

Case studies of biodiversity markets for forest environmental services

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
Australia	Biodiversity credits	Proposal	Developers who destroy biodiversity and who are required to offset loss.	Landowners who establish a conservation easement in their lands.	Clearing-house.
Australia	Shares in Earth Sanctuaries Ltd.	Pilot - shares issued in May 2000	Demand for shares from the general public.	Shares are supplied by Earth Sanctuaries Ltd	Exchange based purchase.
Australia (Western Australia)	Access rights to Smokebush	Pilot in late 1980s	AMRAD, an Australian Pharmaceutical company, for potential medicinal uses.	Department of Conservation and Land Management	Direct payments.
Australia (Tasmania)	Tasmania Private Reserve Programme - conservation covenants & land acquisition	Emerging - initiated in 1997	The Government allocated A\$30 million in 1997 to create a reserve system.	Private landowners. Agreements have been made with 42 landowners covering 5,594 ha.	Over-the-counter transaction – standard covenant setting out restrictions on land use and land purchase
Austria	Lower Austria Landscape Fund - biodiversity management contracts	Mature - initiated in 1993	Government.	Farmers and foresters who agree to biodiversity-friendly activities.	Over-the-counter transaction - standard 20-year management contracts.
Belize	The Belize Protected Areas Conservation Trust – protected areas	Mature - established in 1995/6	Range of forest users from foreign tourists, tour companies, to those extracting permitted forest products. Total demand reaches approx. US\$500,000/year.	Local conservation NGOs, community groups and government agencies in conservation efforts.	Trust fund intermediary.
Belize	Rio Bravo Conservation and Management Area - land acquisition & private protected area	Pilot	Coca-Cola Foods Inc.; an individual investor, Barry Bowen; New River Enterprise; and, more recently, the "Adopt-an-Acre" programme in the USA and the UK	An NGO, Programme for Belize, protects biodiversity in the Orange Walk District - over 97,000 ha.	Pooled transaction & NGO intermediary.
Bhutan	Bhutan Trust Fund for Environmental Conservation - protected areas	Pilot - in 1991	GEF, the World Wildlife Fund and bilateral donors from the Netherlands, Norway and Switzerland. The fund was capitalised with US\$9.5 million and was expected to grow to US\$20 million.	Government of Bhutan through investments in a national system of protected areas.	Pooled transaction and trust fund intermediary.
Bolivia	Logging rights purchase	Pilots - 1998/9	The Nature Conservancy (1998) in Noel Kempff, and Conservation International (1999) in Madidi.	Logging rights sold by timber concessionaires next to the Madidi National Park (45,000 ha) and the Noel Kempff Mercado National Park (630,000 ha)	Direct negotiation.

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Bolivia	Debt for nature swap	Pilot - 1987	Conservation International purchased \$650,000 worth of debt for \$100,000 and exchanged with the Bolivian Government for \$250,000 in local currency for spending on biodiversity protection.	The government of Bolivia committed to three new protected areas adjacent to the Beni Biosphere Reserve, and to strengthen the Beni Reserve.	Direct negotiation.
Brazil	CONAMA - park mitigation requirement	Emerging - since 1987	Infrastructure investors who are required to offset biodiversity damage through investment in protected areas worth at least 0.5% of original infrastructure costs.	The environmental authority supplies approved offsets or purchased directly.	Direct negotiation or clearing-house.
Brazil (Amazon)	Reserve requirement offsets	Proposed	Demand of offsets would come from property owners who fall short of the legal reserve requirement.	Supply of offsets would come from landowners with surplus forest.	Direct negotiation or clearing-house market.
Brazil	National Environmental Fund – protected areas	Mature - established in 1989	The Government of Brazil with funds from general taxation, environmental fines and penalties and external sources, e.g. donor loans	Establishment of conservation units, research, environmental education, forestry extension.	Revolving Trust Fund intermediary.
Cameroon	Access rights for bioprospecting	Emerging	US National Cancer Institute was searching for a potential drug to treat HIV/Aids.	Cameroon is classified as a "mega-diversity" country with over 9,000 species of plants, of which 160 are endemic.	Project-based, pooled transaction and Trust Fund intermediary
Chile	Private protected areas	Emerging	Private individuals, universities, foundations, NGOs, companies, communities, etc..	In 2001, estimated 100 private protected areas.	Direct negotiation.
China	Pippa Horticulture Company Ltd – access rights	Pilot/nascent - established in 1994	Pippa Horticulture Company Ltd. dedicates 20% of company's profits to conservation.	<i>In situ</i> conservation undertaken by the Nanjing Botanical Garden Service Station with local communities.	Joint venture.
China	Shares in National Scenic Reserves/ Forest Parks	Emerging	Investors interested in potential income and biodiversity protection.	Between 1996-1999, four Forest Parks have been listed on the Shanghai stock market	Exchange-based trade.
China (Guizhou Province)	Protected wetland for endangered cranes	Mature - initiated in 1995	International Crane Foundation, Guizhou Province and the Trickle Up Programme	The Caihou Nature Reserve protects a valuable wetland ecosystem	Pooled transaction & revolving Village Development Funds.
Colombia	ECOFUNDO – protected areas	Unclear	Canada (CIDA), USA (USAID), international NGOs and the Colombian government paid \$18 million towards conservation activities.	Conservation activities are undertaken by NGOs.	Pooled transaction & Trust Fund intermediary.
Colombia	Conservation coffee	Emerging	Conservation International is paying start up costs and expects to generate continued payments from coffee retailers	Shade coffee growers in and around Colombia's Naya Conservation Corridor, which covers 1.037 million acres.	Retail-based sales - "Conservation Coffee" .
Costa Rica	INBio's bioprospecting	Emerging –	Academics, NGOs, individuals,	Costa Rica has approximately 5% of	Clearing-house – INBio.

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	permits	Since 1989	pharmaceutical companies, crop production and crop protection companies.	the world's biodiversity and approximately 25% of the country is under the National Systems of Conservation Areas.	
Costa Rica	Del Oro - payments for forest pest and disease control services through a land lease	Proposal - agreed in 1999, then abandoned	The private firm "Del Oro" owns an orange plantation adjacent to the Guanacaste Conservation Area. Wishing to produce organically, Del Oro sought to benefit from the Guanacaste forest's pest and disease control services.	The Guanacaste Conservation Area. Flies, wasps, birds and other species in the area interact to control damaging insects.	Bilateral negotiation & retail-based trade.
Costa Rica	Children's Rainforest, Monteverde – protected areas	Mature	General public through donations worth US\$6 million/year to "The Children's Rainforest"	Biodiversity protection in Monteverde supplied by the protection of cloud forests in a nature reserve	Unclear.
Costa Rica	Debt-for-nature swaps	Mature	By 1990 some US\$100 million worth of Costa Rican commercial debt had been exchanged for US\$20 million by Holland and Sweden.	Biodiversity protection in private forest areas under the government's Payments for Environmental Services programme.	Government intermediary.
Costa Rica	Biodiversity-friendly cocoa	Nascent/pilot	In the short term demand has come from donors, e.g. GEF and World Bank. Future demand expected from cocoa retailers.	Cocoa produced without chemical inputs and by inter-cropping trees. Local communities in buffer zones of the Mesoamerican biological corridor.	Bilateral negotiation and, later, retail-based market.
Costa Rica	Monteverde Coffee - biodiversity friendly coffee	Emerging	Montana Coffee Traders Inc. (USA) markets the coffee to final consumers in the US. Supported by The Nature Conservancy.	Eighty coffee growers located around the Monteverde Cloud Forest Reserve and organised through the Santa Elena Cooperative.	Retail-based market & NGO intermediary.
Ecuador	Ethno-bioprospecting - access rights	Proposal	Users of biodiversity, e.g. biotechnology firms, research institutions, academics, NGOs, etc.	Government regulates access to a confidential database of taxonomic and ethno-botanical records. Communities that contribute to the database, share in rents.	Clearing-house mechanism.
Ecuador	Debt-for-nature swaps	Pilot (1987, 1989)	World Wildlife Fund and The Nature Conservancy paid US\$1.42 million.	Fundación Natura (a local NGO). Conservation involving local communities.	Pooled transaction & trust fund intermediary.
Ecuador	The Tagua Initiative – biodiversity friendly accessories.	Pilot/nascent	Garment manufacturers (e.g. The Gap, Esprit, Timberland, and Smith & Hawken) purchase Tagua (resembles ivory) products, which they then sell as biodiversity-friendly.	Rural Ecuadorian harvesters supply Tagua nuts from around the Cotacachi-Cayapas Ecological Reserve.	Retail-based market and NGO (Conservation International) intermediary.
El Salvador	Biodiversity-friendly coffee	Emerging	Ultimately demand from coffee retailers who pay a premium for biodiversity-	Biodiversity protection is provided through the adoption of shade coffee	Project-based and retail-based market.

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			friendly coffee. Initial support from the GEF, Sustainable Harvests and Rainforest Alliance.	in place of modern monoculture sun coffee plantations in 75,000 ha near the Mesoamerican Biological Corridor	
Fiji	Strathclyde Institute - access rights	Pilot	Strathclyde Institute of Drug Research of the University of Strathclyde in Glasgow, Scotland.	The Tikina county of Verata in Fiji. Community-based conservation projects to preserve habitats and species.	NGO and Community Trust Fund intermediaries.
Fiji	Trust Fund for biodiversity conservation	Mature	Conservation International	Forest protection in the Sovi Basin	Trust fund.
Ghana	Time-Debt Swaps	Pilot/nascent	International NGOs and donors wishing to invest in local conservation efforts.	The government will supply debt-swaps of up to US\$2 m/month. Funds may be used for a range of activities, including conservation.	Over-the-counter transaction and clearing-house.
Guyana	Conservation Concession	Pilot - exploratory permit issued in 2000	Conservation International and its sponsors. During the exploratory permit phase, paying \$0.15/acre/year, plus a \$20,000 up-front application charge.	Guyana's government issued a 3 year exploratory permit in 200,000 acres. The area may be expanded if awarded a longer-term concession.	Bilateral negotiation.
India	Paying for ethno-biological knowledge and access rights in Kerala	Nascent/pilot	The Tropical Botanical Garden and Research Institute, an autonomous government plant research institute. The Institute offered US\$12,500 plus 50% of any future royalties	Forests in the Agasthyamalai hills controlled by the Forestry Department, the Kanis tribals provided <i>de facto</i> access rights and information on the plant's medicinal properties.	Trust fund intermediary (Kerala Kani Community Welfare Trust).
India	Harda (Madhya Pradesh) – protected areas	Emerging	The Government of India. At the local level, willingness to pay comes from the State Forestry Department.	Forest protection by local communities (Village Protection Committees), with the support of Forestry Department staff.	Bilateral negotiation and a Village Common Fund.
Indonesia	Wasur Project – protected areas	Mature	World Wildlife Fund.	Forest protection by three aboriginal communities who live in the Park	Direct negotiation - form of integrated conservation and development programme.
Jamaica	Debt-for-nature swap	Mature	USAID, the Conservation Trust of Puerto Rico, the Smithsonian Institution, Fidelity Investments and The Nature Conservancy purchased US\$530,000 debt.	Jamaica's national parks.	Pooled transaction and trust fund intermediary (Jamaican National Parks Trust Fund)
Malawi	Malawi Environmental Endowment Trust – biodiversity company shares	Nascent/pilot - incorporated in 1999	USAID (US\$5 million), DANIDA (\$2 million) and UNDP.	Invest in shares of biodiversity friendly enterprises.	Trust fund intermediary & pooled.
Malawi	Mulanje Mountain	Nascent/pilot –	A capital fund of US\$5 million requested	Conservation of the Mulanje massif,	Trust fund intermediary

