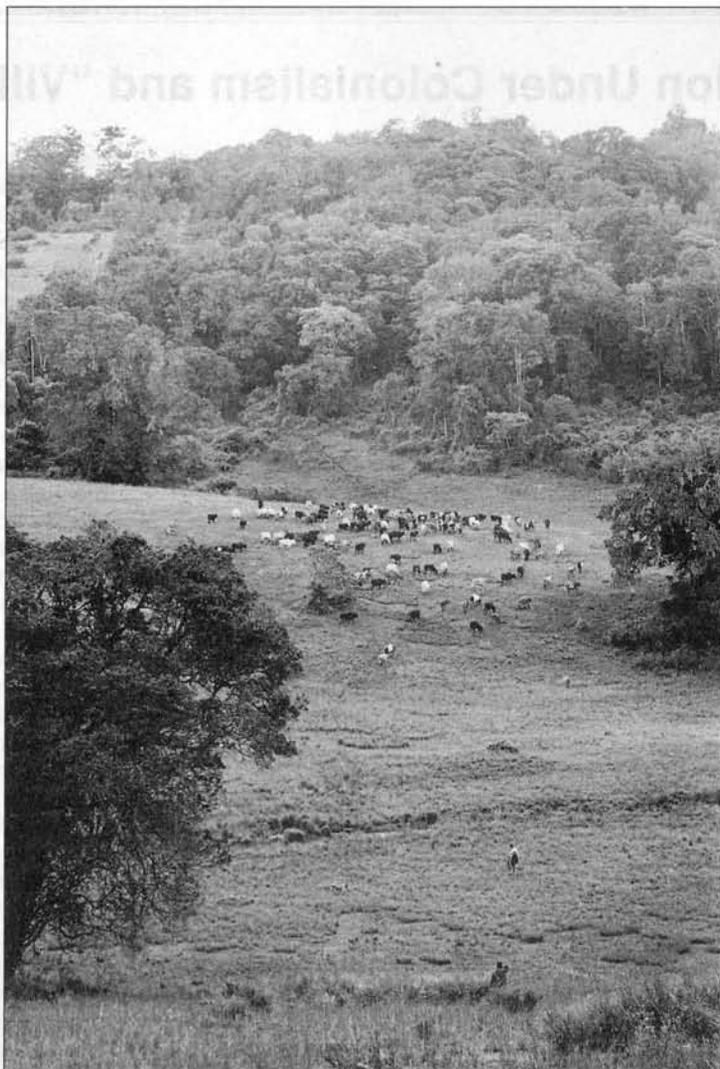
area to find employment in the capital, Dar es Salaam, in the town of Arusha, and elsewhere. Improved health services contributed to a lower mortality rate, but there were also economic incentives for peasant families to have more children, such as increasingly labour-intensive farming practices and a need to deploy family members as migrant labourers to top up family finances. Population densities in the district ranged from less than 30 persons per square kilometre in some municipalities to over 300 in others, variations due partly to patterns of land tenure and partly to differences in productive capacity because of different soils, topography, rainfall and histories.

A tripling of the peasant population combined with a two-thirds reduction in traditional farm land and a lack of livelihood alternatives led to growing pauperization. Catastrophic deforestation, however, did not occur, largely because the peasants adapted their production and consumption systems to the scarcity of land.

Many peasants intensified their farming practices, using less land and more labour. Some began to produce fruits and vegetables for sale in the expanding urban markets of Dar es Salaam, Arusha and nearby Kenya. Traditional irrigation systems were repaired, while terracing and bunding became more widespread. Many peasants planted trees for their fuel, fodder and construction needs. Some peasant cultivators turned to livestock raising, previously the prerogative of only a few ethnic groups. They stall fed higher-quality animals rather than grazing them in open pasture, a practice which provided more manure for fertilizer.

Peasants adjusted their consumption patterns as well. Maize, potatoes, cassava, yams and beans became more important in local diets, gradually replacing traditional foods such as millet, bananas and animal products, which were not so high-yielding. Those who produced for the market began to consume more purchased foodstuffs. New house construction depended less on wooden poles and thatch and more on mud, grass and bricks. Most families curtailed their use of fuelwood.

Peasant adjustment to land scarcity was aided by government



Maasai herding cattle. Various ethnic groups in the Usambara mountains of Tanzania used to share their lands with pastoralists, particularly the Maasai from Kenya and northern Tanzania. The Maasai cattle were allowed to eat grass and crop residues and in return left manure to fertilize the next season's crops. As land was appropriated for export crops and game and forest reserves, the pastoralists' traditional pastures and watering places were severely curtailed. The highlanders no longer had enough land for their own needs, let alone land to share. As the Maasai were squeezed into smaller, often semi-arid areas with inadequate water sources for their cattle, they were forced to reduce their herds and grazing areas. Thus their food security declined.

programmes.³ The government's Lushoto Integrated Development Project, initiated in the mid-1960s, encouraged the marketing of vegetables, improved dairy production, and helped to spread better brick-making techniques and various other activities. A Soil Erosion Conservation Agroforestry Project followed in the 1980s, promoting soil conservation practices, intensifying agricultural production and providing seedlings and technical assistance. Although conflicts were generated when these programmes did not take local cultural norms (such as customary land tenure) sufficiently into account, the post-independence state was usually supportive of customary farming systems and land rights.

Forest Destruction in Rufiji

In Rufiji, a 1.3 million hectare delta area some 150 kilometres south of Dar es Salaam which is 90 per cent forested and includes half of Tanzania's mangroves, a very different picture emerged.⁴

Rufiji district is lightly populated with about 150,000 people and a population density of about 11 persons per square kilometre, only one tenth that of the peasant farming areas of Lusotho. Because of out-migration, population growth has been slow in Rufiji since 1948; during the 1980s,

the total number of people actually decreased. Although much of the delta has good agricultural potential, less than four per cent of the district was cultivated in the early 1980s. Most of the agriculture was of rice, cassava, maize and other foods for self-provisioning, but cashew nuts and cotton were also grown as cash crops.

One of the most important sources of cash income timber sold as logs, charcoal, construction poles and fuelwood. Wood and timber extraction and processing employ over one-fifth of the district's workforce. Over half the forest products are taken from the 40,000 hectares of rich coastal mangroves which have been heavily overcut since the 1970s.

The immediate cause of indiscriminate deforestation has been the lucrative markets for timber, wood and charcoal in Dar es Salaam, a city which increased in population from 70,000 in

Deforestation Under Colonialism and "Villagization"

As in other parts of Sub-Saharan Africa, land in Tanzania belonged primarily to different ethnic groups or clans. It was allocated by a chief or elder responsible for land rights, to be worked or grazed by the community, family groups or individuals. Access to land was a birthright of all clan members.

Tree tenure was usually distinguished from land tenure, especially if the trees had been planted or tended for a particular purpose.

Clans dedicated principally to livestock raising could hold complementary tenure rights for grazing during certain periods on lands belonging to agriculturists. Clans might have been under the protection of a central authority or chief to whom they paid some tribute, but the principal property rights to land rested in the clan, which had the right to exclude outsiders or grant them access under certain conditions. Members of the clan usually had the duty to observe customary rules of land use and of distribution of its products.

European Colonization

Land tenure was disrupted when Germany colonized Tanganyika in the late nineteenth century (the country joined with the island of Zanzibar after independence to become Tanzania). Moist tropical forests were three or four times more extensive than they are now. The colonial administrators promoted export crop plantations of coffee, tea and rubber which required soils and climates similar to those of the moist forests. White settlers were attracted to the highlands because of the pleasant, healthy climate. Other densely-forested areas were cleared for the production of sisal.

To facilitate crop exports, the colonial authorities constructed roads, railways and port facilities. The Germans built a central 1,600-kilometre railway through the country which caused much deforestation, as did the construction of the Tanzania-Zambia railway (TAZARA) half a century later.

In coastal areas and along the central railway, several hundreds of thousands of hectares of woodlands were cleared for sisal plantations. By 1954, sisal plantations covered about 300,000 hectares and employed about the same number of workers. The

country became the world's largest sisal exporter.

Besides establishing their own plantations, the colonialists also attempted to induce and coerce peasants to produce for the market, especially for export. To do so, they had to bring about many profound alterations in land use, agricultural practices, work habits, land tenure and social relations more generally, both within and between existing communities.

The colonial administrators regarded any land that was not occupied or cultivated as "vacant", and disposed of these areas as they wished. Yet peasants frequently left much of this "vacant" land fallow for long periods to allow soils to renew their fertility under forest or other vegetative cover, while they used other "vacant" forest lands for hunting, grazing, and gathering useful plants and other products.

In addition to plantation crops in the moist forest region, extensive drier wooded areas were cleared for cotton and tobacco. Tobacco plantations had to be rotated frequently, while curing required vast amounts of fuelwood.

All these deforestation processes continued when the country became a British protectorate after the First World War. A failed attempt by the British to turn Tanganyika into a major groundnut exporter caused deforestation in some districts in south and central regions.

More successful was the promotion of cashew-nut cultivation in the south where local agriculturists used cheap migrant workers from Mozambique to plant large areas with cashew trees. This made a few peasants relatively wealthy as these trees became the individual property of the planter, increasing social differentiation in the area. Developments such as these meant that throughout the country, rules regulating land tenure, production and distribution began to break down.

Villagization

Following independence in 1961, land became state property, supposedly to be allocated and used for the benefit of all. In practice, large private plantations and farms owned by Europeans, as well as other foreign-owned properties and businesses, were nationalized (with a few exceptions). Traditional land tenure systems remained dominant in extensive rural areas except in parks and game reserves.

In the early 1970s, President Julius Nyerere launched a resettlement programme called Ujamaa, aimed at grouping

dispersed rural people in villages. This had a negative ecological impact in many rural areas. "Villagization" was meant to provide rural people with amenities such as water, sanitation, schools, housing, social centres and the like, while facilitating the introduction of modern agricultural inputs, tools and practices, along with better marketing and cooperative organization. By 1975, some nine million rural people were living in nearly 7,000 villages compared with half a million people in 2,000 villages just five years earlier.