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	Conservation Trust – protected area	agreed in 2000	from the GEF/World Bank.	the third largest mountain in Africa.	
Mexico	El Triunfo Biosphere Reserve – Biodiversity-friendly coffee	Emerging	The GEF, The Nature Conservancy, Starbucks, Ford Motor Company, National Arbor Day and Conservation International. In the longer-term, coffee consumers through a price premium.	Adoption of biodiversity-friendly coffee production techniques by communities within and around the El Triunfo Biosphere Reserve.	Pooled transaction and retail-based market.
Mexico	Northern Chihuahua – biodiversity management contract	Pilot in 2000	Six environmental organisations wishing to protect the habitat for the endangered western thick-billed parrot.	Protection of 2,400 ha of old-growth forest - 50% of the remaining nesting habitat - by the local Cebadillas community.	Pooled transaction.
Mexico	Biodiversity-friendly cocoa	Mature - since 1994	Cloud Nine, US organic chocolate manufacturer, pays 20-30% premium (US\$150-200/MT) for certified organic and biodiversity-friendly cocoa. Also has donated 19% of pre-tax profits for rainforest protection and indigenous people.	Growers' association with 150 members in Chiapas, Mexico and the Authentic Chocolate Company, a processor in Mexico City.	Retail-based market and NGO intermediary.
Netherlands	Biodiversity offsets	Mature - Forest Law of Natural Areas (1994)	Developers who damage an area of biodiversity are required to offset this damage.	Government establishes zones according to their biodiversity value, and permits offsets within zones, at a rate of 3:1, i.e. 1 ha of damaged biodiversity must be offset through protection in 3 ha in the same zone.	Direct negotiation or clearing-house.
Nigeria & Cameroon	The African International Cooperative Biodiversity Group (ICBG) - biodiversity access rights	Pilot 1997	A coalition of 16 US and Africa institutions including the Bioresources Development and Conservation Programme (a US NGO), the Walter Reed Army Institute of Research, Biodiversity Support Programme and the Smithsonian Tropical Research Institute. Shaman Pharmaceuticals has also donated funds.	Nigeria and Cameroon's rainforests, particularly in the Cross River/Niger, Imo River Basin and Korup National Park. Protection by a number of groups including traditional healers' associations, local communities, universities, etc.	Pooled transactions, trust fund intermediaries (Global Fund for Health and national sinking trust funds) & integrated conservation & development projects.
Pakistan	Northern Pakistan – protected areas	Pilot in 1995	GEF provides \$2.5 million.	Local communities through sustainable forest management, with support from IUCN and the Ministry of Environment, Local Government and Rural Development.	Project-based and trust fund intermediary (Biodiversity Trust Fund).
Peru	Biodiversity-friendly coffee	Emerging	Conservation International is paying start up costs and expects to generate continued payments from retailers of coffee.	Local communities in the Tambopata-Candamo Reserve Zone, home to 12% of the world's bird species and over 1,200 butterfly	Direct negotiation and, later, retail-based sales.

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				species.	
Peru	Rainforest Cookies	Emerging	Conservation International and Subway Sandwich Company channel a share of profits from cookies sales to biodiversity protection.	Rainforest protection by local communities in Brazil.	Retail-based payments.
Philippines	Deb-for-nature swap	Pilot in 1989-1992	USAID and WWF-USA purchased US\$2 m worth of debt for biodiversity conservation in the Philippines.	National Park conservation by the Government, local NGOs (Haribon, the Tubbataha Foundation, and the Philippine Business for Social Progress) and communities.	Pooled transaction and NGO intermediary.
Philippines	Foundation for the Philippine Environment - debt-for-nature swap	Mature	USAID acquiring debt worth US\$9.8 million in 1992 (\$26 m in local currency). WWF and the Bank of Tokyo also contributed.	Conservation by NGOs and communities.	Pooled transaction and Trust Fund intermediary (the Foundation for the Philippines Environment).
Philippines	World Land Trust – land acquisition	Mature	World Land Trust on behalf of its corporate, NGO, government and private sponsors	Purchase of Danjungan Island in the Visayan Island Group.	Direct negotiation.
Russia	Talan - payments by an ecotourism company for biodiversity protection	Pilot/nascent	Talan, an ecotourism company set up by scientists from the Institute of Biological Problems of the North (part of the Russian Academy of Sciences).	Talan Island's biological research station receives funds to preserve biodiversity on the island, home to some of Russia's largest seabird communities.	Direct payment.
Suriname	International Cooperative Biodiversity Group project – biodiversity access rights	Pilot in 1993	Consortium of drug developers: Virginia Polytechnic Institute and State University; Bedrijf Geneesmiddelen Voorziening Suriname (government pharmaceutical company); Missouri Botanical Gardens; and Bristol-Myers Squibb Pharmaceutical Research Institute (a US commercial pharmaceutical company). An initial \$50,000 paid in 1993, was topped up with another \$10,000 in 1996.	Suriname's forest custodians: the Forest Service, the Foundation for Nature Preservation in Suriname (a NGO responsible for the management of National Parks), Conservation International-Suriname and the Saramake Marron tribe.	Pooled transaction, trust fund intermediary and integrated conservation and development project.
Switzerland	Ecological compensation programme – biodiversity management contracts	Mature - initiated in 1993	Government	The conversion of agricultural land to protected habitats.	Over-the-counter contracts to farmers.
Uganda	Mgahinga-Bwindi Impenetrable Forest Conservation Trust – protected area	Pilot	Donors (GEF, USAID, WB), World Wildlife Fund and the Government of Uganda.	Local communities forest conservation and government investment in national park.	Pooled transaction & trust fund intermediary.
USA	Yellowstone National	Pilot	Diversa Corporation, a pharmaceutical	Geothermal waters of Yellowstone	Bilateral negotiation.

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	Park - Research Specimen Collection Permit		company, paid US\$100,000/yr for five years; in-kind services and resource worth US\$375,000; and a share of the royalties from future commercialisation (0.5-10%)	National Park. The Park is administered by the National Park Service under the Department of the Interior.	
Vietnam & Laos	International Cooperative Biodiversity Group-biodiversity access rights	Pilot/nascent - initiated in 1998	The Fogarty International Centre and drug research and development partners from UIC and Glaxo-Wellcome Research and Development Ltd.	Vietnam Cuc Phuong National Park covering 20,000 ha of primary forests and forests throughout Laos focusing on 10 known Traditional Medicine Stations. The project will work with local communities (e.g. the Muong communities in Vietnam).	Pooled transaction, Trust Fund and Integrated conservation and development projects.
West Africa (Ghana, Cote d'Ivoire)	Shade cocoa in the Upper Guinean forest	Proposal	Conservation International pays 5% premiums for shade cocoa production plus post-harvest bonuses. The project will help develop a wider export market for biodiversity-friendly cocoa.	Shade cocoa is produced through inter-cropping cocoa plants with diverse tree species. Small-holders are the main suppliers.	Retail-based market.

Private sector & international agency initiatives

Initiative	Market Status	Market demand	Market supply	Mechanism
Earthcall Telecommunications Ltd.	Pilot/nascent	Earthcall customers, general public through donations and Earthcall's Business Alliance Partners: Cable and Wireless, Media City 2000, and idesk.	Forest habitat and species protection, and through educational campaigns.	Retail-based payments, trust fund and NGO intermediary.
Critical Ecosystems Partnership - payments for hotspot protection	Pilot/nascent - first fund disbursement in Feb 2001	Conservation International, the World Bank, GEF and other donors. The three founding institutions have pledged to contribute \$75 m over five years. Another \$75 m will be contributed by other donors.	Conservation of hotspots, starting with Madagascar, West Africa (Sierra Leone, Liberia, Cote Ivoire, Ghana, Togo), and the Tropical Andes (Vilcabamba-Amboro Corridor located in Peru and Bolivia). Every year an additional five critical ecosystems will be added.	Pooled transactions and trust fund intermediary (Critical Ecosystem Partnership Fund).
Global Environment Emerging Markets Fund - biodiversity business shares	Emerging - 1994	Private equity investors, portfolio investors and investment banks. The Global Environment Emerging Markets Fund is worth US\$70 million.	The fund invests in a range of biodiversity-friendly businesses in developing countries.	Venture capital intermediary (GEEMF).
Small and Medium Enterprise Programme - biodiversity business shares	Emerging	US\$16 million of GEF funds contracted to the the International Finance Corporation.	Biodiversity businesses including those in the forestry sector.	Venture capital intermediary.

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Kijani Initiative - biodiversity business shares	Proposal – operational in 2002	International Finance Corporation and IUCN initiative to promote biodiversity business in Africa. Initial support for the Bio-Service comes from GEF in the form of a grant.	Businesses focusing on organic agriculture, ecotourism, sustainable forestry, NTFPs, medicinal plants, sustainable fisheries and aquaculture.	Venture capital intermediary
Botanical Garden Trading Company Ltd - access rights and Hotspot conservation	Pilot	Botanical Garden Trading Company Ltd. aims to return 2.5% of company turnover to conservation initiatives and to pay for access fees to biodiversity in these areas.	Biodiversity protection in 'hotspots' for horticulture products.	Bilateral transactions and NGO intermediary (Botanic Garden Foundation)
GEF - biodiversity protection	Mature	GEF represents the financing mechanism for the Convention on Biological Diversity. Between 1992-2000 GEF paid US\$1.18 billion for biodiversity conservation in 123 countries.	Forestry was the most important spending area in 1992-2000, receiving at least \$505.92 million. Forest biodiversity protected through protected areas and sustainable use. Government and local community participation sought.	Pooled transaction & sinking trust fund.
American Cocoa Research Institute Shade Cocoa Programme	Pilot - initiated 1999	Chocolate manufacturers interested in ensuring the sustainability of cocoa supplies.	Maintenance of biodiversity through inter-cropping cocoa with other tree species. Prioritising smallholder land in developing countries.	Pooled transactions and, later, retail-based market.
Community Products Inc - payments for forest conservation		Community Products Inc, was set up by Ben and Jerry's ice cream to supply biodiversity-friendly nuts. 60% of profits go to environmental and peace organisations		Retail-based payments
The Enterprise for the Americas Initiative – debt- for-nature swap	Mature - initiated in 1993	US government. The Enterprise for the Americas Initiative exchanged US\$875 million worth of debt for \$650 million investments in Latin America by 1999.	Environmental conservation in debtor countries.	Trust funds and bilateral negotiation.
Terra Capital Investors Ltd - purchase of biodiversity business equity	Emerging - initiated in 1998	Investors include: the International Finance Corporation, the Swiss government agency for economic cooperation, Multilateral Investment Fund of the Inter-American Development Bank, Triodos Bank (Brazil) and private institutional investors. GEF provided a US\$5m grant. Total funds come to approximately US\$15 million.	Variety of small and medium biodiversity businesses, including organic agriculture, NTFPs, forestry, aquaculture and ecotourism in Latin America.	Venture capital fund (Terra Capital Investors Ltd.) .
Eco-Enterprises Fund - biodiversity business shares	Pilot/nascent	The Nature Conservancy, Inter-American Development Bank and other investors. US\$10 million is targeted over ten years	NGO-private sector biodiversity businesses that invest in sustainable agriculture, NTFP production, sustainable forestry or ecotourism.	Venture capital fund (Eco-Enterprises Fund).

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The Environmental Enterprise Assistance Fund's Corporación Financiera Ambiental - biodiversity business shares	Emerging - set up in 1998	US\$10 million invested in the fund by the Multilateral Investment Fund of the Inter-American Development Bank, the Swiss Office of Foreign Economic Affairs, Swedfund International AB and FINNFUND, Stichting Hivos-Triodos Fonds, Citizen's Energy Corporation and Global Partners Fund.	Environmental sector projects, including forest biodiversity conservation. Examples of forestry sector support include a start-up plantation company in Costa Rica and a nature tourism lodge in the Central American Biological Corridor.	Venture capital intermediary (Corporación Financiera Ambiental).
Café Ibbis - biodiversity-friendly coffee	Emerging	Caffe Ibbis specialises in mountain grown, shade grown, fair-traded, certified organic coffees. It aims to capture willingness to pay from customers.	Coffee growers in Latin America (Costa Rica, Chiapas (Mexico), Colombia, Peru, Brazil).	Retail-based market.

Case studies for carbon sequestration markets

Country	Project	Market status	Market demand	Market supply	Mechanism
Argentina	La Plata/ Fontana, Patagonia	Pilot - initiated in 1999	German and Argentine Governments will share the carbon offsets.	Avoided emissions and sequestration in a water catchment area of La Plata/Fontana - 120,000 ha of native forests.	Bilateral negotiation.
Australia	National credit scheme	Proposal	Companies that expect to exceed Emission caps	Companies who generate cheap credits through emission abatement as well as sinks, e.g. reforestation.	Over-the-counter credits transaction.
Australia	Bush for Greenhouse Programme	Pilot -launched 2000	Companies interested in offsetting carbon emissions.	Landholders that sign contracts committing them to maintain a pool of carbon sinks.	Broker-based transactions.
Australia	Australian Plantation Timber sale of carbon credits	Pilot trade June 2001	Cosmo, Japan's third largest oil refiner, purchased US\$500,000 carbon credits as well as options on future credits worth \$18 million.	Australian Plantation Timber sold carbon credits from 10% of tree crop, covering 5,092 ha.	Intermediary-based.
Australia (New South Wales)	Sales of CO ₂ tradable rights by New South Wales State Forests	Emerging	Private companies have been major buyers to date, including Pacific Power, Delta Energy, and Tokyo Electric Power Company.	New South Wales State Forests through the establishment and maintenance of a portfolio of forests in state or leased private lands.	Bilateral negotiation, gradually replaced with over-the-counter and exchange-based trading.
Australia (Queensland)	North American purchasing consortium	Pilot - launched in 1998	A North American-Australian petroleum consortium including Suncor Energy Inc., Southern Pacific Petroleum, and Central Pacific Minerals	Reforestation trials involving planting eucalyptus in four marginal plantation locations covering over 150 ha. Implemented through the State Natural Resource Department, in partnership with local landowners.	Pooled transaction and government intermediary.
Australia (Victoria)	Landcare forestry investment & Bush for Greenhouse	Pilot - being finalised in 2001	Edison Mission Energy a major international electricity utility, Invested A\$1 m in five year land care initiatives.	More than half of the \$1 million in funding will go to 13 groups of landholders in Wellington Greenprint to invest in farm planning, native seed collection and revegetation.	Government intermediary.
Australia (Victoria)	Australian Afforestation Pty. Ltd. - afforestation for timber and carbon	Emerging - initiated in 1998	Toyota Motor Corporation, Mitsui & Co. and Nippon paper Industries Co. entered a joint venture to establish plantations for the timber and carbon benefits.	Australian Afforestation Pty. Ltd. will plant trees for pulpwood and carbon. A total of 5,000 ha of eucalyptus will be planted. Toyota will earn the carbon credits.	Joint venture.
Australia (Western Australia)	Western Australia EcoCarbon	Pilot launched in 1999	Local BP Kwinana Refinery set out plans to invest A\$500,000 per year in carbon sequestration in 2000.	Planting of 1.4 million trees on 14 farms, approximately 330 ha, since 1999. Estimated sequestration about	Government intermediary - the Conservation and Land Management (CALM), now the

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	Initiative			20 tCO ₂ /ha/yr.	Forest Products Commission.
Belize	Rio Bravo Conservation Project	Pilot - 1994 (USIJI)	The Nature Conservancy, Winrock International and six energy companies (Wisconsin Electrical Power Company, Detroit Edison Corporation, Cinergy, Pacificorps, Suncor and Utilitree Carbon Company) are the investors. A total US\$5.6 m over the first ten years.	The project is expected to sequester 2.4 million tC over 40 years, through the conservation of 59,720 ha of mixed lowlands, moist subtropical broadleaf forests in NW Belize.	NGO intermediary (Programme for Belize), pooled transaction & trust fund.
Bolivia	Noel Kempff Climate Action Project	Pilot	\$7 million invested by three private energy companies (American Electric Power Systems (USA), Pacificorp (USA) and BP America (UK)). Carbon credits are divided as follows: 49% Government, 51% private investors.	Carbon offsets are earned through the conservation of 634,286 ha of forest from logging adjacent to the Noel Kempff National Park. The area will sequester up to 14 million tC over 30 years.	Pooled transaction, NGO intermediary (Fundación Amigos de la Naturaleza) & trust fund.
Brazil (Mato Grosso)	Peugeot investment in carbon offsets	Pilot	PSA Peugeot Citroën is investing FF 65 million over three years.	The State of Mato Grosso is planting 10 million trees in 12,000 ha to create a carbon sink that stores 50,000 tC/yr.	Bilateral negotiation.
Brazil (Parana)	Atlantic Forest protection for carbon	Pilot	Central & Southwest Utilities, a Texan electricity company, is purchasing 1 million tC over 40 years through a US\$5.4 million investment.	(1) forest regeneration of 8,100 ha within the Guaraquecaba Environmental Protection Area (500,000 tC); (2) the protection of existing forests; and (3) reducing carbon emission by about 500,000 tC.	NGO intermediary & trust fund: the project is implemented through a local conservation group, the Sociedade de Pesquisa em Vida Selvagem. A trust fund will be established to ensure permanent forest protection.
Burkina Faso	Sustainable Energy Project	Pilot - initiated in 1997	The Government of Norway is paying \$2.4 million.	45,000 tCO ₂ will be abated over six years from 1997 through improved forest management in 300,000 ha. Sustainable forestry is being implemented by the Direction de la Foresterie Villageoise et de l'Amenagement Forestier.	Project based.
Canada (Alberta, British Columbia and Saskatchewan)	KEFI-exchange - carbon credit trading	Pilot - in 1999 and opened in May 2000	Electricity generators that exceed the industry average emission levels for Alberta, British Columbia and Saskatchewan, and who wish to improve performance.	Carbon credits are supplied by electricity generators that outperform, achieving emission levels below the sector average. There are plans to extend the scheme to include soil and forest operators.	Exchange-based trading - the KEFI-exchange (thousand (K) Emission Free Index points) has developed internet emission trading.
Canada	GHG Emission Reduction Trading (GERT) scheme	Pilot since 1998	The scheme was set up by a multi-stakeholder grouping, including the Canadian Association of Petroleum Producers, Canadian Electricity	Organisations that invest in emission reduction projects and are certified by a multi-stakeholder review committee. Forest projects are permitted. By May	Clearing-house mechanism/exchange - a baseline and credit scheme, GERT aims to encourage project based reductions

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			Association, Canadian Pulp and Paper Association, GEMCo.	2001, three trades had been completed.	in emissions through crediting and trading.
Canada	Pilot Emission Reduction Trading (PERT) scheme - trading air pollutants, e.g. NO _x , volatile organic compounds, SO ₂ , CO ₂	Pilot since 1996 - covers CO ₂ and SO ₂ since 1997	Large-scale GHG emitters that exceed self-imposed targets.	Companies that undershoot emission limits and can sell credits. By May 2001, a total of 28 trades had occurred. No forestry projects agreed to date.	Exchange.
Costa Rica	Certified Tradable Offset (CTOs)	Emerging - since 1996	International private sector, donors, NGOs and foreign governments wishing to offset carbon emissions.	CTOs are sold by the Costa Rican Office for Joint Implementation, which purchases carbon sequestration from private landowners through 20 year contracts (via the National Forestry Fund).	Bilateral negotiation, over-the-counter and clearing-house approach.
Costa Rica	Norway purchase of CTOs - AIJ project	Emerging	The Government of Norway and a Norwegian consortium of private firms agreed to purchase 249,242 tC over 25 years at a cost of \$3.4 m.	Reforestation of 1,000 ha, conservation of 3,000 ha forest in the Virilla River basin. Undertaken by farmers and will provide 249,242 tC over 25 years.	Bilateral negotiation, over-the-counter and clearing-house approach.
Costa Rica	Biodiversifix (AIJ project)	Pilot	The Nature Conservancy is financing project, but demand for carbon offsets is expected from private carbon emitters.	Forest regeneration and management of degraded land in and near the Guanacaste Conservation Area.	Bilateral negotiation & over-the-counter.
Costa Rica	CARFIX (AIJ approved 1994)	Pilot	The Costa Rican Office for Joint Implementation obtains CTOs for sale to private emitters.	Carbon offsets worth about 21.8 million CO ₂ will be provided over 25 years through reforestation, sustainable forestry and natural regeneration in the Central Volcanic Conservation Area.	Bilateral transaction and over-the-counter.
Costa Rica	ECOLAND (AIJ approved 1994)	Pilot	Foreign investors include: Regenwald der Osterreicher (Austria), Tenaska Washington Partners II, L.P. (USA), Trexler and Associates, Inc. (USA) and National Fish and Wildlife Foundation (USA).	Carbon offsets of 1.3 m tCO ₂ (235 tC/ha) are generated over 16 years through protection of the Piedras Blancas National Park by FONAFIFO. A total of 2,500 ha are being protected by the project.	Pooled transaction, clearing-house mechanism, over-the-counter and trust fund.
Costa Rica	Klinki Forestry Project (AIJ project approved 1995)	Pilot	Foreign participants include: Reforest the Tropics, Inc., US Department of Agriculture Forest Products Laboratory and the Yale School of Forestry and Environmental Studies.	The establishment of fast-growing plantations in 6,000 ha of pastures and marginal private farmland. The project will sequester 7,216,000 tCO ₂ . The approximate cost \$1.478/ tCO ₂ .	Pooling, clearing-house mechanism and over-the-counter.
Costa Rica	Prototype Carbon	Proposal	World Bank's Prototype Carbon Fund	Carbon offsets from renewable energy	Pooled transaction, clearing-house

Country	Project	Market status	Market demand	Market supply	Mechanism
	Fund - Fund for Renewable Energy		representing a compilation of investors from around the world. Total proposed investment is \$10 m.	projects. Forestry is supported for its contribution to small hydroelectric plants.	mechanism & over-the-counter.
Czech Republic	Krkonoše (Giant Mountains) National Park – a FACE project	Pilot - launched in 1992	Sep (the Dutch Electricity Generating Board) to offset carbon emissions from Dutch coal-fired power stations.	Carbon offsets from the restoration of a large protected forest area severely degraded by acid rain.	NGO (Face Foundation) intermediary-based transaction.
Czech Republic	Sumava National Park – a FACE project	Pilot - launched in 1994	Sep (the Dutch Electricity Generating Board) to offset carbon emissions from Dutch coal-fired power stations.	The project aims to counter forest degradation resulting from an outbreak of spruce bark beetle in 5,000 ha.	NGO (Face Foundation) intermediary-based transaction.
Denmark	Emissions trading scheme for electricity plants	Launched in January 2001	Eight electricity plants with over 30 MW capacity that exceed their emission cap.	Electricity plants with over 30 MW capacity that undershoot cap and can sell excess emission permits.	Over-the-counter, intermediary and bilateral negotiation.
Ecuador	Programme FACE de Forestación (PROFAFOR) – a FACE project	Pilot	Sep (the Dutch Electricity Generating Board) to offset carbon emissions from Dutch coal-fired power stations.	The Ecuadorian Forestry Department, INEFAN, to reforest 75,000 ha of land in the Andes. The project is implemented by farmers.	NGO (Face Foundation) intermediary-based transaction.
Ecuador	Bilsa Biological Reserve		The World Parks Endowment Inc, of the US purchased 1.2 million tCO ₂ worth of avoided emissions for \$380,000.	The conservation of 2,000 ha of tropical forest in the Montanas de Mache in the Esmeraldas province of NW Ecuador.	Trust fund.
Guatemala	Reforestation and carbon sequestration	Pilot when initiated in 1988	Applied Energy Services, Inc. donated \$2 million for agroforestry projects in Guatemala to absorb the carbon emitted from a new 183 MW coal-fired power plant in Connecticut.	40,000 family farms in Guatemala through tree planting, as part of agroforestry systems and tree farms. An estimated 11.2 million tC supplied over 40 years.	Trust fund & NGO intermediary - CARE was hired as an intermediary for managing the Guatemalan project.
Honduras	Biomass power generation (USIJI project)	Pilot	The International Utility Efficiency Partnership, Nations Energy Corporation, and Add-on-Energy of the US are paying for carbon offsets.	Carbon offsets are supplied by Biomasa-Generacion through the establishment of 45 MW biomass waste-to-energy power plants.	Pooled transaction.
Indonesia (Borneo)	Reduced Impact Logging in East Kalimantan (USIJI)	Pilot in 1997	COPEC, a project developer, and American Forests have approached various investors with preliminary information.	Replacement of conventional logging with reduced impact logging in private logging concessions.	Multi-stakeholder negotiations.
Malaysia	Infapro - a FACE project	Pilot -launched in 1992	Sep (the Dutch Electricity Generating Board) to offset carbon emissions from Dutch coal-fired power stations.	Offsets through enrichment planting by part of the Innoprise Corporation, a semi-government body in 14,000 ha of damaged forests in Northern Borneo.	NGO (Face Foundation) intermediary-based transaction.
Malaysia	Reduced impact	Pilot - initiated	New England Power Company, a US	Carbon offsets are generated through	Project-based bilateral transaction.