However, the programme was very uneven in its implementation; while some of this massive movement of people was voluntary, there were coercive pressures in many cases. The selection of sites selected for villages were frequently based on inadequate information about their natural resources and their potential uses. The result was serious environmental degradation in some instances. (Land use planning is now for the most part decentralized)

Villagization often disrupted customary production and social systems. It was sometimes a direct cause of accelerated deforestation, as the new settlements required construction material and fuelwood — previously gathered and distributed over a wide area by dispersed groups — to be concentrated in a few small areas. Land-use assessments and planning for the villages were often patchy, leading to cultivation and heavy grazing of areas that were unsuitable for such intensive uses. Government attempts to promote agro-forestry systems and community forestry in villages led to highly variable outcomes.

Although the villagization programme brought social and economic benefits to rural people in some cases, in others the social consequences were perceived by the relocated peasants as harmful. Villagization was a coercive violation of customary tenure rights, even though its aim was supposedly to strengthen and modernize traditional social and production systems. There was considerable opposition by villagers who could not follow the logic of moving to a village to be near services and markets that they used only occasionally instead of continuing to live near crops and animals requiring daily attendance. Today, while many relocated rural people have remained in the villages, others have returned to live near their fields, often leaving part of their families in the villages.

1948 to 1.4 million in 1988. Whereas producer prices for cashew nuts in Rufiji district increased by 40 per cent during the 1970s and cotton prices by 100 per cent (only to fall again in real terms in the 1980s), the producer price of charcoal went up by over 400 per cent, as did pole and timber prices.

But attractive prices for timber, wood and charcoal do not fully explain why local people began to mine the mangroves, after having exploited them prudently for many generations. Also significant was the breakdown of customary land tenure and production systems as a result of "villagization", the post-independence government's programme of enforced resettlement of scattered rural people into government-planned villages (see Box, p.106).

The first villagization programme in Tanzania began in Rufiji district in 1969 when flood victims were resettled in the delta. Customary tenure was in theory respected but in practice village boundaries were seldom clear. Long-established farming systems were disrupted and social differentiation increased. The government took legal ownership of the mangroves and included them in Rufiji's 143,000 hectares of state forest reserves, but it did not have the resources to protect or manage them. Many young people left to work in the capital, leaving communities short of able-bodied workers. Remaining villagers found mining forest resources, particularly those on government lands, the easiest way to earn their livelihoods. Customary rules governing forest exploitation were simply undermined by new lucrative markets, insecure forest tenure and social disruption. Merchants and some public officials who stood to gain did what they could to persuade local authorities that they too could benefit by destroying their forests.⁵

Deforestation and Desertification in Kondoa

Many of the complex interactions between land appropriation, demographic change and colonial and post-independence politics are illustrated by Kondoa in central Tanzania.⁶ The district is frequently cited as a classic example of deforestation and desertification caused by population growth and supposedly careless pastoral and cultivation practices. Over half the district's 1.4 million hectares are badly eroded. Highly-visible land degradation — spectacular deep gullies, sand rivers and parched earth — has made Kondoa a target of conservationist interventions by successive colonial administrations, the independent state and foreign donors.

The moister highlands were once largely forested, but now less than one fifth of them support *miombo* woodlands. Rainfall averages only about 600 millimetres annually, is unreliable and is concentrated in a short rainy season. Before human settlement, the drier plains and lower hills were covered by grasses and bushes with scattered patches of woods.



Tea is one of Tanzania's major exports. The most rapid and extensive deforestation in Tanzania in recent times took place during the colonial period, when large tracts of tropical forest were cleared for plantations of such export crops.

Land degradation seems to have accelerated in the mid-eighteenth century, when an important trading route from the east coast to Lakes Victoria and Tanganyika crossed Kondoa to avoid the Maasai. Caravans often numbered over 100 members. Kondoa settlements became important provisioning depots for the traders and extensive forested areas were cleared to cultivate grain for them. Other forests were exploited to supply charcoal for iron smelting to furnish the caravans with tools and utensils. The traders' demand for *vyome* (bark containers for grain storage) contributed still further to deforestation.

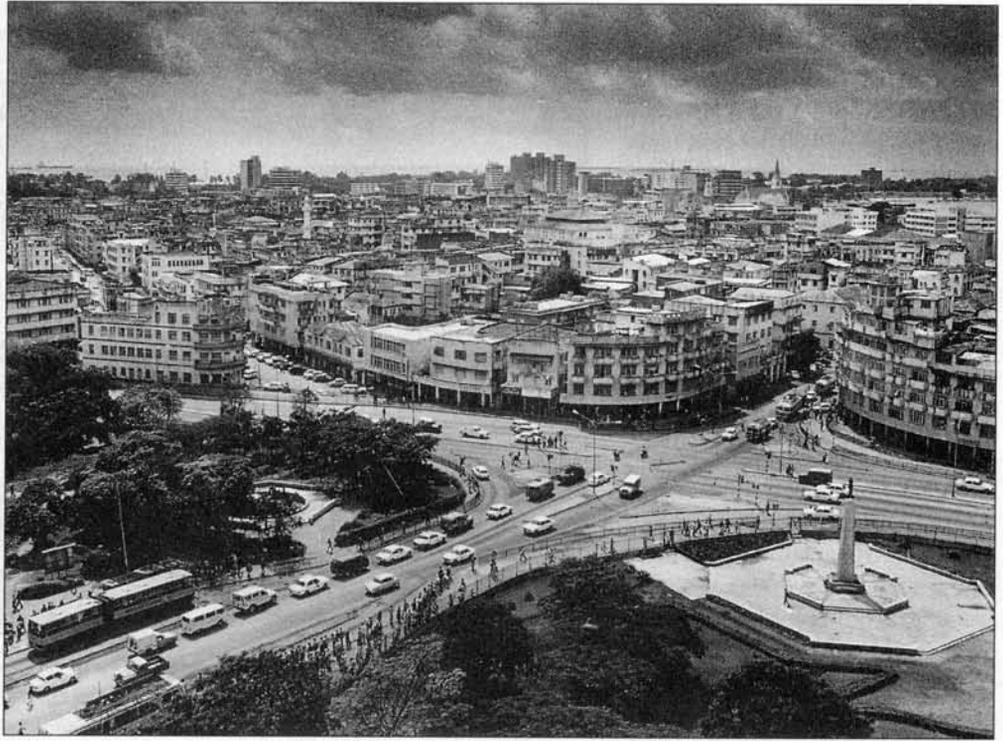
Strategic settlements of Arabs and Waswahili arriving from the coast also grew. These immigrants converted many of the indigenous Rangi of Kondoa to Islam, used slaves to extend the area of cultivation and frequently appointed Waswahili as village headmen and tax collectors. All these processes weakened customary social-institutions and values. The Rangi gradually abandoned many of their pastoral and agricultural practices which had been protective of soils and trees and lost control over their management of their natural resources.

In the late nineteenth century, a rinderpest epidemic decimated livestock in the district. The Rangi's cattle, which constituted their accumulated wealth, their insurance against bad years and their principal status symbol, were wiped out. This disaster coincided with the German colonial conquest, which was particularly harsh and ruthless in Kondoa. The district had few natural resources of commercial interest to the colonialists, but instead became an important source of forced labour for colonial projects elsewhere. During the First World War some two decades later, Kondoa became a battlefield between British and German armed forces. Both sides looted local grain supplies. The Germans' scorched-earth tactics during their retreat caused further environmental damage.

Around this time, many Rangi fled to the highlands and cleared the wooded areas for subsistence cultivation to escape fighting, conscription in the German army, or the sleeping sickness carried by the tsetse fly, which had begun to spread southwards into Kondoa following large-scale brush encroach-

Dar es Salaam, the capital of Tanzania on the Indian Ocean. An important cause of recent deforestation in the country has been rapid urbanization due to rural depopulation.

Ron Gilling/Panos Pictures



ment associated with the rinderpest epidemic, colonial labour exploitation and war.

After the war, containing sleeping sickness became a high priority for the new British colonial administrators of Kondoa. They undertook a major programme of brush clearance in infested areas of the hills and plains to facilitate resettlement from, and destocking in, the badly-eroded highlands. They also imposed labour-intensive soil conservation practices such as ridge cultivation, contour banking and reforestation. These measures did not take adequate account of the Rangi's customs and livelihood concerns, but the Rangi were too weakened to resist collectively. Some responded to harassment by the colonial officials with apathy, others by migrating to other regions. A net ecological result of the British administration's conservation interventions was to slow land degradation in the highlands but to accelerate it in the lowlands.

In the 1960s and early 1970s, several severe droughts forced many peasants of Kondoa to move once again to the highlands. Renewed deforestation and erosion as well as food shortages impelled the government to make Dodoma region (of which Kondoa district was a part) the second area of villagization in 1972. The Dodoma Land Rehabilitation Programme (HADO) was established in the district in 1973, with substantial financial and technical support from Sweden, to rehabilitate its soils and forest. The programme's approach was in many ways similar to that of the British land rehabilitation effort in the 1930s. It emphasized cattle destocking, soil conservation measures such as contour banking and tree planting for shelterbelts, agroforestry, and village woodlots. In severely eroded areas, cattle were excluded, effectively evicting their owners as well. Like the earlier efforts, HADO was a top-down and technocratic project with little real participation by the local people in setting goals or in designing and implementing the project.

The HADO programme did demonstrate that eviction of people and cattle could contribute to the restoration of vegetative cover on some degraded semi-arid lands within a relatively

short time — but such a narrow technocratic approach only exported problems elsewhere.⁷

Challenges and Blame

These examples from Tanzania suggest that even in the absence of increasing numbers of people, forest degradation and deforestation will continue in developing countries as long as other conditions remain more or less the same. In Tanzania, demographic change (migration as well as birth and death rates) is only one aggravating factor among many. No intense population pressure on available land resources, which could have caused massive deforestation at national levels, existed. Deforestation has been primarily driven by public policies since colonial times that stimulate the expansion of agro-exports, commercial logging and massive land alienation.