Country	Project	Market status	Market demand	Market supply	Mechanism
	logging in Sabah	in 1992	electricity company, purchased carbon offsets at cost-price.	the replacement of selective logging with reduced impact logging by Innoprise Corporation, a semi-government organisation in 1400 ha between 1992-1995.	
Mexico	Agroforestry in Scolel Te (AIJ) - protocarbon credits	Pilot	American Forests and Econergy International Corporation demanding 15,000 tC offsets for \$10/tC.	A cumulative 15,000-330,000 tC are expected to be sequestered through a range of agroforestry and forestry activities in 2,200 ha. Local communities contracted for 25 years.	Trust Fund intermediary & over-the-counter "protocarbon credits" are sold.
Mexico	Community silviculture in Sierra Norte, Oaxaca (AIJ)	Pilot	Econergy International Corporation of the US. Cumulative net GHG benefits are estimated at 3.1 million tCO ₂ over 30 years.	Carbon sequestration is provided by 6 communities in Sierra Norte of Oaxaca through agroforestry, plantation establishment and reduced impact logging in degraded forests.	Community intermediaries: UZACHI and IXIETO.
Mexico	Chiapas carbon offsets	Potential	International demand from Annex B countries and private companies	Carbon offsets provided by farmers through forestry activities.	Direct negotiation.
Mexico	Halophyte Cultivation in Sonoro (registered USIJI project)	Pilot	Planetary Design Corporation, Salt River Project and Econergy International Corporation from the USA. A Mexican company, Genesis SA de CV is also investing.	Carbon sequestration will be provided through the planting of Salicornia plant in salt water and its cultivation.	Pooled transaction.
Netherlands	Emission Reduction Units (EMUs) Permit Trading (ERUPT)	Pilot - initiated in 2000	Dutch government intends to purchase 125 million tC to comply with its Kyoto obligations for 2008-2012.	EMUs are to be delivered through JI and CDM projects.	Auction & over-the-counter purchases - ERUPT system involves competitive bids for supply of Emission Reduction Units.
Panama	Reforestation in Chiriqui Province (USIJI)	Pilot	The Center for Clean Air Policy (USA) and two Panamanian companies, CAOBO, Inc. and an NGO Fundacion NATURA.	Reforestation of 500 ha degraded lands with teak plantation and through avoided emissions from deforestation of existing forests.	Pooled transaction.
Panama	Reforestation bonds in Darien	Proposal	The government and the private sector. Government payments funded through a fuel tax.	The Darien National Park sequesters carbon worth \$24.5 million. Sustainable forestry could fix 16,250 tC/yr. Forestry and agroforestry plantations will fix 18,750 tC/yr.	Over-the-counter contracts.
Paraguay	Mbaracayu initiative	Pilot	Applied Energy Services to offset emissions from its 180 MW coal-fired power plant in Oahu, Hawaii.	60,000 ha protected reserve to offset 14.5 m tC.	NGO-intermediary – The Nature Conservancy.
Peru, Bolivia, Ecuador	Applied Energy Services, Inc Shady Point	Initiated in 1993	Applied Energy Services, Inc Shady Point (USA) sought carbon offsets for its power plant in Oklahoma.	Forest protection in indigenous territories of the Amazon. The Indigenous Peoples Organisation of the	NGO broker & intermediary – the World Resources Institute acted as a broker identifying and designing

Country	Project	Market status	Market demand	Market supply	Mechanism
				Amazon Basin organised forest protection in 1.2 m acres over ten years, to generate 70 m tC.	the project. OXFAM America will implement the project.
Poland	Wroclaw – a FACE project	Pilot initiated in 1998	Sep (the Dutch Electricity Generating Board) to offset carbon emissions from Dutch coal-fired power stations.	In 1998 Face planted 15,100 ha in partnership with the Wroclaw municipality along two tributaries of the Oder River.	NGO (Face Foundation) intermediary-based transaction.
Russia	RUSAFOR Saratov Afforestation Project - USIJI	Pilot - approved in 1995	The US Environment Protection Agency and Oregon State University	By 1998 the project had planted 900 ha in marginal agricultural land or burned forest stands on four sites.	Government & private intermediaries
Russia	Vologda reforestation project - USIJI	Pilot - initiated in 1996, then suspended	Purchasers of carbon offsets are being sought and the Utility Forestry Carbon Management Programme of the Edison Electric institute has been approached.	The conversion of about 2,000 hectares of hayfields in Vologda's collective farms into natural forest through natural regeneration and planting.	Private broker/intermediary - New York-based Environment & Economic Consulting is acting as a broker.
Russia	Energy Carbon Fund	Proposed in 2001	Western investors interested in purchasing carbon credits	Excess AAUs not used by Russia as well as carbon credits through JI projects. Emphasis is placed on energy efficiency projects, but others would also be eligible.	Over-the-counter & clearing-house transaction - a clearing-house would be established by building on UESR's Energy Carbon Fund set up in Feb 2001.
Tanzania	Tree Farms AS carbon forward option	Pilot - initiated in 1996	Private emitters in Norway. In 1996, Industrikraft Midt-Norge, a gas-fired power plant, agreed an options contract for carbon offsets. Cancelled in 2000.	Carbon offsets are to be supplied through afforestation using eucalyptus and pine in barren lands in East Africa.	Direct negotiation - deals have been negotiated directly between Tree Farms and Industrikraft Midt-Norge.
Uganda	Uganda Wildlife Society – a FACE project	Pilot - initiated in 1994	Sep (the Dutch Electricity Generating Board) to offset carbon emissions from Dutch coal-fired power stations.	Reforestation 27,000 ha in two national parks: the Mount Elgon National Park and Kibale National Park.	NGO (Face Foundation) intermediary-based transaction
Uganda	Tree Farms AS - carbon forward option	Pilot - initiated in 1996.	Private emitters in Norway. Industrikraft Midt-Norge, a Norwegian power company, purchased a forward option, but in 2000 cancelled this purchase.	Carbon offsets are supplied by Tree Farms' plantations in Tanzania and Uganda. About 2.13 million tCO ₂ for Tree Farms' 4,260 ha in Uganda at the end of 25 year rotation.	Direct negotiation - bilaterally agreed future option between Tree Farms AS and Industrikraft Midt-Norge.
United Kingdom	Emission Trading Group	Proposed market for April 2002	Companies that emit more than their agreed cap can purchase offsets from other participating entities.	Companies that adopt absolute emission targets that undershoot emission caps can sell credits. The scheme will be extended to permit the purchase of credits under CDM and JI to fit in with Kyoto requirements. Forest-based credits are not currently allowed, but this will be reviewed.	Exchange, brokers and bilateral deals.

Country	Project	Market status	Market demand	Market supply	Mechanism
United Kingdom	North Sea gas flare emission "consent" trading	Pilot launched in January 2001	11 oil and gas companies (e.g. Amerada Hess, BP Amoco, Royal Dutch/Shell and Texaco) with offshore platforms that exceed their "stretch targets".	Oil and gas offshore platforms which undershoot their "stretch targets" and have spare emission consents	Over-the-counter & exchange-based trading - trading will ultimately be held through internet exchange.
United Kingdom	Greenery - carbon certified electricity	Emerging	Environmentally-conscious consumers	Greenery is a UK-based responsible energy company offering carbon-certified electricity by blending different source of electricity to achieve carbon emissions demanded by consumers.	Retail-based market.
United Kingdom	Climate Care Warranties	Emerging	Climate Care is selling its warranties to companies (producers and retailers) to offer their clients the option of purchasing carbon neutral products.	Climate Care warranties are supplied by the Carbon Storage Trust, an NGO. Carbon offsets come from a range of schemes. Currently forestry schemes in developing countries represent 100% of offsets.	Retail-based trades.
USA	The Sky Trust - carbon emission permits	Proposed for start in 2003	Emitters using the sky to dump their (carbon) emissions would have to pay for this service through the purchase of permits.	A total of 1.346 billion metric tC would be allocated initially, equal to the US emissions in 1990, but an unlimited additional amount of permits would be available at the given year's ceiling price	Auctions - right to emit would be auctioned and funds raised would be reallocated to US citizens.
USA	Environmental Synergies, Inc.	Emerging	Electricity and fossil fuel-based companies interested in carbon credits.	Reforestation projects involving native forest habitat.	Broker-based trade.
USA	Forest Forever Fund - conservation easements and carbon credits	Nascent	Carbon producers, e.g. power companies, petrochemical producers, car manufacturers interested in offsetting carbon emissions	Private landowners enter into conservation easement agreements that require long term forest stewardship.	NGO intermediary - Pacific Forest Trust through its Forest Forever Fund.
USA (Oregon)	Carbon offset projects	Pilot state initiative since 1997	In 1997 Oregon introduced a requirement that all new power plants offset 17% of their CO ₂ emissions.	Supply will be through a number of projects including land-based offsets, e.g. forest protection and reforestation.	Trust intermediary - The Climate Trust is managing projects to supply desired carbon offsets.
USA (Montana)	Montana Offset Coalition	Emerging	The Coalition sells carbon credits to private companies and others.	Supply from non-federal forest or agricultural landowners using: (1) legal contract that protects the trees though the life of the project and (2) conservation easements.	Clearing-house & broker-based - The Montana Offset Coalition acts as a clearing-house. To find clients Montana Offset Coalition may work with brokers.
Vietnam	Plantations in central and southern Vietnam - AIJ	Pilot - aimed at research	Property rights over carbon offsets will remain with the Vietnam government to sell to interested buyers.	Carbon offsets of 21,5000 tCO ₂ per year will be achieved through genetically improved planting in central and southern Vietnam.	Direct negotiation

Multinational enterprise initiatives

Initiative	Market status	Market demand	Market supply	Mechanism
Shell's Tradable Emission Permit System (STEPS) - carbon and methane offsets	Pilot - launched January 2000	Demand for carbon offsets will come from Shell's business units that are capped and fail to achieve target reductions in carbon emissions.	Business units through energy efficiency, ending continuous flaring of gas, expanding the group's forestry business and helping customers to switch to less carbon-intensive sources of energy.	Internal trading.
Carbon allowances within BP Amoco	Pilot Sept 1998 - Dec 1999; full trading from Jan 2000	Business units that exceed company imposed carbon emission cap must purchase credits from other business units or outside the company.	Business Units that out-perform carbon emission cap can sell extra permits to other business units. External emission reductions, e.g. through investments in reforestation, allowed.	Internal trading.
Suncor Energy - GHG credits	Pilot - from end 2000	Suncor Energy's oil sands operation, northern Alberta.	Business units within Suncor. Offsets through energy efficiency improvements. External projects, e.g. reforestation and forest conservation, are currently not counted.	Internal trading.
The Greenhouse Emission Management Consortium (GEMCo)	Pilot	10 Canadian power companies, which purchased at least 2.8 million tC.	IGF Insurance, a crop insurer in the US, through its agreements with farmers in Iowa aimed at reducing tilling of soil, increasing tree planting, generating power from biomass and using methane from livestock waste.	Pooled transaction & private broker - the trade was negotiated by Cantor Fitzgerald Environmental Brokerage services.
Ontario Power Generation	Pilot	Ontario Power set a voluntary target of stabilising annual GHG emissions at 1990 levels from 2000.	Carbon offsets have been sought internally through improved energy efficiency and carbon sequestration, and externally	Intermediary-based and pooling.
Civil Aviation Organisation - carbon emission controls	Proposal	Aircraft that exceed emission caps.	Aircraft that undershoot emission caps.	Unclear.
Partnership for Climate Action - a consortium approach	Emerging	Seven carbon emitters: BP Amoco, Shell, Alcan, Dupont, Ontario Power Generation, Pechiney, Suncor Energy have set carbon reduction targets totaling 80 million tC by 2010.	From within the group of emitters as well as through CDM projects.	Over-the-counter transactions of credits.

Initiative	Market status	Market demand	Market supply	Mechanism
JOINT	Launched May 2000	JOINT is a consortium of European private companies that have committed Euro 1.7 m to invest in JI projects.	Projects from central and eastern Europe, focusing on the electricity and combined heat and power sectors.	Pooled transaction.

Regional Initiatives

Initiative	Market status	Market demand	Market supply	Mechanism
Start-up CDM in Africa	Proposed in May 2000	Ultimately private companies, NGOs and governments are expected to purchase carbon offsets.	A range of CDM projects in Africa, with an emphasis on energy and power generation sectors.	Variety from direct negotiations to clearing-house transactions.
EU emission trading scheme - carbon credits	Proposed for 2005	Large point source emitters that exceed caps.	Large point-source emitters that undershoot caps. Sinks will also be credited and CDM projects allowed.	Over-the-counter and exchange based - internet-based simulations have involved trading of carbon permits through spot and futures markets provided by ParisBourse.

International Agency schemes

Initiative	Market status	Market demand	Market supply	Mechanism
World Bank Prototype Carbon Fund	Pilot in November 1999	Raised \$135 million by end March 2000, including investment by 15 companies and six governments.	Carbon offset projects in developing and transitional countries. Investments are likely to focus on renewable energy.	Pooling mechanism and investment fund. The Prototype Carbon Fund acts as an intermediary fund.
IFC's Renewable Energy and Energy Efficiency Fund - carbon credits	Pilot in June 2000	Investors include private utilities, environmental investment companies, life assurance companies, and donors.	Carbon credits generated from renewable energy projects in developing countries.	Financial intermediary and pooling - REEF channels equity finance to carbon-friendly investments in developing countries.

Case studies for watershed protection markets

Country	Project/ commodity	Market status	Demand	Supply	Mechanism
Australia (New South Wales)	Macquarie River Basin - transpiration credits	Pilot - initiated in 1999	600 farmers in the Macquarie River Basin, cooperating through the Macquarie River Food and Fibre Group	Transpiration credits supplied through tree planting in 100 ha of private land, organised by State Forests New South Wales.	Government intermediary & pooled transaction.
Australia (New South Wales)	Salinity credit trading	Proposed, & pilot in Liverpool Plains	Demand is regulatory driven, and will come from dischargers and land developers that require salinity offsets.	Salinity credits provided through: the protection of native vegetation; tree planting to reduce groundwater recharge; increased water use efficiency; engineering solutions; and use of salt affected lands. Supply will come from private landowners or the Government forest service.	Clearing-house and auctions - funds will be channeled through an Environmental Services Investment Fund which will offer a pooling mechanism for buyers and allocate funds to most effective sources of supply through an auction system.
Australia (New South Wales)	Salinity-friendly products	Proposed	General public living in New South Wales and elsewhere, who are concerned about rising salinity levels.	Investment in landscape and other salinity control measures by private landowners who receive certification.	Retail-based market.
Bolivia, Argentina	Bermejo River - watershed protection contracts	Proposal	Twelve private dam owners on the Bermejo River, which benefit from water for hydroelectricity, irrigation, recreation, fishing, fees, etc.	The Tariquia Reserve, Baritu National Park and Sama Reserves protect 36% of the Bermejo Watershed. They are composed mostly of cloud forest.	Fund intermediary and user fees/pooled transaction - a fixed user fee will be channeled through an independent fund to compensate upstream landowners.
Brazil (Sao Paulo)	SEMAE - watershed restoration contract	Pilot - initiated in 1998	Water utility (SEMAE) in the Piracicava River Basin agreed to pay 1% of its annual revenues from the municipality. SEMAE raised funds for this payment through a charge of R\$0.01 per m ³ water.	Forest restoration along riverbanks in the Corumbatai watershed.	Government intermediary & user charge - funds channeled through the Municipal Environment Council.
Chile	Water share trading and payments for watershed protection	Proposal	All water users, most notably farmers who rely on irrigation, companies and water users' associations.	It is proposed that revenue from water users goes to watershed management.	Over-the-counter and brokers - water shares are issued to applicants by the Director General for Water. A tariff system is implemented to ensure cost recovery of water supply systems. It is proposed that watershed protection costs are incorporated into this tariff.
China (Guangdong Province)	Watershed protection contracts	Emerging	Water supply and hydroelectricity enterprises.	Forest protection by local households in key tributaries of the Bei River, Qujiang County.	
China (Hebei Province)	Miyun Reservoir	Emerging	Beijing and Tianjin water supply authorities. Beijing has agreed to pay 1	Forest protection and land management in Hebei Province which feeds Beijing's	Fund & internal market - environmental compensation fund to channel

Country	Project/commodity	Market status	Demand	Supply	Mechanism
	restoration and maintenance scheme		million Yuan/year and Tianjin 400 thousand Yuan/year.	Miyun Reservoir.	payments to Hebei Province.
China (Jiangxi Province)	Xingguo County - watershed protection contracts	Emerging	Serious soil erosion affects 84.78% of Xingguo County, an area of 190,000 ha. To finance its payments for watershed protection, the County collects mandatory payments by local industries.	As 96% of the forestlands in the area have been contracted to individual households, who are responsible for delivering watershed protection.	User fees/over-the-counter transaction
China (Northwest)	Mini-watershed restoration schemes	Emerging	Local government authorities	Subsidised leases to small farmers or enterprises in the watershed to restore the damaged mini-watershed.	Over-the-counter - standard land contracts to restore critical watershed areas.
China (Shiangxi Province)	Yao County watershed protection contracts	Emerging	Yao County water supply authorities impose additional levy on water users to pay for watershed protection	Funds channeled to the Forestry Department to protect the watershed.	User fee & internal market
Colombia	Valle del Cauca - land acquisition and land management contracts	Emerging	Downstream farmers, initially in the Guabas River watershed. Payments made through user charges per litre of water received.	Watershed management activities include: soil stabilisation through re-vegetation and fencing to prevent grazing in vulnerable areas.	Community intermediary, pooled transaction user fees/over-the-counter. The Guabas River Water User Association is responsible for collecting fees, managing funds and allocating payments.
Colombia	National watershed management contracts	Emerging - since 1991	Mandatory payment by electricity generators, waterworks, water using industries, agriculture, etc..	Reforestation and restoration of secondary forests in critical watersheds.	Government intermediaries - the Regional Autonomous Corporations.
Colombia	Compoalegre Users Association - land acquisition	Proposal	Farming community that relies on the Quebrada El Chocho river for its water.	Reforestation and protection of upstream land.	Community intermediary & pooled transaction - an Association of Users for the river.
Costa Rica	Heredia Public Service Enterprise - national park protection	Proposal	Heredia Public Services Enterprise and the National Water and Sewers Company on behalf of the City of Heredia.	Forests are protected in critical areas of the upper watershed of Heredia by private landowners and the Barba Volcano and the Braulio Carrillo National Parks.	Private sector intermediary & user fees/over-the-counter - water utilities will act as intermediaries collecting payments from water users through an additional levy on water users.
Costa Rica	Energía Global	Emerging since 1997	Energía Global is paying \$10/ha/yr to maintain water quality for its 2 run-of-the-	Landowners in watersheds that feed the generators through reforestation,	Government & NGO intermediaries, pooled transaction and over-the-

Country	Project/ commodity	Market status	Demand	Supply	Mechanism
	payments, Central Plateau		river electricity generators.	sustainable forest management and protection.	counter contracts – the National Fund for Forestry (FONAFIFO) collects payments from Energia Global, and allocates it to landowners via a local NGO FUNDECOR.
Costa Rica	River Platanar, San Carlos	Agreement accepted in 1999	The hydropower company Matamoros has agreed to pay US\$15/ha over 5 years.	Landowners living in the high and upper-middle parts of River Plantanar through forest protection and reforestation.	Government & NGO intermediaries, pooled transaction and over-the-counter contracts
Costa Rica	Monte Verde Cloud Forests	Emerging - signed on October 1998	La Manguera, a hydropower plant, pays for forest protection.	Protection of cloud forest by the Monte Verde Conservation League, an NGO.	Government intermediary & pooled transaction.
Costa Rica	San Jose watershed fund	Emerging	Residential and industrial water users	Watershed protection measures, e.g. restoration of riparian buffers, planting in groundwater infiltration zones and forest protection by landowners.	NGO intermediary & pooled transaction - local watershed management fund.
Ecuador	Water Conservation Fund in Quito	Emerging - pilot initiated in 1998	Water users in Quito and surrounding areas, including: water utilities; farmers; hydropower companies; industrial; tourist operators; and domestic users.	Investment in watershed protection in the Cayambe-Coca (400,000 ha) and Antisana Ecological Reserves (120,000 ha). Locals paid to adopt improved land management practices.	Trust intermediary & user fees/pooled transaction - payments will be channeled through an independent Water Conservation Fund (FONAG).
Ecuador	Cuenca City - land acquisition & watershed protection	Mature - set up in 1984	Since 1984 Cuenca City has invested more than US\$2 million in the conservation of the watershed.	Protection of upper part of the watershed achieved by government and NGOs.	User fees and community-based intermediary.
El Salvador	El Imposible National Park - protected area contract	Pilot	Water users in two boroughs of the San Francisco Menéndez Municipality.	Protection of the El Imposible National Park.	User fees & pooled transaction.
Guatemala	Montagua River, Sierras las Minas	Proposed	Residents in Guatemala City, downstream farmers and hydropower companies.	Biosphere Reserve in Sierras las Minas.	Government intermediary & pooled transaction/user fees.
India (Gulbarga, Karnataka)	MYRADA - land management contracts	Emerging	Funds come from farmers who contribute both in cash and in kind.	Self-help groups implement watershed development by contracting local farmers to regenerate and maintain fallow land in upland areas.	Community intermediaries & pooled transaction - payments through self-help groups who pay either directly (contracts) or indirectly through cheap loans.

Country	Project/ commodity	Market status	Demand	Supply	Mechanism
India (Himachel Pradesh)	Inter-state watershed protection contract	Pilot & proposal	The central Government on behalf of downstream states in north west India.	Afforestation and watershed management by Himachel Pradesh which covers catchments for five major rivers.	Direct in-kind payments & internal market - payments are currently made in the form of free electricity, investment in dam construction and afforestation. Himachel is pressing for the introduction of a "water cess".
India (Rajasthan)	Water harvesting in the Arvari catchment - reduce siltation and water table regulation	Mature - initiated in the 1980s	Villagers in the Bhaonta-Kolyala villages of the Arvari catchment	Increased water supplies achieved through the construction of new water storage facilities and forest regeneration on upstream degraded slopes.	Community intermediary - the payment system is managed by a village assembly, and a Gram Kosh (village fund) keeps cash.
India (Sukhomajri)	Tradable water rights system and user fees	Emerging	Demand for erosion control (and sustainable water supplies) comes from downstream farmers. Water users pay a fee per hour of water use.	Soil and water conservation measures in upstream common areas. Restricted grazing and management of forest resources through a hill resource management society.	Community intermediaries & user fees/pooled transaction - charges for watershed protection attached to water use. A water users association was established to manage the funds from charges, and a Hill Resources Management Society to implement watershed protection.
Indonesia	Sumber Jaya Lampung - land management contracts	Nascent/pilot	Way Besai Dam	Small holder coffee farmers adopting watershed-friendly production techniques	NGO & government intermediaries - the deal is facilitated by ICRAF and the local forestry office.
Indonesia (West Lombok)	Payments for improved water quality	Proposal	Water supply company threatened by increasing upstream deforestation.	Villagers in Bantek village through improved land management, including forestry	NGO intermediary - the Institute for Economic and Social Research, Education and Information (LP3ES) organises villagers and negotiates on their behalf.
Jamaica	Watershed protection contracts & fees	Proposal	Water users who depend on surface and groundwater recharge.	The Forest Department working with local forest management committees to protect critical watershed forests.	Trust fund intermediary & water user fees – funds from a levy added to an annual licencefee would be channeled through a new forest management and conservation fund.
Malawi	Escom - watershed protection contracts	Pilot	Malawi's national electricity supplier, Escom, wants to raise water quality to avoid siltation in dams feeding hydroelectricity generating plants in	Local NGOs and government agencies (e.g. Forestry Department, Wildlife Society of Malawi, the National Parks and Wildlife Department) working with	Government/NGO intermediary.- Payments are made to intermediary organisations (e.g. Forestry Department, Wildlife Society of Malawi,

Country	Project/ commodity	Market status	Demand	Supply	Mechanism
			Nkhula, Tedzani, Kapichirain.	local communities to improve forest management.	the National Parks and Wildlife Department).
Malawi	Water boards - watershed protection contracts	Pilot	Two major water boards (Lilongwe and Blantyre) and one regional water board (Northern Region).	Local NGOs and the government's Forestry Department working with local communities to improve forest management in watersheds.	Government/NGO intermediary - Payments are made to intermediary organisations (e.g. Forestry Department, Wildlife Society of Malawi, the National Parks and Wildlife Department).
Malawi	Water boards - protected area contracts	Proposed	Five water boards as customers for the Forestry Department's watershed protection services.	Forest protection in key watershed areas, including: Zomba Plantation; Dzalanyama Forest Reserve; Kaning'ina Forest Reserve; Kongwe Forest Reserve; and the Dzonzi-Mvai Forest Reserve.	Fund intermediary, user fee & internal market - a levy will be imposed by the Forestry Department and revenue fed into a Forest Management and Development Fund.
Pakistan	Mangla Dam - watershed protection contracts	Emerging - initiated in the early 1980s	Project initiated by the Water and Power Development Authority in Pakistan	Watershed protection measures by farmers around the Mangla Dam, Pakistan's second largest dam.	Direct negotiation - payments have been in the form of technical assistance and other inputs.
Panama	Darien: Committee for saving the Filo del Tallo hills	Proposed - being piloted	The Committee for saving the Filo del Tallo hills was established by downstream villagers to negotiate with upstream landowners.	Protection, conservation and restoration of natural resources in the Filo del Tallo Hydrological Reserve. The project covers private lands and involves 500 families.	User fees and NGO intermediary.
Panama	Chagres watershed payments scheme	Proposed	Canal owners and Panama city residents	Forest protection in Chagres watershed.	Undecided.
Philippines	Makiling Forest Reserve - protected area contracts	Proposed - pilot in Mindanao	Domestic users, farmers, commercial enterprises, research organisations, government power companies, inland fisheries and aquaculture producers. Charges paid by a subset.	Implementation of a 5-year Makiling Forest Reserve Conservation and Development Programme. Peoples' Organisations are likely to play a role in organising farmers soil and water conservation measures.	Trust fund intermediary & user fee - a watershed protection and conservation fee added to existing water charges. The revenue generated would be channeled through a new trust fund.
Philippines	National Power Corporation Watershed rehabilitation fee	Proposal 2001	National Power Corporation	Watershed rehabilitation in upper reaches of watershed around hydropower facilities	User fee - funding sourced from electricity users through a Watershed rehabilitation fee added to electricity rates.
Romania	Paying for improved	Proposed in 1999	Water consumers ranging from households, to farmers to industry.	Various basin management activities undertaken by the Department of Water	User fees and over-the-counter transactions - the 11 basin branches of