Customary land tenure systems, while still influential in Tanzania, are vulnerable to disruption, depending on the extent of commercial activities, social differentiation and state land policies. How the land is used and cared for depends on the political alliances and conflicts between customary authorities and those of the national state.

A major challenge now in Tanzania is to ensure that rural communities retain relative equity in access to land, concern for environmental protection and the decentralized local management that customary land systems usually embodied. At the same time, policies are needed which enable local people to adapt and protect themselves in a rapidly-changing and usually hostile socio-economic environment. Meeting this challenge will not be facilitated as long as "experts" identify customary farming systems, poverty and population growth as the main causes of deforestation.

This article is an edited extract of *Forests and Livelihoods: The Social Dynamics of Deforestation in Developing Countries*, Barraclough, S.L. and Ghimire, K.B., MacMillan, London/St. Martin's Press, New York, 1995.

Protection and Plantation

The setting aside of land in what is now Tanzania for conservation and recreational purposes started during the German colonial period, when foresters became concerned about rapid deforestation. The expansion of protected areas continued under the British and after independence.

Today, nearly five per cent of Tanzania's 45 million hectares of forest land are classified as strictly protected. Another 29 per cent are in forest reserves while the remaining two-thirds are classified as public forest lands. Local people are usually excluded from farming, grazing, hunting or otherwise using protected areas in customary ways. This has generated many conflicts over the years between local people and park, game and forest reserve authorities.

Under Tanzania's present decentralized authorities, the central government's administrative structures for natural resource control and other functions are replicated in each region. While all land is legally state property, central government officials have to go through a regional director to contact a regional officer. Within each region, local governments (district councils) have considerable authority, including the power to levy taxes on the use of forests and other natural resources. Within the districts, villages have usufruct rights to their lands and considerable discretion in their use. Village-controlled forest boundaries, however, are seldom clear.



Mangroves in Tanzania.

Given this four-tier administrative structure — centre, region, district, village — central government foresters have little scope for influencing management of the 29 million hectares of public forest lands or the 13 million hectares in forest reserves. In most cases, responsibility for their management reverts to regional governments or, in some instances, districts or villages. In addition, the national forestry service (the Forest and Beekeeping Division (FBD) of the Ministry of Tourism, Natural Resources and the Environment) has only some 500 techni-

cians and professionals — one for every 90,000 hectares of forest land in Tanzania.

However, the FBD has achieved a degree of managerial control over a few of these reserved forests by declaring them special attention zones and obtaining funds from foreign aid agencies. In 1989, it was able to assert control over 80,000 hectares of mangrove and some reserves of closed forests in the Usambaras.

Tanzania also has some 150,000 hectares of plantations, over half of which are in national forest reserves. Softwoods (*Pinus* and *Cupressus*) predominate and current sustainable yields (if they were to be harvested) exceed effective industrial demand by about one third.

The German colonialists established the first plantations of exotic species such as eucalyptus. The colonial and post-colonial state encouraged both broadleaf and coniferous plantations to meet anticipated demand for

timber and fuelwood. They may also have been motivated by bureaucratic dynamics and a need to create rural jobs. Teak plantations in the north-east were apparently planted to meet a brisk demand.

In fact, where planting is undertaken in anticipation of future markets, demand has proved insufficient for much of the timber grown. Projections of national global supply and demand for timber may have little to do with the realities of markets for particular products in particular places.

Notes and References

1. This estimate is from national sources. The World Bank estimated in 1992 that 33 per cent of the population was urban. See World Bank, *World Development Report 1992*, Oxford University Press, New York, 1992.
2. See Mascarenhas, A. and Maganga, F.P., "Land Scarcity and Deforestation in the Western Usambaras", paper presented at UNRISD workshop on Social Dynamics of Deforestation in Developing Countries, Nanyuki, Kenya, 15-19 July 1991. Significant deforestation took place in the Usambara mountains about 2,000 years ago when several areas were partially cleared to provide wood and charcoal for iron smelting. When iron production in the region declined, the forests recovered.
3. In retrospect, these programmes were sometimes rather ineffective and contradictory. The villagization programme had little disruptive impact in the district as most rural people were already living in villages.
4. Mascarenhas, A., "Deforestation by Proxy in Rufiji District", draft report prepared for UNRISD, July 1991.
5. Villagization also contributed to the breakdown of cashew nut production. Because owners had to travel long distances to tend and harvest their trees, many abandoned their cashew orchards and cut their trees to make charcoal.
6. Mascarenhas, A., "Ecology and Deforestation in Semi-Arid Kondo District, Tanzania", draft report prepared for UNRISD, 1992.
7. The HADO programme also suggested that genuine popular participation of the various local groups in the area could have helped make it more successful in meeting social as well as strictly environmental objectives. Indeed, the government and donors recognized this in the HADO 1986/87-1995/96 second phase master plan. The historical record from the eighteenth century onwards, however, suggests that achieving effective democratic participation for indigenous people on terms equal to those of aggressive coveting their land, trees and labour is a long way from being exclusively a local issue.

Creeping Enclosure

Seed Legislation, Plant Breeders' Rights and Scottish Potatoes

by

Tracey Clunies-Ross

GATT and other international agreements have greatly extended the powers of plant breeders. In many countries, the holders of "plant breeders' rights" now have almost total control over the reproductive material (mainly seeds) generated from plant varieties they have "developed". Not only can they charge royalties on "their" seeds, but they can also decide who should grow them and to whom the crops should be sold. Southern farmers have been assured that subsistence crops will not be affected by new legislation; in theory, this is true, but experience in Britain suggests that, in practice, it may not be.

Farmers are as dependent on their seed supply as they are on moisture, soils and sunlight. Keeping seed from one year's crop from which to grow the next has been a tradition worldwide. The new GATT agreement, however, stipulates that signatory countries introduce legislation to protect, "either by patents or by an effective *sui generis* system or by any combination thereof",¹ the interests of those who develop and sell new plant varieties.² In practice, this means that exclusive property rights over reproductive material, mainly seeds, will be granted to private companies. The implementation of international agreements, such as the 1991 International Convention for the Protection of New Varieties of Plants (*see* Box, p. 112), will mean that rights' holders will be able not only to extract royalties for the use of "their" seeds, including farm-saved seed, but also to maintain or withdraw seed varieties from the market and to restrict access to the crop.

Assurances abound that such patenting systems will not affect subsistence farmers in the South. The former Director-General of GATT, Peter Sutherland, wrote in the *Times of India*:

"There are worries that the farmer will lose access to seeds as the price goes up, that he will not be able to save his seeds for the next crop, or exchange seeds across the fence with his neighbour, as he has been doing for ages, and that generally he will be in a state of dependency on the plant breeder. These concerns are largely unfounded."³

Similar assurances were given several decades ago when plant breeders' rights and royalties on seeds were introduced in Britain and the European Union. Because these new concepts did not seem to have far-reaching implications, they were not significantly opposed. In the past few years, however, some plant breeders have begun to exercise their rights more extensively to the detriment of the livelihoods of certain groups of farmers.

Seed potato growers in Scotland, for example, did not envisage 30 years ago that they would now only be able to grow

certain varieties of potato under contract to the rights' holders of those varieties. Their experience suggests that assurances about the intentions of legislators or plant breeders, even those given in good faith, count for little if rights are introduced which govern access to seeds and reproductive material, including farm-saved seed.

Regulating Seed in Britain

Up to the last century, most farmers in Britain obtained seed by saving it from their previous year's crop and by trading seeds of different crops and varieties with other farmers. Even today, about 30 per cent of seed in Britain may be "farm saved" whilst in southern Europe, the figure is as high as 80 per cent for many crops. In the Third World, only a minute portion of the seed supply is *not* gathered by farmers from the previous year's crop.⁴

In much of Britain and the European Union, however, there has been a gradual transition from dependence on farm-saved seed to reliance on seed produced by professional plant breeders and specialist seed growers.⁵ The growth in the plant breeding industry has been accompanied by legal controls over the development, sale and reproduction of crops. Although in Britain it was an offence as early as 1869 to sell any "killed or dyed" agricultural or garden seeds with intent to defraud, and a certain measure of control was exercised in Ireland from 1909, it was the threat of food shortages during the First World War which stimulated more comprehensive seed control measures.⁶

The 1920 Seeds Act, designed to protect commercial, seed-buying farmers, growers and gardeners, required a seed seller to disclose certain information about their seeds, such as analytical purity and germination rate.⁷ All seeds had to carry the name and address of the seller and to name the kind of seed (for instance, wheat or barley or pea). Certain kinds of seeds (principally cereals and certain clovers) also had to carry the name of the variety. No minimum standards were set, nor was any legal restriction set on a buyer's choice of seed.

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Sir Walter Raleigh overseeing the first planting of the potato in Ireland. Descended from just a few plants, the potato's genetic base in the British Isles remained narrow until the mid-nineteenth century when the genetically-uniform potato crop withered and rotted away because of blight, resulting in the Irish Famine. Thereafter, other, genetically-diverse varieties of potato from abroad were introduced by plant breeders on whom farmers have become increasingly dependent.

By the 1950s, however, emphasis began to shift away from protecting buyers of seeds towards protecting and encouraging plant breeders and sellers. It was thought necessary to provide incentives to farmers to use new varieties developed by plant breeders and to discourage them from using "unsuitable" ones by keeping the seeds of such varieties off the market.⁸

Thus the 1964 Plant Varieties and Seeds Act provided for "the granting of proprietary rights to persons who breed or discover plant varieties and for the issue of compulsory licences in respect thereof".⁹ The Act states that "the holder of plant breeders' rights in a plant variety shall have the exclusive right . . . a) to sell the reproductive material of the plant variety; b) to produce the reproductive material of the plant variety in Great Britain for the purpose of selling it".¹⁰

"Sale" of reproductive material was interpreted to mean *any* kind of distribution of the crop to others who will use it to grow further crops.¹¹ In practice, the legislation means that reproductive material cannot be sold, given away or shared in any way at all without the consent of the holder of the rights. The Act also allowed the holder of plant breeders' rights to "impose any conditions, limitations or restrictions", just as with any holder of any kind of proprietary rights.¹²

Thus the holders of rights over plant varieties can, if they choose to exercise their rights, have almost total control over the reproductive material: they can decide who should plant seed or "multiply it up", whom farmers can buy their supplies from and whom they can sell to.