Country	Project/commodity	Market status	Demand	Supply	Mechanism
	water quality			through Apele Romane, its operational arm. Reforestation is key.	Apele Romane collect charges and fees and are responsible for river basin management.
South Africa	Stream flow reduction licences (SFRL)	Nascent - issued in 2000. No trading has yet occurred.	SFRL will be issued to all land managers who reduce stream flow. To date only the forest industry has been regulated.	If licences are tradable, supply would come from land managers who clear exotic plantations.	Over-the-counter - Licences are issued to forestry operators up to a cap and will include an annual catchment management charge.
USA	Ecolotree - soil contaminant removal	Emerging	Landowners and polluters, including wastewater treatment plants, landfill sites, fertilizer manufacturing plants, Superfund chemical fill sites, etc.	Ecolotree, a private company offers soil contaminant control services through poplar planting and vegetative systems (legumes and grasses) that filter and absorb contaminated water from the soil.	Over-the-counter - Ecolotree offers its services through direct contracts with purchasers.
USA (Colorado)	Boulder Creek Riparian Enhancement Project	Emerging since 1990	By 1996, the City of Boulder contributed US\$1.4 million, to reduce phosphorus, un-ionised ammonia, reduced water temperatures, and an improved aquatic habitat.	Riparian Enhancement involving: stream bank stabilisation, riparian restoration, development of pool habitat, narrowing/deepening the channel, restoring wetlands habitat, fencing off livestock, etc.	Unclear.
USA (Connecticut)	Long Island Sound sediment compensation fund	Proposed	Downstream inhabitants who value local marine life and who have to dredge accumulating sediment	Upstream inhabitants through adoption of agreed best land management practices.	Pooled transaction & fund - a special Long Island Sound sediment compensation fund.
USA (Idaho)	Lower Boise River Effluent Trading System - Reduction Credit Certificates	Pilot initiated in January 1998	Point source polluters regulated under the National Pollution Discharge Elimination System are likely the main source of demand.	Supply of water quality credits may come from nonpoint source polluters that adopt approved land management practices, including buffer strips and filter strips. Credits are valid for sale if they have been transformed into "Reduction Credit Certificates".	Clearing-house intermediary - a multi-stakeholder association, the "Idaho Clean Water Cooperative", oversees trading. The Cooperative is responsible for: receiving and registering nonpoint source certificates; maintaining a trade database; brokering trades; preparing monthly trade summaries. All trades will be audited and will be subject to on-site verification. Effluent trading ratios ensure that trading does not result in lower water quality.
USA (Maine)	Portland Water District water quality	Mature - Plant Grant Programme was introduced in	Portland Water District on behalf of local residents (160,000 people).	Residents around Lake Sebago through tree planting and re-vegetation. Supply is also ensured through land acquisition by the Portland Water District.	Government intermediary and over-the-counter: (1) The Portland Water District has set up a Plant Grant Programme which offers lakeshore owners \$200 in matching grants to

Country	Project/ commodity	Market status	Demand	Supply	Mechanism
	scheme - land acquisition and planting contracts	1995			plant approved vegetation; (2) Land acquisition within 1,000 feet of the lake.
USA (Minnesota)	Rahr Malting Company - pollution reduction credits worth 1 lb CBOD/day equivalent.	Nascent/pilot - trade agreed in 1997	Rahr Malting Company based on a requirement by the Minnesota Pollution Control Agency in 1998 to offset its planned increase in Carbonaceous Biochemical Oxygen Demand pollution from a new wastewater treatment plant on the Minnesota River. In total Rahr paid \$250,000 for pollution credits five years.	Nonpoint source credits achieved through approved land management activities by local farmers in the Minnesota River Basin, including: soil erosion control, livestock exclusion, critical set asides, and wetland treatment systems. Rahr is also undertaking tree planting in critical flood plain areas. As of February 2000, it is estimated that Rahr's credits exceeded its pollution by 30%.	Trust fund & clearing-house intermediaries – funds channeled through a trust fund to the Minnesota Pollution Control Agency, which contracts farmers. Pollutants are converted into equivalent "trading units" and trading ratios are used to take account of location and activity. A discount factor is introduced to account for added risks of nonpoint source pollution reduction.
USA (Minnesota)	Cannon River Watershed Partnership - land manageme nt contracts	Mature	The Cannon River Watershed Partnership, a not-for-profit private company that provides funds to private landowners through its Cooperative Assistance Programme	Habitat restoration along the Cannon River in order to improve water quality. Small and medium landowners are targeted (5-20 acres). Activities include buffer strip restoration, rotational grazing and forestry.	Direct payments - incentives are provided in the form of cost-sharing and technical assistance.
USA (mostly in Maine)	Leases for forested aquatic environme nts	Mature	Fishing and recreation companies and environmental NGOs	International Paper Company set aside 25,000 acres.	Direct negotiation & pooled transaction - payments are made directly by purchasers to the International Paper Company.
USA (New York)	NYC Watershed Programme - land acquisition, conservatio n easements, forest and land manageme nt contracts	Emerging - initiated in the mid 1990s	NYC on behalf of domestic consumers of drinking water. About 8 m NYC inhabitants and 1 m inhabitants of surrounding areas consume about 1.4 b gallons of water a year. To improve water quality the city is willing to pay \$1.4 billion over ten years. This will be passed on to consumers through increased water rates.	A range of land-based solutions are being implemented in the Catskill/Delaware catchment, which supplies 90% of drinking water, and the Croton catchment that supplies 10%. Since forests account for 75% of the area, improved forest management is key. Supply is generated through land acquisition, conservation easements and payments for improved land management.	NGO intermediaries - several intermediaries to act as brokers for emerging deals. With regard to forests, the key broker is the Watershed Forestry Programme, which channels financial (e.g. cost-share) and in-kind (e.g. training, education, technical assistance, free inputs) support to forest owners.
USA (North Carolina)	Tar-Pamlico Basin -	Emerging	Nutrient dischargers are required to achieve pollution targets, and permitted	Farmers are contracted to generate credits by reducing nonpoint source	Government clearing-house and over- the-counter transaction. Purchases of

Country	Project/commodity	Market status	Demand	Supply	Mechanism
	nutrient pollution credits		to offset excessive emissions through the purchase of credits. Municipal and industrial dischargers formed the Tar-Pamlico Basin Association (TPBA) to purchase credits (measured in terms of nitrogen and phosphorus loadings) from nonpoint source polluters. By 1994, 14 discharges were members of the Association, accounting for about 90% of all point source flows to the River.	pollution through improved agriculture land management, e.g. riparian buffers, water control structures, and nutrient management. By 1998, \$750,000 worth of nonpoint source credits were sold.	nonpoint source credits are channeled through the North Carolina Agriculture Cost Share Program. A trading ratio of 3:1 is used to convert nonpoint source nutrient reductions to downstream nutrient loadings. Initial payments of \$56/kg/yr for non-point source credits fell to \$29/kg/yr in 1996.
USA (Oregon)	Salem Public Works Department - land management contract	Mature	The Salem Public Works Department is concerned with maintaining water quality, and controlling sediment loading in water.	The watershed area is mostly owned by the US Forest Service. The USFS will provide higher quality water through improved forest management.	Direct negotiation & internal market.
USA (Oregon)	Model watersheds programme - land management contracts	Pilot/nascent - in 1993	Government of Oregon funds a salmon restoration programme costing US\$30 million. The timber industry has agreed to contribute US\$13 m to this programme.	Civil society organisations in partnership with local landowners who restore salmon habitat. Forests are an important part of this habitat providing cover to cool the water, food and pools for spawning and juvenile development.	NGO intermediaries - the Government sponsored programme is implemented through not-for-profit agencies that work in partnership with landowners to restore salmon habitat.
USA (Oregon)	Little Butte Creek - salmon habitat restoration contract	Emerging since 1993	Little Butte Creek Watershed Council is representative of a diverse range of interests, including: timber, agriculture, sports fishers, recreation entities, small businesses, the city of Eagle Point. The Council receives state finance and contributions from the Rogue Flyfishers, Trout Unlimited and others to improve the river habitat.	Aquatic habitat improvements have been achieved through a range of activities, including tree planting along stream-banks and the purchase of water rights from upstream farmers.	NGO intermediary - Little Butte Creek Watershed Council represents those demanding improvements in aquatic habitat and initiates deals with riparian landowners to achieve improvements. More recently the Council has purchased upstream water rights.
USA (Oregon)	The Deschutes Basin Land Trust - land and water rights acquisition	Pilot/nascent	Hydropower company	Restoration of 145 acre floodplain meadow by The Deschutes Basin Land Trust	NGO intermediary - the Deschutes Basin Land Trust received payment by hydropower company for restoration of 145 acre floodplain meadow. The Trust keeps the water rights for in-stream use and maintenance of aquatic productivity.
USA (Pacific Northwest)	Salmon Safe certified	Mature	Concerned consumers through purchases of certified agricultural produce. Salmon-Safe products are sold	Salmon-sensitive land management by farmers, including reforestation in areas vulnerable to erosion. By 1999, over	Retail-based payments - the Pacific Rivers Council issues Salmon Safe Certificates to farmers that adopt

Country	Project/commodity	Market status	Demand	Supply	Mechanism
	agricultural produce		in Fred Meyers shops in Washington, Alaska, Montana, Idaho and Utah.	10,000 acres were independently certified in 40 farms.	required land management practices. Producers use a Salmon-Safe logo to attract consumers who demand improved aquatic habitat.
USA (Pacific Northwest)	Salmon habitat credits	Proposed	Demand would be generated through government requirements that landowners in salmon habitats protect certain forested areas, e.g. riparian buffers. Areas would be zoned according to value as salmon habitats. In less sensitive zones, landowners would be permitted to develop habitat as long as they offset this area by purchasing credits in more valuable habitat zones.	Supply of credits from landowners that exceed salmon habitat requirements in their zone.	Over-the-counter & clearing-house - trading of salmon habitat credits between zones that are less valuable as salmon habitat ("sending areas") and zones that are more valuable as salmon habitat ("receiving areas"). A clearing-house system would lower transaction costs.
USA (Pennsylvania)	Chester Water Authority – Land management contracts	Mature	Chester Water Authority on behalf of local residents: 200,000 people. A range of other NGOs (e.g. Ducks Unlimited), private foundations (e.g. Penn Foundation, Chesapeake Bay Foundation) and other Government agencies (e.g. Conservation Commission, Fish and Boat Commission) have expressed demand.	Landholders in the Octoraro watershed through improved land management (e.g. forested riparian buffers, fencing stream banks, barnyard management).	NGO intermediary - the landowners in the Octoraro watershed are represented by the Octoraro Watershed Association, a not-for-profit agency. The Association was established in the 1970s to bridge gaps between those who benefit from watershed protection and those living in the watershed. In-kind incentives include: technical assistance, training and education. Financial incentives have also been offered through the OWA.
USA (Utah)	Salt Lake City Corporation - land acquisition & conservation easements	Emerging since 1980s	Salt Lake City Utilities seeking to implement its watershed management plan (1988) to maintain water quality for 4000,000 local residents.	Watershed landowners willing to sell land and/or conservation easements to the City Utilities. Currently about 75% forested. By 1999, 1000 acres were purchased for \$1.154 m, and in 1998 US\$500,000/yr available.	Direct negotiation & fund intermediary - payments are made via a Public Utilities Water Rights and Watershed Purchase Fund established in 1989. Finance for land acquisition and conservation easements is generated by a fee of \$0.50 fee on every monthly water bill.
USA (Washington)	Seattle Public Utilities water quality improvement	Mature	Seattle Public Utilities to ensure high quality drinking water.	Improved land management through a Habitat Conservation Plan involving the establishment of an ecological reserve in 64% area and improved forest management outside the reserve.	Direct negotiation – the Seattle Public Utilities purchased 99.9% of Cedar River watershed from the US Forest Service, and 70% of South Fork Tolt Watershed from the Weyerhaeuser Company.