Plant breeders' rights in Britain are now held in fewer and fewer hands, as small, often family-owned, seed firms and government-run breeding programmes have been taken over by large, private companies. Among the first corporations to take an interest in buying or developing seed companies were those involved in grain trading (in which the means of production are also the end product for consumption); these included Rank Hovis McDougall, Dalgety Spillers and Cargill. From the 1970s onwards, other multinational giants ranging from Shell Oil to ITT moved in to "buy or otherwise control nearly a thousand once independent seed companies".¹³

Seed Potatoes in Scotland

For Scottish seed potato producers, the impact of this concentration is already becoming severe. A few companies, including Nickerson Seeds, Scott and Newman, and Cullen Allen, now have the rights over the reproductive material of many popular potato varieties and have begun to prevent growers and merchants from buying and selling reproductive material to each other.

Unlike grains or vegetables, which are reproduced through cross-pollination and seed-planting, the most common way of producing successive generations of potatoes is to multiply them up vegetatively.¹⁴ The tubers are harvested, checked for disease, graded, sold and replanted as seed potatoes from which the next generation is produced.

In areas of suitable soils where disease can be minimized, large numbers of farmers concentrate on producing seed potatoes. The farmers then sell them on, for instance, to farmers in England who want to plant them to produce a crop (known as "ware") for sale to the public. Some 14,338 hectares of Scotland are used for growing potatoes.

Under the 1964 Plant Varieties and Seeds Act, plant breeders gained rights over new varieties of potatoes for 25 years (extended to 30 years in 1992). These are known as controlled or protected varieties.¹⁵ Other varieties — those in existence before the introduction of plant breeders' rights and those for which the 30-year period of protection has expired — can still be freely bought, grown and sold.

After the Act was introduced, seed potato growers started to pay a royalty on the crop but were not restricted in other ways. They could still buy their stock "over the fence" from other growers or specialized merchants and intermediaries, grow them as seed potatoes to the specified standard and then sell the harvested reproductive material to whomever they wished.

Inspections were introduced by the Ministry of Agriculture, Food and Fisheries (MAFF) to ensure that seed potatoes conformed to purity standards laid down in the 1964 Act. The growers had to pay for tests and inspections, a requirement

Regulating the Seed Trade Internationally

Legislation in Britain has conformed with international moves to regulate the seed trade and grant plant breeders more protection. The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) was signed at a 1961 meeting in Paris. Under this agreement, many industrialized countries promised to "acknowledge the achievements of breeders of new plant varieties, by making available to them an exclusive property right, on the basis of a set of uniform and clearly defined principles". The Convention was revised in 1972, 1978 and 1991. Most of the 30 members of UPOV have agreed to be bound by the 1978 version of the Convention which came into force in 1981. (The 1991 amendments have not yet been implemented.)

Under the 1978 Convention, signatory governments are required to provide protection for varieties which are distinct, sufficiently homogeneous, stable and "new" in that they have not been sold on a commercial basis before certain dates. Member states do not have to require that all plant species be eligible for protection, and there is acknowledgement of the right of farmers to replant and exchange the seed of protected varieties, as well as a research exemption which allows protected material to be used for research purposes.

The United States, Australia and the EU are now all amending or have amended their national legislation to conform to the 1991 UPOV Convention, which will enhance plant breeders' rights still further.

The 1991 Act requires signatory states to permit protection for *all* plant species and kinds, not just specified ones, and extends the period of

protection from 15 years to 20 to 25 years. It extends breeders' rights to "essentially-derived varieties" (those very closely related to varieties already protected) and removes the 1978 exemption which allowed protected material to be used freely for research purposes. Crucially, it also removes farmers' rights to re-use and exchange seed harvested from protected varieties unless individual governments specifically reinstate such rights. This clause effectively extends the rights of plant breeders to all harvests derived from the protected seeds. Some observers have suggested that the 1991 Act is part of a regulatory progression which will take UPOV towards a system virtually indistinguishable from a comprehensive system of patenting.

To come into line with the 1991 UPOV Act, the European Community embarked on the introduction of a European plant breeders' rights system. In July 1994, it introduced Regulation 2100/94 which came into effect in September 1994. It established a framework for EC-wide plant variety protection and established a European Plant Variety Rights Office. In line with UPOV 1991, it extended plant breeders' rights to harvested material, reduced farmers' rights, and extended protection to a wider group of plant species and varieties.

The most contentious element of the regulation was the removal of farmers' rights to save seed from protected varieties from one year to the next. Farmers used to be considered to have a "right" or a "privilege" to save seed, even from a variety covered by plant breeders' rights, as long as the seed was for their own needs. Now they are only permitted to save seed on condition that they safeguard the "legitimate interests" of the plant breeder, which in practice means paying royalties on farm-saved seed. The regulation left rights' holders to negotiate

with farmers the size of these royalties (which may therefore vary from country to country). It also left responsibility for enforcing rights up to the rights' holders.

In November 1994, Britain issued a consultation document on proposals to bring the 1964 Plant Varieties and Seeds Act in line with UPOV 1991 and the EC Regulation on Plant Variety Rights.

All this legislation — the 1991 UPOV Act, the EU Plant Breeders Rights' Regulation, and the TRIPs part of the GATT agreement — seriously erodes the rights of farmers, whilst simultaneously strengthening the rights of plant breeders. Some members of the Crucible Group, a group concerned with intellectual property protection issues, have stated that:

"In the 1970s, the seed industry acknowledged the farmers' right to save and sell company-bred seed. In the 1980s, the farmers' 'right' became a 'privilege' as companies failed to hybridize cereals. Corporations complained that, because seeds are biological 'photo-copiers', farmers could hijack the resale market for their varieties. Today, the revised UPOV convention argues that it should be illegal for farmers to save seed of protected varieties at all. [The current GATT agreement] requires (in certain circumstances) that the burden of proof should be laid, not on the accusing company, but on the accused farmer . . . The prospect is for a new age of oppression in which farmers become renters of germplasm contracting to the subsidiaries of international companies for seed and chemicals and returning their harvest to the trade and processing subsidiaries of the same multinational."

which they, by and large, accepted, as they did payment of royalties, and the collation and publishing of an official list each year which specified, by variety, the acreages being grown of each grade of potato by each farmer.

Enforcing Plant Breeders' Rights

In the early 1990s, however, the holders of rights over potato varieties began to enforce their rights over the growing and selling of reproductive material. Acting on behalf of the rights' holders, the British Society of Plant Breeders began to issue notices to potato sub-licensees, informing them that "special arrangements will now apply in respect of the varieties listed. Production at any grade is only by arrangement with the

appointed Agent for the varieties, who must be approached prior to planting".¹⁶

As the buying and selling of the reproductive material of controlled varieties tightened, seed potato farmers became unable to grow most of the popular protected varieties unless they took out a contract with the rights' holders. Such contracts, which many farmers did agree to, specified the price at which the contracting company would take back the crop and barred growers from selling the crop to anyone else.

Companies controlling the contracts gradually began to reduce the acreage in Scotland allocated to seed potatoes, to tighten crop specifications and to reduce the prices they paid the growers. Farmers argued that four or five companies "acting as a cartel" were fixing prices and manipulating the market, thereby threatening the growers' profitability. In 1994, for instance,

seed potatoes bought under contract from Scottish growers for £140 per tonne were being sold for over double the price to English ware growers.¹⁷ The two groups of farmers were prevented from dealing directly with each other.

Angered and alarmed by these new restrictions and the threat to their livelihoods, many Scottish seed potato growers signed a petition expressing grave dissatisfaction at the breeders' (and their agents') stranglehold on their industry.¹⁸ The majority were afraid to be identified publicly, but attempts were made to get the issue raised in the farming and local press.

Some growers took up the issue with their Members of Parliament, trying to establish whether the rights' holders were acting beyond their legal rights. MPs who raised the matter with the Scottish Office were told:

"The Plant Varieties and Seed Act 1964 gives the holder of plant breeders' rights the exclusive right to authorize others to sell the reproductive material of the plant variety and to produce the reproductive material of a plant variety in Great Britain for the purpose of selling it. It is the normal practice of suppliers of seed potatoes to try to control the use of their varieties in order to ensure that quality is maintained and that they obtain a reasonable return on sales. Where varieties are protected under the system of plant variety rights, these rights provide the holder with the legal means to licence others to grow their varieties and to set the terms of the licences, including the payment of a royalty."¹⁹

The Scottish Office clearly believed that the rights' holders were acting within the law and that no further action would be taken. As to the issue of a cartel, MPs were told that :

"Under Schedule 7 Part II of the Fair Trading Act 1973, the supply of potatoes (other than by retail sale or to a person purchasing potatoes for the purpose of retail sale) is exempt from the Director General's monopoly reference making powers. This exemption extends to the supply of seed potatoes."²⁰

Frustrated by their attempts to challenge the rights' holders through the legal system and by limited support from farming unions, many Scottish seed potato growers began to explore practical ways around the problem.

Growing Small Ware

Some farmers opted out of producing seed potatoes and turned instead to growing ware — but to the same standards as they had been growing seed potatoes. The differences between seed potatoes and ware are largely technical: seed potatoes tend to be harvested earlier, are smaller and are inspected and certified for purity; ware, as non-reproductive material, are not subject to the



Picking potatoes at Angus in Aberdeenshire. Because potato buyers such as supermarkets and food processors demand consistency and continuity of supply, potato varieties have become closely matched to their end users and just a few varieties dominate. Of the 150 varieties of potato available in Britain, 10 varieties account for more than 70 per cent of acreage. Over 50 per cent of potato acreage is planted with controlled varieties.

Scotland in Focus/G Dey

same regulations concerning inspection, certification or plant breeders' rights.

A trade thus developed in "small ware", grown by former seed-potato growers and sold over the border directly to English ware growers. Although the small-ware trade had been in operation since the mid-1980s, it began to expand significantly in the 1990s; by 1994, some estimates suggested that 50,000 tonnes of small ware were heading South over the border each year.²¹ As ware are not certified, a relationship based on trust had to be established between the growers and buyers; the financial benefits to both parties from dealing directly with each other were considerable.

Rights' holders, however, claimed that they were losing as much as £4 million a year, including £200,000 in royalties payable on seed potatoes but not on ware.²² They claimed that this loss of revenue threatened their ability to continue research and development of new potato varieties.

Scottish seed potato growers argued in response that the rights' holders were ruining the Scottish seed potato industry by driving down returns to growers and overpricing Scottish seed potatoes in the English market to such an extent that English ware growers were turning to Irish and Dutch sources instead. They argued that there was a difference between paying a royalty to plant breeders to grow protected crops (which they were prepared to do) and the rights' holders acting as a cartel to manipulate the price of varieties and size of the market, preventing growers from exercising any form of control over their businesses.

It soon became a matter of some dispute whether the small ware trade was illegal or not, MAFF and plant breeders arguing that it contravened UK regulations. The issue came to a head in February 1995 when the British Society for Plant Breeders took a small ware grower from Aberdeenshire to court. The action was finally settled out of court with the grower agreeing to pay tens of thousands of pounds for lost royalties and the rights'

holders costs and promising not to grow Estima (the protected potato crop in question) in the future.²³

Innocuous Legislation

Seed potato production is, in many ways, an untypical sub-section of the farming industry. However, there are growing fears that what has happened in the seed potato industry may well happen to other farmers as well.

In Britain, arable farmers have now been notified by the British Society of Plant Breeders of their obligations to pay royalties on farm-saved seeds.²⁴ After protracted negotiations between rights' holders and farm organizations, levels of royalties have been fixed for various crops. The National Farmers' Union (NFU) argued for a rate of some 30 per cent, while some plant breeders demanded 80 per cent.

Plant breeders maintain that their industry "needs the new [regulatory] system to regain viability".²⁵ They argue that income from seed royalties has declined markedly over the last few years because of acreage reductions and increased use of farm-saved seed, a loss of income which has led to plant breeders cutting back on breeding programmes. This, the breeders argue, is not in the long-term interest of farmers.

As the Scottish seed potato growers' case illustrates, however, curbing or challenging corporate power is exceptionally difficult once a legal right to carry out certain activities has been established. Seemingly innocuous legislation can lead to fundamental changes in rights, ownership and control.

This article is edited from a longer discussion paper by the author on seed legislation, available from *The Ecologist's* editorial office, price £5. Also available is an earlier paper, *Seeds, Crops and Vulnerability: A Re-Examining of Diversity in British Agriculture*, price £10.

Notes and References

1. Article 27 of the Trade Related Intellectual Property Rights (TRIPs) section of GATT. A "sui generis system" refers to any intellectual property system which grants property rights but has been designed to fit a country's particular context and needs (in contrast to a universal patent system). There is much confusion and dispute, however, as to what actually constitute *sui generis* rights. The 1999 revision of TRIPs may well reject the idea of *sui generis* protection and demand that all GATT (now WTO) signatories comply with a universal patent system.
2. Although Third World countries are not being forced to adopt new legislation immediately, such legislation will have to be in place within the next few years.
3. Sutherland, P., "Seeds of Doubt: Assurance on 'Farmers' Privilege", *Times of India*, 15 March 1994.
4. van Wijk, J., "Farm seed saving in Europe under pressure", *Biotechnology and Development Monitor*, 17, December 1993.
5. For some crops such as wheat, large, expensive and sophisticated breeding programmes took over from farmers and gardeners over a hundred years ago in Britain and parts of northern Europe, while for others, particularly fruit and vegetables, smaller, often family firms, continued to be involved in the developing and marketing of new varieties for another 50 years or more.
6. *Report of the Committee on Transactions in Seeds*, HMSO, London, 1957.
7. For the purposes of the Act, analytical purity referred to the presence or absence of weed seeds, inert matter and seeds of other crop plants, and was expressed as a percentage by weight of the pure seed in a sample of prescribed size examined under laboratory test conditions. Germination rate was also expressed as a percentage and represented the number of pure seeds in the sample which produced a normal seedling under laboratory test conditions.
8. *Report of the Committee on Transactions in Seeds*, op. cit. 6.
9. *Plant Varieties and Seeds Act 1964*, Chapter 14, HMSO, London, 1974, Reprint.
10. *Ibid.*
11. The Act stipulates that selling includes "any transaction effected in the course of business a) under which the property in the reproductive material passes from one person to another, or b) under which the reproductive material is made over by one person to another in pursuance of a contract under which he will use the reproductive material for growing further reproductive material or other crops."
12. *Plant Varieties and Seeds Act 1964*, op. cit. 9
13. Fowler, C. and Mooney, P., *Shattering: Food Politics and the Loss of Genetic Diversity*, The University of Arizona Press, Tucson, 1990.
14. Potatoes do set seed, a method of propagation which is more fruitful than multiplication which yields a ten-fold increase only with each successive planting. But multiplication ensures that potatoes "breed true", each generation being a virtual copy of the preceding one.
15. Protected varieties include Estima, Cara, Romano, Wilja, Pentland Squire and Maris Bard. Those varieties not the subject of Plant Breeders Rights can be bought, grown and sold freely and include Record, Maris Piper, Desiree and Pentland Dell.
16. Circular to all potato sub-licensees from the British Society of Plant Breeders Ltd, 27 August 1993.
17. Author's discussion with Scottish seed potato growers, 14-15 June 1994.
18. Petition organized by seed potato growers based in Aberdeenshire.
19. Letter from the Minister for Agriculture and the Environment at the Scottish Office, Sir Hector Munro, to Malcolm Bruce MP, 6 August 1993.
20. Letter from Deputy Director of General's Office, Office of Fair Trading to Robert MacLennan MP, 30 July 1993.
21. Fowler, L., "Cartel blights potato trade, claim growers", article from unidentified Scottish paper, 1995.
22. *Ibid.*
23. Anon, "Firm fined for selling small ware as seed", *Farming News*, 31 March 1995. Within the next 10 years, the 30-year period of rights over many varieties of seed potatoes — Wilja, Estima, Maris Bard and Pentland Squire — will expire and then be freely available to seed potato growers to buy and sell. Many Scottish seed potato growers, however, maintain that they cannot sustain their businesses until then.
24. Varieties already in use will not be subject to royalties until seven years after the implementation of the new EU Regulation. But in order to claim the seven-year exemption, farmers will have to keep records to prove that they had purchased the variety and had planted it before September 1994. New varieties will be subject to royalties immediately.
25. David Taylor, chair of the British Society of Plant Breeders, quoted in *Farming News*, 14 April 1995.

Frank Cass

Environmental Politics

Editors

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Environmental Politics is concerned with three particular aspects of the study of environmental politics, with a focus on industrialised countries. First, it examines the evolution of environmental movements and parties. Second, it provides an analysis of the making and implementation of public policy in the area of the environment at international, national and local levels. Third, it carries comment on ideas from both a 'deep' and a 'shallow' perspective, generated by the various environmental movements and organisations, and by individual theorists. It is sensitive to the distinction between goals of conservation and of a radical reordering of political and social preferences, and aims to explore the interface between these goals, rather than to favour any one position in contemporary debates. Each issue contains a number of full-length articles; a profile section; and a bibliographical section. The profile section in each number focuses on current issues, providing a first perspective and analysis. It is of particular value for teaching, or simply for keeping abreast of important developments in the politics of the environment.

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ISSN 0964-0416 Volume 5 1996

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An Historically Peculiar Obsession

ENCOUNTERING DEVELOPMENT: The Making and Unmaking of the Third World, by Arturo Escobar, Princeton University Press, Princeton, New Jersey, 1995, \$15.95/£13.95 (pb), 290pp. ISBN 0-691-00102-2

Why is it virtually impossible to speak of the Third World without discussing the question of its development? Anthropologist Arturo Escobar, like many critics of the economic models that govern international development apparatus, seeks an alternative way of thinking about the situation of the Third World.

Escobar argues that a viable challenge to the development model requires a critical distance from its most basic unspoken assumptions. Development approaches will not be radically altered through discussions about how to improve particular development projects. We need to look past the question of which technical solution to apply in order to consider, instead, how "the problems" of underdevelopment have been defined in the first place.

Encountering Development is born of a now widely-shared recognition that the promises made in the name of development have not been fulfilled. Conditions for most people in the world have worsened despite the decades devoted to the modernization of economies and the alleviation of poverty through development. The frustrated professionals who work in development institutions admit that few of the projects into which so much time and effort has been poured show the results their planning promised.

Nonetheless, a zealous message reaffirming the need to improve, alter,

modernize, uplift and transform the lives of people in the Third World persists as if it were a moral imperative that cannot be questioned. What, then, does it mean to argue "against development?" Is doing so to show a callous disregard for the harsh conditions under which many people in the world live? Is criticism of development born of a nostalgic Western desire to keep certain societies as museum pieces and to deny the right to positive social change to the Third World?

Escobar's book is an ambitious effort to stake out a new kind of critical position that escapes this polarization between the "doers" (who claim that they must get their hands dirty in order to solve the world's problems) and the "preservationists" (who warn of the dangers of change to traditional cultures). Like preservationists, Escobar argues for an appreciation of the integrity and value of the ways of life so relentlessly targeted for change in the name of improvement.

But he does so in order to propose that the struggle over culture is an integral part of the struggle over economic exploitation and political domination. This is because development, Escobar argues, is not only an aspect of capitalist expansion; it is also a way of depicting the world and telling stories about what can, should and must happen in it.

Development, he maintains, is neither an abstract moral ideal nor an economic imperative. It is, rather, an historically peculiar obsession of the twentieth century which needs to be understood less as truth and more as the result of a convergence of culturally specific preoccupations.