Country	Project/ commodity	Market status	Demand	Supply	Mechanism
	t scheme - land acquisition				
USA (Wisconsin)	Rock River Basin - Phosphorus credits	Piloting - Workplan finalised in Sept 2000	Point polluters: municipal and industrial wastewater treatment facilities regulated under the state's water quality permit system. A pilot investigation identified ten treatment facilities (eight municipal, two industrial) that are interested on trading soon.	Supply of credits from both point and nonpoint source polluters. Nonpoint source pollution accounts for 59% of the total phosphorus pollution and that improved agricultural practices could reduce this by 40%. The State is developing a list of approved land practices, e.g. wetland restoration or planting riparian buffers.	Government intermediary/broker, over- the-counter or clearing-house - piloted trades are heading towards deals brokered by local Land Conservation Departments. Trading ratios for replacing point source reductions with nonpoint source reductions range between of 1:1.75 to 1:2.25.
Vietnam	Government watershed managemen t contracts	Emerging - initiated in 1995	The government pays through its Programme 556 on behalf of downstream beneficiaries. Currently maximum payments of US\$3.34/hectare/year are made in protection and special use forests.	Supply by households and individuals through forest protection, restoration and planting in protected and special use forest lands. By late 1996 6 million ha of forest land had been allocated, the bulk of that by State Forest Enterprises for protection.	Government intermediaries - payments are made to households and individuals by the Government through State Forest Enterprises, communes and districts. Participation is voluntary and requires the negotiation of protection contracts and the establishment of Forest Protection Units which are used to transfer funds and monitor implementation. State intermediaries keep a management fee for allocating funds to households.
Zimbabwe	Integrated Catchment Managemen t in Dryland Areas - watershed protection contracts	Proposed	Demand from water users that share a canal for irrigating sugar estates. Apart from two irrigated sugar estates (Mkwesine and Hippo Valley), key user groups include community water users, private farms, small-scale growers in Chipiwa, cattle ranchers, wildlife conservancies, urban users in Chiredzi town and a downstream National Park.	Watershed protection would be provided in the upper reaches of the Runde Basin (Chiredzi sub-catchment) and the Save Basin (Turwi/Mkwesine sub-catchment) in south-eastern Zimbabwe.	Community intermediaries & fund - negotiations between water users and upstream landowners would be undertaken through new Sub- Catchment Councils that provide a central forum for cooperation and would be supported by elected Water User Boards. A Catchment Development Fund would be established to transfer funds for watershed protection activities upstream.

Case studies for landscape beauty markets

	Project/ commodity	Market status	Market demand	Market supply	Mechanism
Australia	Photographic permits in Queensland	Mature	Producers of films, advertisements, professional photographs seeking scenic backdrops.	Queensland Parks and Wildlife Service offers a number of beautiful spots for filming including rainforest landscapes with waterfalls, lakes and wildlife.	User fee/over-the-counter transactions - fees are fixed according to the number of people involved and the equipment used. The more of both, the higher the fee, to offset greater expected environmental damage and to capture higher willingness to pay.
Belize	Toledo Ecotourism Association - package holiday	Emerging - launched in 1990	Tourists interested in a rainforest experience.	The Toledo Ecotourism Association includes ten local Mopan, Kekchi Maya and Garifuna rainforest settlements. The Association offers a range of services including guided walks, stays in community guesthouses, handicrafts, musical performances, crafts lessons, forest canopy walk. Provision of services rotate through the community to share benefits.	Community ecotourism enterprise & fund - 20% of revenue is channeled into a central fund to cover management costs (55%), marketing (15%), community conservation (10%) and development (10%) activities. Each village has an elected executive that oversees ecotourism activities.
Belize	Belize Audubon Society - protected area ecotourism & entrance permits	Mature	Foreign and local tourists. In 2000, about 30,000 tourists, of whom 13% were local residents, visited the five protected areas,	The Belize Audubon Society invests in the upkeep of seven protected areas, covering 60,700 ha. Five permit tourism and four are forest based, Apart from one private reserve, these are Government protected areas and are managed by society. Local communities participate in management through advisory committees.	Entrance fees/over-the-counter - entrance and user fees comprise 15% of annual revenue. The Belize Audubon Society is required to channel 20% of the revenue to the Protected Area Conservation Fund, 70% for park management and development and 10% for infrastructure and security.
Canada	Parks Canada increasing self-financing - access rights	New visitor use fee system in 1994	Domestic and foreign tourists wishing to enter the parks, and tour companies seeking to operate within national parks. In 1999/2000, 16.3 million visitors entered the parks.	Parks Canada is responsible for managing the 38 national parks and reserves, covering 22.2 million ha, with an additional 7.4 million ha withdrawn for future park establishment. Nine national parks are World Heritage Sites.	Entrance fees/over-the-counter and direct negotiation - In 1994 a visitor fee system was introduced permitting Parks Canada to keep revenues from the national parks system, to cover operational and maintenance costs. Fees are set to reflect demand and supply conditions.
China	Jade Peak Gorge - private park & access permits	Emerging since 1980s	Domestic and foreign tourists that visit the park pay fees to use park amenities.	Ten Million Cash Holdings, a private company, obtained a park management contract from Sichuan Tourism Bureau for 100 ha of forestland in Ya'an prefecture, western Sichuan. The area is split into 2 zones: one for a zoo and the	Retail-based mechanism – payments for landscape beauty are embedded in access fees: \$2.40/head per elevator journey. In 2000, the operator earned \$3 m after tax profits.

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
				other for nature tourism.	
Costa Rica	National protected areas - access rights	Emerging - in the 1990s entrance fees increased towards market rates	Domestic and foreign tourists, and tour operators, keen to explore Costa Rica's forests. In 1999 Costa Rica received about 1.03 million international visitors - most of whom spent some time in protected areas.	Currently protected areas cover about 25% of the land area (630,000 ha) organised within nine regional conservation areas, managed under the Ministry of Natural Resources, Energy and Mines.	Entrance fees/over-the-counter and direct negotiation - in 1996 entrance fees were set at \$1/residents and \$6/foreigners. User fees and concessions are also negotiated with tour operators. 75% of fees are kept by the local park to cover operational expenditure and 25% is pooled with other funds to support other parks.
Costa Rica	Hotel contributions to National Parks System - management contracts	Emerging	Tourists staying at the Meliá Hotels in Costa Rica.	Environmental protection programmes in the Tempisque Conservation Area, Guanacaste.	Retail-based payment, private company and trust fund intermediaries - Costarrisol S.A, managers of 4 Meliá hotels, collects voluntary \$1 contributions from clients on their final bill. The funds are passed to a National Parks Foundation, a trust fund, which invests in environmental protection.
Costa Rica	Rafting companies payment for river bank conservation - management contracts	Proposal	Rafting companies (e.g. Rios Tropicales) promoting tours in areas of singular landscape beauty	Private owners of forested land located alongside rivers used by rafting companies for their tours.	Government intermediary - rafting companies negotiating to pay an annual fee to private landowners to protect stream-bank forests. Payments would be channeled via FONAFIFO, the National Forest Fund.
Costa Rica	Biological corridors for Titi Monkeys - management contracts	Proposal	Hotels and other tourist business located in Quepos and Manuel Antonio, who depend on the maintenance of landscape beauty to attract ecotourists.	Private landowners located in areas critical for the construction/maintenance of biological corridors for the Titi Monkeys.	NGO intermediary - Private business pay landowners via a new NGO, ASCOMOTI. Initial funds of over \$70,000 have been agreed.
Costa Rica	Monteverde Cloud Forest Reserve - access rights	Emerging	Individual tourists from Costa Rica and abroad. Approximately 50,000 tourists a year visit Monteverde Cloud Forest Reserve	Monteverde Cloud Forest Reserve is a private reserve, covering over 50,000 ha. The Tropical Science Center manages the Reserve.	Entrance fees/over-the-counter - The Reserve implements a multi-tier fee system with foreigners paying \$23/head and residents only \$2/head. In 1994, the Reserve generated \$850,000, 90% of which covered operating costs and 10% went to the Tropical Science Center.
Costa Rica	Talamanca - package holiday	Emerging since 1990	National and international tourists interested in learning about wildlife and indigenous culture in the Talamanca mountains.	Local residents of Talamanca, grouped under the Talamanca Association of Ecotourism and Conservation (ATEC) concerned by the threats of conventional tourist development to the area.	Clearing-house mechanism & vertical integration - ATEC serves as a clearing-house putting visitors in contact with local naturalist guides. ATEC offers different types of tour packages,

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
					including hikes, visits to different indigenous reserves, visits to indigenous community forests.
Ecuador	Tropic Ecological Adventures - access rights and management agreements	Mature	Tropic Ecological Adventures, a private company, contributes to environmental protection in areas that it operates.	Communities protect forests in and around the Amazon. Communities that receive funds from Tropic include the Cofan of Zabalo, the Huaorani, the Siecoya and the Sacha Runa.	Direct access payments & NGO-intermediary - Tropic sells ecotourism holidays run by local communities, and commits to donating at least 10% of profits to environmental protection in Ecuador. Funds are donated through its not-for-profit agency, Acción Amazonia, which in turn invests in a number of environmental NGOs/community groups.
Ecuador	Cofan Ecotourism project - access rights and package holiday	Pilot - initiated in 1995	Foreigners interested in local ecology and culture and Transturi Tourist Company, which bought equity in community-based operation. One tourist group of between six and twelve people is received every month.	The Cofans in Zabalo offer a range of forest activities in the Cuyabeno Wildlife Reserve in Ecuador's Amazon, including forest trekking, cultural tours, canoeing, etc.	Joint venture, direct payments and fund intermediary - ten Cofan families in Zabalo formed a joint venture with the Transturi Tourist Company in Quito ("Aguarico Trekking") to offer tourist trips. Transturi invested US\$15,000 to establish facilities and committed to marketing the site. The community operates the site. Community shareholders receive 50% of the profits. Access fees are channeled into a community fund.
Ecuador	Transturi's Flotel in Cuyabeno Wildlife Reserve - access rights	Emerging - letter of agreement signed in 1994. Set back in 1995 due to Ecuador-Peru border conflict	Transturi, a major tour operator in the area, serving foreign tourists wishing to explore Ecuador's Amazon.	The Quichuas migrated to the Reserve in the 1980s and formed two settlements: one in the Playas de Cuyabeno and one at Zancudo near the Peruvian border. Zancudo is more remote and includes ten families that subsist on slash and burn agriculture, hunting and fishing. Transturi located its Flotel near the Zancudo.	Direct negotiation - Transturi signed a Letter of Agreement with the Zancudo people in 1994. The Zancudo committed to providing exclusive access to Transturi, to refraining from hunting around the Flotel, and to protecting the area from encroachment. In return, Transturi offered employment, regular deliveries of food, medical services, river and air transport, and a range of education support services.
Ecuador	Sionas, Cuyabeno Wildlife Reserve - tourism services	Emerging through 1990s	Depending on the seasons, between 14-20 agencies operate around the Cuyabeno lakes. These tour operators depend on the maintenance of local landscape beauty.	The Sionas living in Puerto Bolivar are strategically located near the Cuyabeno lakes. The Sionas, dominated by two families, offer motor canoe, guides and other labour services to the various tour operators.	Direct negotiation - increasingly the Sionas sell a pre-packaged set of tourism services. The income they receive from tourism aligns their interests with local tour operators.
Ecuador	Maquipucuna	Emerging	International tourists and scientists. In	Maquipucuna Reserve (45 km NW of	Entrance fees/over-the-counter -