It is, moreover, a discourse: "a domain of thought and action" that forms an "efficient apparatus that systematically relates forms of knowledge and techniques of power". We need to understand that development activities are based on a conceptual map "used to locate and chart Third World people's experience" because these concepts are also "the categories with which people have to struggle". Even though most development projects fail, the activities launched in the name of development nonetheless succeed in:

"creating a type of underdevelopment that has been . . . politically and technically manageable".

Escobar follows philosopher-historian Michel Foucault in arguing that power operates not only through brute acts of repression but also by opening up more and more aspects of our lives to

apparently benign techniques for their investigation. Description of people's problems opens the way for surveillance and management.

The representation of the world through language, according to this view, is not a simple, passive act through which thoughts are expressed and the world is depicted. Instead, a given discourse is a system of categories and relations that actually create a certain kind of "reality" by making possible some ways of recognizing, knowing and describing things while ruling out others. And ways of naming problems lead to ways of acting upon them.

Consider the terms in which Third World development is discussed. The Third World is seen increasingly through a "grid of observation" in which certain "problems" can be scrutinized, separated and, more insidiously, managed and monitored by "experts" through what appear to be the innocent practices of research, analysis and planning. The representations contained in planning documents and research reports converge with bureaucratic practices to expand a hegemonic order in which it becomes increasingly difficult to think about alternatives outside the assumption of the necessity of economic growth and planning.

Escobar's use of post-structuralist theory to analyse development entails a discussion of the limitations of the more conventional political-economic criticisms of development. While insisting on the need to perceive the systemic structural mechanisms that reproduce social inequality, Escobar makes the case that to impute only economic functions to development agendas is to simplify greatly what development actually does.

Criticisms of development solely from a political-economic perspective fall short because they seek to reveal only the economic interests masked by development rhetoric. By seeing discourses solely as cover-ups for what is "really" going on, he says, these critiques fail to appreciate the way words and conceptual models actually work, materially, to shape the world in their own image.

Few Marxists are accustomed to regarding capital as a kind of story or as a system of meaning, but that is what Escobar insists that it is. We see:

"the discursive nature of capital in the resignification of nature as resources; in the construction of poverty as lack of development, of peasants as merely food producers, and

of hunger as lack of food requiring rural development; and in the representation of capital and technology as agents of transformation”.

The language of development planning marks the first step toward establishing a certain set of relations of domination through development implementation.

Economic inequality, Escobar insists, works in tandem with imbalances in who controls the very depiction of a cultural reality. Which story about peasant ways of life and their relation to market economies will be told, the local people's or the World Bank's? Escobar suggests that economic struggles are also cultural ones. He insists, therefore, that local experiences of development should not be translated into explanations that take a universalizing model of economic “facts” as a common denominator.

Thus two themes run through *Encountering Development*. One analyses the unfolding of established thinking about development; the other suggests how such thinking might be undone. It is common, of course, to aim criticisms of development at the big players (the International Monetary Fund, the World Bank, the United Nations agencies), while holding out the hope that more flexible non-governmental organizations will offer the necessary alternatives.

But Escobar's analysis of development as a discourse suggests that development thinking is not fundamentally transformed by such alternative proposals. They simply extend what is included as a problem amenable to development management without disrupting the expansion of these management techniques. In a chapter examining three attempts to reform past development mistakes — integrated rural development programs for small farmers; women in development initiatives; and ecologically-minded calls for sustainable development — Escobar cautions that such attempts are more likely to *strengthen* the overall machinery of development than to undermine it. The problem with the development vision is not what it has left out, but what it accomplishes whenever it includes something as a “problem” for which it is the solution.

What, then, can be done? A politics of cultural affirmation needs to be advanced in the face of the depoliticizing, bureaucratizing effects of development intervention. Such struggles need to take into account how development subtly reorders and renames the world as it goes

about the more obvious business of implementing specific projects. A defence of local ways of seeing situations needs to be tied to struggles against political-economic systems of exploitation because:

“capitalist regimes undermine the reproduction of socially valued forms of identity; by destroying existing cultural practices, development projects destroy elements necessary for cultural affirmation.”

Escobar finds hope in grassroots social movements, while cautioning against the desire to seize on a single answer that can be applied to all places and situations.

Any critique of the cultural imperialism fostered by development raises another set of questions about Western representations of the Third World. How can we criticize development without drawing on Western romantic stereotypes about the intrinsic goodness of some vaguely imagined traditional Third World?

Escobar suggests that there are lessons to be learned from the diverse ways people at the local level work out means for living with, through and against the larger systems that organize many of the conditions of their lives. These local practices are not (as is often assumed) somehow more authentic or true because they are untainted by Western ways of thinking.

Rather, they are the hybrid products of struggles for self-definition through engagement with the forces of modernization and capital expansion. We can look to local situations for insight into strategic practices of resistance within structures of domination. Escobar proposes a way of thinking about cultural difference that sees it as “an effect of forms of connectedness” rather than as that which has not yet been soiled by capitalism and Westernization.

A politically viable critique of development, therefore, only begins with the recognition that the story about economics told by development planners is but one version of reality among many. It must be grounded in an understanding of the processes that draw local cultural and economic resources into larger systems. At the same time, we must look for viable alternatives in the actual everyday local strategies people around the world use to preserve local autonomy.

Encountering Development contains neither a clearly stated pragmatic strategy nor a nuanced analysis of the local, hybrid social forms Escobar urges us to learn from. Rather, the book sketches how current academic theories about

language and political power, on the one hand, and about modernity and cultural difference, on the other, can show precisely why and how the idea of development has become one of the most important forces of our times.

His analysis goes well beyond familiar anti-development rhetoric by suggesting precisely how all the activity in the name of development has reshaped our world. It shows that few of us are fully aware of how much our very sense of the realities of Third World problems perpetuate a process of capitalist expansion. It is an unsettling challenge to conventional debates about development.

Stacy Leigh Pigg

Stacy Leigh Pigg is assistant professor of anthropology at Simon Fraser University in British Columbia, Canada.

Consuming Passions

THE UNMANAGEABLE CONSUMER: Contemporary Consumption and its Fragmentation, by Yiannis Gabriel and Tim Lang, Sage Publications, London, 1996, £12.95 (pb) 213pp. ISBN 0-8039-7745-X.

A few weekends ago, I went to buy a jacket at a second-hand clothes market. As my new job involves more contact with the world of men in suits than my old one, I wanted something that was not dated, that would blend me in, but that wasn't too straight. It had to be in a good enough condition to give me the desired respectable image, but I also had to like how it looked on me. Despite these conditions, I just couldn't bring myself to buy a new version of an item that would be worn relatively infrequently.

Hardly surprisingly, I didn't get a jacket. But even so, I was still acting in several roles as a consumer, according to Yiannis Gabriel and Tim Lang — as an “explorer” of the market, as someone seeking to communicate a meaning to the world and applying some sense of aesthetics, as an “activist”, and as a “citizen” taking environmental responsibility. My preference for second-hand was also making some sort of statement about my identity (even if only to myself). And, of course, throughout the process, I was applying consumer choice — even up to the point of not buying anything.

The Unmanageable Consumer is a tour of the many perspectives from which consumerism has been studied, combining political, psychological and sociological ways of thinking and insights. After a brief history of the rise of contemporary consumerism, each chapter looks at the consumer from a different angle — as chooser, communicator, explorer, identity-seeker, hedonist/artist, victim, rebel, activist and citizen.

Along the way, a huge variety of topics are covered: from the effectiveness of consumer boycotts, through the various ways objects hold symbolic meaning, to psychoanalytic theories of identity-seeking; from the history of consumer activism as a way of getting a fair deal, through a discussion of the roles of and techniques used in advertising, to a description of the effect of television on traditional ways of life in Tibet. The authors' opinions appear briefly and occasionally; most of the text is a dispassionate, excellent and well-referenced introduction to the available literature.

Two themes emerge, however. The first is the proposition contained in the book's sub-title that Western consumption "as we know it" is in its twilight phase. Consumerism was built on the "Fordist Deal" whereby workers in mass production processes were paid relatively high wages so that they could buy the products they made. The opening up of the global economy, with the result that production can go to wherever wages are cheapest, and the automization of production are among the factors which Gabriel and Lang argue are changing the security and expectations of Western consumers forever:

"Whilst we cannot see the end of Western consumerism yet, its future can no longer be taken for granted."

A second theme is the global aspect of consumerism today (all too often neglected by cultural and sometimes environmental studies). As Gabriel and Lang say:

"Inequalities between consumers are already sharp, leaving substantial numbers of them window-shopping with only restricted opportunities to make a purchase and many, in the Third World, without even windows to window-shop . . . The debate is no longer about absolute levels of population or about the exhaustion of particular types of raw materials, but about the continued impact on the ecosystem of reckless consumption in the First World

and desperate attempts to escape poverty and hunger in the Third."

As an environmentalist, I would have found the book more useful if, rather than simply outlining the many meanings that consuming can have, it had put forward a more critical view of these meanings. For example, rather than just exploring the psychological evidence for the ways that consumption can confer identity, it could also have suggested ways in which identity can be independent of consumption.

My prime focus, however, is against "reckless consumption in the First World", and whilst the book provides some useful material for this campaign, its role is not solely to do so — even though it does cover the many aspects of consumer activism.

If the central argument of *The Unmanageable Consumer* is correct — that consumerism has different meanings at different times and places for different individuals which cannot be predicted but are currently in a fundamental state of change — then the basis of current consumer campaigns looks set to change pretty drastically as well.

Anna Thomas

Anna Thomas is an environmental campaigner who has worked at *Ethical Consumer Magazine* and in the Enough! Anti-Consumerism Campaign.

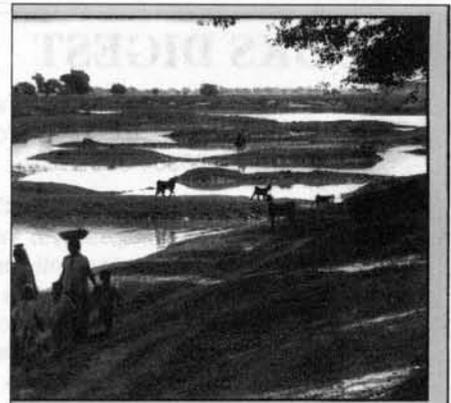
Omnivores in India

ECOLOGY AND EQUITY: The Use and Abuse of Nature, by Madhav Gadgil and Ramachandra Guha, Routledge, London, 1995, £12.99/\$19.95 (pb) ISBN 0-415-12524-3 (pb)

Analysing the ecological history of a society as complex and diverse as India is a daunting task. Full marks go to the authors for this work which provides a succinct but information-loaded summary of the contemporary history of India *vis à vis* its people and natural resources in the context of a modernizing world.

Central to the organization of *Ecology and Equity* is the authors' decision to classify Indian society into three categories: ecosystem people; omnivores; and ecological refugees — a classification which could be used on a global level as well to describe the international politics of resource use.

Ecosystem people constitute more than half India's population. They are those



Ecology and Equity

the use and abuse
of nature in
contemporary India

MADHAV GADGIL and
RAMACHANDRA GUHA

R

who depend on their immediate environments for their vital material needs such as food, fodder, fuel and shelter.

Omnivores are the vocal minority who are the "real beneficiaries of economic development". They are the "movers and shakers" who have access to virtually any resource, natural or man-made, they want through an exhaustive and highly-subsidized industrial and market economy.

Ecological refugees are what's left of ecosystem people after omnivores have done their rounds in a locality.

These three categories lend themselves well to explaining the Indian history of the last three centuries, a period when the wants of an elite few — first, the British colonial powers, then the technocrat-bureaucrat-politician-urbanite combination of independent India — have superseded the needs of ecosystem people. Common resources such as water, land and air have been used freely or, at best, with the cushion of state-sponsored subsidies, by omnivore institutions to create "a democracy of the omnivores, for the omnivores, by the omnivores."

Refreshingly, Madhav Gadgil and Ramachandra Guha have broken down the clichés surrounding the concept of elite minority versus toiling masses with little publicized but very relevant case studies from their own experience. Instances of a voluntary agency trying to stop brick and tile factories from buying the topsoil of paddy fields are cited along with lessons from more well-known popular struggles such as the anti-dam struggle in the Narmada valley and movements like Chipko.

Vote-hungry politicians could well have

BOOKS DIGEST

- **BEYOND BLACK AND WHITE: Transforming African-American Politics**, by Manning Marable, Verso, London and New York, 1995, £13/\$17 (pb) 236pp. ISBN 1-85984-049-3.

"Race is essentially a social construction," says Manning Marable in his preface to this collection of essays, "not a permanent fact of biology or genetics" and as such, is constantly being redefined. Dissecting the politics of race and class in the US during the 1990s, Marable argues that the black struggle has to move beyond previous strategies such as separatism or integration to an approach which embraces unique cultural identities while also restructuring power and privilege in US society.

- **WILD IDEAS**, edited by David Rothenberg, University of Minnesota Press, Minneapolis and London, 1995, \$19.95 (pb) (UK distributor UCL Press, £13.95) 225pp. ISBN 0-8166-2615-4.

The editor's aim in gathering these articles is to "challenge our notions of wilderness which have been so central to the development of conservation and environmentalism" in the United States and, through US organizations, the world. Among the topics discussed are the confluence of wilderness, empire and race, gendered views of wilderness, urban wilderness, and the ways the ecology movement uses language.

- **DISARMING PATRIARCHY: Feminism and Political Action at Greenham**, by Sasha Roseneil, Open University Press, Buckingham and Philadelphia, 1995, £12.99/\$24.95 (pb), 225pp. ISBN 0-335-19057-X.

Greenham Common has come to represent not only the US Air Force base in Newbury, Berkshire where nuclear cruise missiles were stationed between 1983 and 1991, but also an instance, place and style of feminist political action for social change. The author examines the ways in which both militarism and patriarchal gender relations were challenged by this action.

- **CITIZEN SCIENCE: A Study of People, Expertise and Sustainable Development**, by Alan Irwin, Routledge, London and New York, 1995, £13.99/\$16.95 (pb), 198pp. ISBN 0-415-13010-7.

"Scientists do not automatically command public trust" said the House of Commons Agriculture Select Committee in 1990, concluding that expert statements alone were unlikely to reassure the public. The scientists in question had recently stated that BSE was probably not transmitted from cattle to humans, yet a sceptical public was described as "hysterical" and "confused". This and other examples are used to explore the relationships between the general public, scientists, experts and policymakers in facing environmental threats.

- **THE AFRICAN INHERITANCE** by Ieuan Ll. Griffiths, Routledge, London and New York, 1995, £12.99/\$17.95 (pb), 216pp. ISBN 0-415-01092-6.

Stories of civil wars, refugee movements and famine dominate news about Africa. This succinct volume traces the causes of many of these events to the time when European powers divided the continent into separate colonies which later became sovereign states. The author argues that this "colonially-imposed straitjacket" of political geography also affects attempts to tackle the consequences of colonial rule.

- **THE SEED SAVERS' HANDBOOK**, by Jeremy Cherfas and Michel and Jude Fanton, Grover Books, (Worldly Goods, 10-12 Picton St, Montpellier, Bristol BS6 5QA, UK) 1996, £12.95 (pb), 168pp. ISBN 1-899233-01-6.

This book combines a summary of current issues surrounding seeds — declining diversity, restrictive legislation and food security — with practical details of how to grow some 80 vegetables from home-saved seeds.

Any book reviewed in *The Ecologist* can be ordered from WEC Book Service, c/o The Wadebridge Bookshop, 43 Molesworth St., Wadebridge, Cornwall PL27 7DR, UK. Fax: 01208 815705. For p&p, please add 15% (20% outside UK) of total cost to order.

used the first section of the book entitled "The India that is" to work out critical election issues. The second section, "The India that might be", outlines the authors' ideas for tackling these issues.

Gadgil and Guha rightly recognize that many environmental protests in India are too localized and issue-specific to offer a long-term sustainable solution to the problems they are challenging. However, a National Alliance of People's Movements, mentioned by the authors, is slowly evolving to address just this shortcoming. Perhaps, however, both the alliance and the authors may discover that no development model can ever really succeed, given the inherent inability of people to sacrifice their self interest.

Two cases in *Ecology and Equity* aptly demonstrate this. The first instance describes a conflict over groundwater between a richer, upper-caste horticultural community and poorer, lower-caste paddy cultivators in coastal India. In the second case, these same exploited cultivators became exploiters when they came into direct conflict over water with even lower-caste and poorer estuarine fisher-folk. Ecosystem people are not necessarily angels; given the opportunity, they too might not hesitate to hijack a larger development agenda to serve their own interests.

In proposing their alternatives, Gadgil and Guha dismiss the practicality of applying Gandhian or Marxist models of development as a whole. They maintain that the Marxist model is too centralized and disallows public participation, while the Gandhian emphasis on voluntary moral restraint on consumption by omnivores and ecosystem people is, in practice, a pipe-dream.

Their "working synthesis" brings together several positive elements from three contending schools of development — Gandhism, Marxism and Liberal Capitalism:

"Decentralization and empowerment of village communities along with moderation of appetite for resource consumption from Gandhism; equity and empowerment of the weaker sections from Marxism; and an encouragement of private enterprise coupled to public accountability in an open, democratic system from liberal capitalism."

The challenge, however, is to establish a structure where control (to ensure moderation) does not degrade to exploitation,

where regulation (to ensure equity) does not result in corruption, and where public accountability does not create room for deceit and meaningless statistics-mongering.

The authors indulge in some wishful thinking when they propose that:

“private enterprise [should be] encouraged in delivering services such as education, health care or watershed-based soil conservation for which communities pay through public funds.”

Experience tells us that private enterprise will not step in without a profit motive. Privatizing health care, for instance, can only be possible in an inequitable society, where the rich pay large sums for treatment, and the private facilities dip into their profits to provide some free health care to the poor.

In fairness to Gadgil and Guha, however, their proposed alternatives are invaluable in that they raise various issues which need to be debated more. More importantly, they discuss these issues in a language that is understandable to the layperson and, interestingly enough, will draw in even the odd bureaucrat.

Nityanand Jayaraman

Nityanand Jayaraman is a Bombay-based freelance journalist covering environment, development and coastal issues.

When East Meets West

HOW WE SURVIVED COMMUNISM AND EVEN LAUGHED, by Slavenka Drakulic, Vintage, London, 1993, £5.99 (pb) 193pp. ISBN 0-09-926571-0

CINDERELLA GOES TO MARKET: Citizenship, Gender and Women's Movements in East Central Europe, by Barbara Einhorn, Verso, London and New York, 1993, £11.95/\$17.95 (pb) 280pp, ISBN 0-86091-615-4

GENDER POLITICS AND POST-COMMUNISM: Reflections from Eastern Europe and the Former Soviet Union, edited by Nanette Funk and Magda Mueller, Routledge, New York and London, 1993, £11.99/\$18.95 (pb) 349pp. ISBN 0-415-90478-1

Within the last few years, Eastern European countries have undergone tremendous changes. But while the revolutions in 1989-1990 attracted much international attention, comprehensive analysis of more recent developments is rare.

Westerners tend to know little or nothing about everyday lives and politics in the East. The differences among the various countries of Eastern Europe in their progress towards democracy, as well as the continuing changes and the plethora of “new” political parties and politicians, are dauntingly confusing to outsiders.

Many East Europeans have noticed the drop in interest in their situation among outsiders whose focus now seems to rest solely on the market interests of Western companies and the difficulties East European countries face in adapting to a capitalist market system

During the last few years, however, women's groups from West and East have been trying to get to know and support each other, confronting in the process a multitude of prejudices and stereotypes on both sides. Each of these books is a useful contribution in overcoming these and moving towards mutual understanding and the expression of differences.

The essays of Croatian journalist Slavenka Drakulic in *How We Survived Communism and Even Laughed* challenge the reader to consider the activities of day-to-day life in different Eastern European countries which, despite dramatic changes, still go on. Food still has to be obtained and cooked, laundry still has to be washed, clothes still have to be mended — chores which are still primarily carried out by women.

Drakulic tries to explain the political potential of the “trivial”: the constant effort of doing the daily shopping and finding alternatives to unavailable sanitary towels and toilet paper were just some of frustrations that made people struggle for the collapse of the Communist systems.

She remembers her grandmother using a big metal washing tub and a wooden washboard to perform her Saturday laundry washing ritual, a tradition continued by Drakulic's mother despite the availability of a state-run laundry. In many East European countries, a washing machine was a luxury or a symbol of prestige. Says Drakulic:

“a woman needs to have a tub ready even today, because she doesn't know what is waiting for her — she has no way of knowing what



Barbara Einhorn

Cinderella GOES TO MARKET

Citizenship, Gender and Women's Movements in East-Central Europe

democracy will look like in an Eastern European country”.

West European women tend not to understand why many women in Eastern Europe often did not appreciate the communist ideal of socializing housework through public laundries, kindergartens, and work and school canteens. In East Germany, for instance, young families wanted to have their own washing machines because they did not trust such services, while many wives and mothers cooked for their families in the evenings because they did not believe that canteen food was sufficiently nutritious.

Because a large part of people's lives in the Communist systems was supposed to be taken up with public and political activities, family life was a means of retreating into privacy. The home was sometimes the only place where women felt they could talk freely and maintain some distance from official politics.

Thus, the Western feminist slogan “the personal is political” is not popular in Eastern Europe. Women's invisibility and absence from East European politics, however, has many causes. As British academic Barbara Einhorn points out in *Cinderella Goes To Market*, it is:

“scarcely surprising if, out of the apathy, resignation, or anonymity caused by ‘patriarchal-paternalist’ state socialism, a culture of autonomous, active and democratically inclined political subjects has not appeared overnight”.

Einhorn researched women's lives in East Germany, Poland, former Czechoslovakia and Hungary to highlight the:

"ambiguities in the situation of women both 'before' and 'after': namely, that despite clear improvements in the civil and political rights associated with democratic citizenship, in the short run at least, women in East Central Europe stand to lose economic, social welfare, and reproductive rights."

Einhorn outlines the position of women in Marxist theories, explores the connections between ideology, family and the nation, and investigates women's reproductive rights and women's participation in politics, economics, literature and the media.

As she points out, "the revolutions of 1989 left the patriarchal system of power intact", so that some things are not really changing for women in East Central Europe.

Gender Politics and Post-Communism, meanwhile, is the first collection published in Britain of original essays on gender politics by some 30 women activists, politicians and scholars from different East European countries and the former Soviet Union, combined with some "reflections from outside" written by the Western feminists who edited the collection.

The book covers diverse issues: feminist critical theory, single mothers, full employment, women in politics, abortion rights, women and war, and the development of gender studies.

Communication, however, is difficult; it seems that no dialogue is possible without misunderstandings, disagreements and mistakes. Not only do few Western women speak Polish, Hungarian or Romanian, for instance, but some words that can be translated among Western European languages — because the concepts they express exist in the various West European cultures — have a very different meaning when translated into the languages of East European countries. Concepts such as "left", "emancipation", "socialism" and "politics" are understood in quite different ways.

The various articles in *Gender Politics* indicate that the women's movement is growing in different ways and at varying speeds in East European countries. Whatever direction they take, whatever possibilities women explore to participate in politics, there will always be dirty laundry to be done.

Michaela Moser

Michaela Moser is a theologian, freelance writer and a co-organizer of the European Women's Synod 1996.



Letters

Fuel Taxes

This is a belated follow-up to Simon Fairlie's article on the theory of road tolls (*The Ecologist*, Nov/Dec 1994) and the letters from Charles Komanoff and Jonathan Tyler (*The Ecologist*, Sept/Oct 1995).

It seems to me that attempts to relate charges to some basis like congestion, which can purport to derive a theoretically "right" level of charge from elaborately-analysed congestion data, make the whole business of using economic tools to reduce the damage done to society by motor traffic much more complicated than it need be.

The "free market" environment for most economic activities is heavily rigged by a hotch-potch of taxes and subsidies, many of them with no theoretical justification at all. They are rooted in history and business lobbying; many of them are pulling in the wrong directions altogether.

Small examples, like the subsidy once paid for grubbing up hedges, can be corrected, but all major forms of transport are being subsidized at the expense of local economic activities meeting local needs. The need to get things moving in the right direction far outweighs any need to get the instruments tailored to any particular element in the damage caused by motor transport.

Tyler acknowledges that "higher taxation of petrol might help, but demand is inelastic at the sort of average levels that would be politically credible". But "political credibility" is surely a field where shapers of opinion could play a part. By and large, we have let "environmental taxes" establish themselves in the public mind (which is where what is "politically credible" gets determined) as additional taxes.

In any sort of presentation of the advantages of a change in the forms taxation takes, it make sense to lead with the tax to be abolished or abated. National

Insurance is an obvious candidate, because it is a tax on industry to offset against the additional burden on industry of raised fossil fuel tax.

It would be enormously cheaper to increase fuel taxes than to invent new taxes. Some of the saving could go to measures to soften any inequity, such as voucher schemes for low-tax fuel. This is the sort of field where expert study, to help make simple environmental taxes politically credible, is needed.

Roy Catran

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No Motoring Day

I would like to raise the following issue: we have a National Cycling Day and a National No-Smoking Day — why don't we have a National No-Motoring Day? (Or if we do, why haven't I heard about it?)

If the benefits of using motor cars less often are clear — as are the benefits of smoking less — it seems to me highly appropriate to have a day focussed on finding suitable alternatives. Even those of us whose livelihoods are tied up with road transport (though how inextricably?) should welcome a No-Motoring Day as less unnecessary car journeys will mean less traffic to struggle through.

Public transport companies could be particularly supportive, and may usefully take the opportunity to research routes and prices.

My first thought for a suitable date was one connected with the invention of the motor car, but it may be that the mass-production of motor cars or the building of motorways might provide more appropriate anniversaries!

Andrew Maliphant

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24 June 1996: **ARCADIA REVISITED: THE AESTHETICS OF LAND MANAGEMENT IN THE 21st CENTURY**, Royal Geographic Society, 1 Kensington Gore, London SW7 2AR, 10am-7 pm. For further information, contact Catherine Brighton, CB Events, 4 Dolphin Street, Deal, Kent, CT14 6LX. Tel/Fax: 01304 381026.

6 July 1996: Dayschool on **ARMS TRADE AND THE ECONOMY**, Leeds Civic Hall. Contact CAAT, 11 Goodwin Street, Finsbury Park, London N4 3HQ. Tel: 0171-281 0297.

13 July 1996: Reclaim the Streets **STREET PARTY** for street theatre groups, musicians, acrobats or just plain interested people. Contact Reclaim the Streets, PO Box 9656, London N4 4JY. Tel: 0171-281 4621.

14 July 1996: **WALK FOR WEST PAPUA**. Sponsored walks in Bedford, Brighton, Bristol, Dorset, Leeds and Oxford. Contact Survival Walkathon, 11-15 Emerald Street, London WC1N 3QL. Tel: 0171-242 1441.

26-28 July 1996: International conference **HUMAN HEALTH & TOXIC CHEMICALS**, University of Warwick, to discuss realistic solutions to chemical contamination of land, water and food. Contact: Green Network, 9 Clairmont Road, Lexden, Colchester, Essex CO3 5BE, UK. Tel: 01206 46902; Fax: 01206 766005.

4-6/7 September 1996: Interdisciplinary Symposium **RESPONSIBLE ENVIRONMENTAL BEHAVIOUR**, Berne. Contact IKAÖ, Universität Bern, Falkenplatz 16, CH-3012 Bern, SWITZERLAND. Tel: +41(31)631 3958; Fax: +41(31)631 8733; E-mail: info@ikaöe.unibe.ch.

26-28 September 1996: **NEW EUROPE: Transformation and Environmental Issues**, Bratislava. Contact Dr Martina Vagacova, Academia Istropolitana, Hanulova 5/b, 840 02 Bratislava 42, SLOVAK REPUBLIC. Tel: +39(49)875 6788; Fax: +39(49)875 6788; E-mail: enviro@acadistr.sk.

6-8 January 1997: **INTERNATIONAL CONFERENCE ON LAND MANAGEMENT**, Royal Institution of Chartered Surveyors, Parliament Square, London. Contact: Dr Richard K Bullard, School of Surveying, University of East London, Longbridge Road, Dagenham, Essex, RM8 2AS. Tel: 0181-590 7722; Fax: 0181-849 3618; E-mail: Bullard@UEL.AC.UK.

COURSES

CEMP Training Programme, Aberdeen, Scotland. July/August 1996 **Environmental Assessment and Management**. September 1996 **Impact of Major Events**. Contact Professor Brian D Clark, CEMP, AURIS Business Centre, 23 St Machar Drive, Aberdeen, AB2 1RY, SCOTLAND. Tel: 01224-272483; Fax: 01224-487658; E-mail: cemp@abdn.ac.uk.

International Training Programmes on Environmental Technology and Sustainable Land Use, Wageningen, The Netherlands, autumn 1996. Contact July Leesberg, IAC, Postbus 88, PO Box 88, 6700 AB Wageningen, THE NETHERLANDS. Tel: +31-317 490111; Fax: +31-317 4118552.

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WorldWatch, **STATE OF THE WORLD**. The annual report by Lester Brown and the WorldWatch Institute. Contains 10 separate studies on such issues as the Earth's carrying capacity, a plan to save the world's forests and the reshaping of the power industry. 360pp, paperback, 1996, £9.95.

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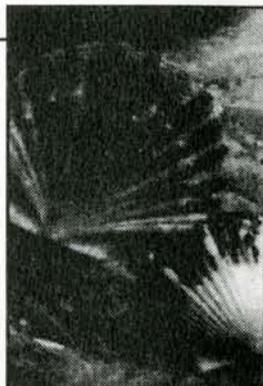
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