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
	Reserve - ecotourism access rights		1995 the number of visitors was approximately 1,000/year, but was expected to rise to 5,000 during the first full operating year and then stabilise at 10,000.	Quito), which comprises 4,500 ha of primary cloud forest and is surrounded by a private buffer zone of 14,000 ha. The reserve belongs to the Maquipucuna Foundation, an NGO, and is located next to the Choco Bioregion, which is one of ten "biodiversity hotspots" in the world.	payments for landscape beauty are made in the form of entrance fees of \$5 (foreigners) and \$2 (nationals). Lodge fees are \$45 (foreigners) and \$26 (nationals).
Ecuador	FUNEDESIN - land purchase & management agreements	Emerging - ecotourism lodge built in 1995	FUNEDESIN, an NGO, seeks to support rainforest conservation through the development of ecotourism business.	Forests in Modana community land on the Upper Napo river.	Project-based & land acquisition - FUNEDESIN established an ecotourism lodge (Yachana Lodge) in 1995 on Modana community land. Profits from the Lodge are channeled to local development and conservation projects. FUNEDESIN is also raising funds from external sources to purchase threatened forests near the Lodge.
Ecuador	Kapawi Ecolodge and Reserve - leasing forest land & management agreement	Emerging - the land lease was negotiated in 1995	Canodros Company which wished to set up an isolated ecolodge in the Ecuadorian Amazon	The site for the lodge is located on the Achuar indigenous community's land in eastern Ecuador, near the Peruvian border. The area, which lies in the Amazon, is rich in wildlife and harbours 52 Achuar communities	Direct negotiation - to establish the Lodge on community land, Canodros agreed to: a \$600,000 rental payment for the 15 year lease rights. The payment would be made to the Organisation of Ecuadorian Achuar Nationalities; a \$10/tourist fee would be collected and paid to the Achuars over the 15 years of the contract. Total revenue is expected to reach about \$150,00; and in 2011, the Lodge would be "given" to the Achuar communities
Fiji	Koyoyanitu ecotourism initiative - package holiday	Pilot - initiated in 1992	Tourists interested in short breaks in the forests are being sought from urban areas on the island.	Koyoyanitu forests protected by local villagers that are part of a joint community ecotourism scheme, brought together through a Koroyanitu Development Trust which is responsible for managing the area and promoting ecotourism. Villagers invest in maintaining the forests and protecting them from fires and logging.	Community enterprise/vertical integration - communities are brought together through a complex joint enterprise, involving shareholdings by all those contributing land, labour and capital. Local village cooperatives hold shares in Fijian Vanau Tours Inc. through their joint Koroyanitu Development Trust. This company in turn holds 50% shares of a publicly quoted company Fijian Vanua Tours Company Ltd.
Guatemala	Community tourism in Alta	Emerging - initiated in	Tourists interested in a different type of experience. During the pilot year	Mayan families living in communities surrounding the Quetzal's cloud forest in	NGO intermediary & community enterprise- The low-impact tourist project

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
	Verapaz Cloud Forest - package holiday	1997	(1997), 68 tourist visited the community, in 1998 the number rose to 181.	the mountains of Alta Verapaz. The project started with the Chicacnab village and was extended to San Lucas Village.	was initiated by an NGO, Project Eco-Quetzal. The ultimate objective is to form a community enterprise.
Guatemala	Birdwatching - access rights in private lands	Pilot since 1998	Aventuras Naturales, a tour operator based in Guatemala, serving ecotourists interested in birdwatching and trekking. On average, Aventuras Naturales receive 600 clients per year, some 150 for bird watching.	Bird-watching spots, many of them located in private lands. Private landowners allow ecotourism to take place in their lands, and local indigenous people participate by providing tourist services.	Direct negotiation - Aventuras Naturales promotes conservation among landowners and develops programmes for local indigenous groups, while promoting ecotourism in international markets.
India	Ecotourism Sikkim - access rights	Mature - ecotourism market well developed	Tour operators pay for access to landscape beauty in area & invest in technical assistance to help local communities develop their own ecotourism services.	Payments collected by local leaders, Pippens, who invest in protection of Lachung.	Direct payments - payments by tour operators to local leaders and investment in training of local communities in, e.g. trek guides, cooks, porters, etc.
India	Paying for landscape beauty in Sikkim - management agreements	Mature - project initiated in 1995	The Travel Agents Association of Sikkim.	The focus of work is in West Sikkim, the site of a major trekking route and severe deforestation. A range of conservation activities, including trail clean-ups, tree planting, fuelwood substitution.	NGO intermediary - the Sikkim Himalayan Integrated Environment Protection Society was formed by the president of travel Agents Association of Sikkim to support conservation. Support is worth about 5% of gross profits and is provided through specific projects and technical assistance.
Indonesia	Tourism licences/ concessions in protected areas	Emerging - launched in 1994	Accommodation, food, beverage and tourist companies	The Ministry of Forestry issues licences for up to 10% of the utilisation zones in parks for up to 30 years. The licences are issued in consultation with the Minister of Tourism and the Governor.	Direct negotiation - licences are allocated to applicants in return for charges for the initial licence and linked to business profits. The government also collects entrance fees from licenceholders.
Indonesia	Gunung Halimun National Park (Java) - ecotourism package	Mature – Park established in 1992.	Indonesian, expatriate and foreign tourists are targeted, with an emphasis on residents and visitors to Jakarta. Start-up funds for ecotourism development came from a Consortium including Gunung Halimun National Park, Biological Science Club, the Ministry of Forestry, McDonalds, Wildlife Preservation Trust International and the University of Indonesia.	Gunung Halimun National Park was established by the Government, but protection involves local communities.	Bundled services, community enterprise & community fund intermediary - a share of revenue from ecotourism collected, e.g. through guest houses, is channeled back to local communities through community development and conservation funds. The Gunung Halimun National Park Consortium is promoting ecotourism to generate incentives for biodiversity protection.
Kenya	Mwaluganje Community Wildlife	Pilot - community sanctuary	Foreign and domestic tourists keen to experience wildlife and their habitats in Africa.	The Mwaluganje Community Wildlife Reserve Ltd. draws together private landowners between the Mwaluganje	Community enterprise development/vertical integration - the company represents an effort to ensure

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
	Reserve Ltd. - access to landscape beauty & wildlife	opened in 1995		Forest to the north and the Shimba hills to the south. The area creates a wildlife corridor.	local people capitalise on local landscape beauty and wildlife. Local landowners received shares in the enterprise for each acre they committed to conservation. Profits are allocated to shareholders on an annual basis.
Kenya	Ilngwesi Co. Ltd. - access to landscape beauty and wildlife	Pilot - formed in 1995	Foreign and domestic tourists keen to experience wildlife and their habitats in Africa.	The Ilngwesi Co. Ltd. was formed by members of the Ngwesi Group Ranch which lies between the Lewa Conservancy and Mukogodo Hills, including savannah, forests and wetlands. The ranch has 600 members and covers 8,600 ha. To add value to this experience, the group built a lodge.	Community enterprise development/vertical integration - the company helps to ensure local people capitalise on the landscape beauty and wildlife they conserve. The lodge is expected to generate US\$50,000/ year. Decisions on expenditure is taken through majority voting of ranch members.
Mexico	Community recreational park near Mexico City - package tours	Emerging - launched in 1997	National and international tourists	The recreational park is managed by the <i>ejido</i> community of san Nicolas Totolapan.	NGO intermediary & community enterprise - the project was started by Balam Consultores and later transferred to local residents and owners of the <i>ejido</i> .
Mexico	Community ecotourism in Oaxaca - package tours	Emerging	Visitors interested in ecotourism owned and managed by indigenous communities.	Oaxacan native communities located around the river basins near Bahias de Huatulpo. The project involves the creation of bungalows for ecotourism activities. It will expand to include reserves for native flora and fauna, with the possibility of areas for larger mammals, and the development of capacity to supply fruits and vegetables to local hotels.	Community enterprise/vertical integration and trust fund intermediary - the project was promoted by the Centre for Ecological Support, an NGO. The Centre help establish trust funds to allocate finance to local communities. Some tourist operators have agreed to directl their clients to these facilities.
Namibia	Lianshulu Lodge, Mudumu National Park, Caprivi Region - access rights & management agreements	Pilot in 1990	Lianshulu Lodge, a luxury lodge, is owned by three partners, including Botswanan and Namibian investors. It is interested in ensuring positive community relationships and community support for wildlife protection.	There are five communities, including about 750 households, living adjacent to the Park which is characterised by a mix of mopane woodland, open grassland and mixed savanna.	Direct negotiation - bednight levies (which raised N\$26,000 between 1993 and 1995), employment (at full capacity, the lodge hires 40 staff), health checks, environmental education, etc. are all forms of payments to land stewards.
Nepal	Annapurna Conservation Area - access	Mature - initiated in 1986	Annapurna is a popular trekking destination. In 1997, over 50,000 international trekkers visited the area.	The King Mahendra Trust for Nature Conservation got a Conservation Area established in 1992. Local communities	Entrance fees/over-the-counter & trust fund intermediary - revenue from tourists and donations is channeled to an

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
	rights & management agreements		Foreign visitors pay \$20/head. Donations by WWF for biodiversity. In 1996 over \$400,000 had been collected and the WWF had committed to donating an additional \$1.3 m over ten years.	work with the King Mahendra Trust to protect local landscape beauty and biodiversity.	endowment fund managed by the King Mahendra Trust for Nature Conservation. Funds are allocated to local communities through project-based activities.
Nepal	Ghalekharka-Sikles area, southern Annapurna - package of ecotourism services	Emerging - initiated in 1992	Foreign trekkers. Approximately 1,000 visitors passing through the Ghalekharka-Sikles area every year.	Local community natural resource management in the Ghalekharka-Sikles area, southern Annapurna. Activities include forest protection, afforestation, tree nursery establishment, environmental education, etc. The community has also invested as a group in ecotourism facilities, e.g. campsites, lodges, etc.	Community enterprises/vertical integration & fund intermediary. Payments for landscape beauty are embedded in payments for tourism services, e.g. campsite use, lodge stays. Revenue is channeled into a central community fund to be allocated to: the Conservation and Development Committee (15%); the repair and maintenance of tourism facilities (35%); and to community development (50%).
Nepal	Royal Chitwan National Park - buffer zone ecotourism services	Mature - initiated in 1995	Tourists that wish to experience beautiful landscapes and view wildlife.	The Royal Chitwan National Park, a World Heritage site, has been threatened by local encroachment. The King Mahendra Trust for Nature Conservation, with support from the Biodiversity Conservation Network, has helped develop ecotourism in buffer areas. Local community groups invest in forest protection and regeneration, and offer wildlife viewing towers and elephant treks.	Community enterprises/vertical integration. To visit the buffer area tourists must pay entrance fees to the Royal Chitwan National Park, and since 1996 30-50% of the revenue from the Park must go to local communities. Revenue is channeled to the Baghmara Users Committee. This money is then redistributed to the community and towards conservation activities.
Nepal	Lodge tax in Langtang National Park - management projects	Mature	Lodge operators in Syabrubensi village through a Partnership for Quality Tourism Project. The project is managed by a lodge management committee, which agreed that a charge of two Nepali Rupees would be imposed per trekker per night.	Community protection of Langtang National Park, which covers over 170,000 ha and includes some of the best preserved silver fir/rhododendron forests in Nepal.	Fund intermediary - the Lodge Management Committee "pays" local communities to conserve valuable tourist areas through local development projects. Payments made into a central fund managed by a Lodge Management Committee, which allocates money to appropriate community development projects.
Nepal	Muir's Tours - natural resource management projects	Emerging - Muir's Tours has been operating since 1999	Muir's Tours commits to investing in conservation and development in countries in which it operates. It raises funds for its Nepal conservation efforts from ecotourism operations.	Local communities that protect landscapes through careful natural resource management. In Nepal, Muir's is co-financing one project in Panglang village near the Tibetan border. In 2000,	NGO intermediary & project based - Muir Tours will channel 100% of its profits to conservation and development goals. Funds are channeled via the Nepal Kingdom Foundation, a UK

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
				over 10,000 trees were planted to reverse significant deforestation.	charity. To date projects have been undertaken in collaboration with other NGOs, including the Mountain Institute.
Nepal	National Park payments for landscape beauty - access rights	Emerging - amendment in 1993	National Parks through revenue sharing with local people in buffer zones.	Local communities living in buffer zones protection of landscape beauty valued by tourists.	Over-the-counter/entrance fees & fund intermediary - Fourth Amendment (1993) to the National Park and Wildlife Conservation Act 2029 includes a new regulation requiring 30-50% of national park entrance fees and other park revenue to return to local people living in buffer zones.
New Zealand	Ecotourism concessions	Mature	Tourist companies wishing to market landscape beauty to national and international tourists	Department of Conservation manages all national parks, reserves and conservation areas. The Department is not permitted to charge for entry into these areas, but issues concessions to a range of users including tourism companies in return for payment. In 2001, about 1,200 ecotourism concessions had been issued, not all of which are in forests.	Tender/auction and bilateral negotiation - there are two mechanisms for selling ecotourism concessions: (1) Fees may be set through a process of negotiation with the applicant; (2) Concessions may be auctioned in the open market. For operations with little capital investment, fees may reach 7.5% of gross annual income.
Peru	Private ecotourism concessions	Mature - since 1970s	Private ecotourism companies demand concessions. These companies serve foreign tourists that visit Peru's natural zones. In 1999, over 640,000 tourists visited Protected Natural Zones.	Concessions supplied by the Government in critical forest areas outside official protected areas, e.g. in Madre de Dios Department, Southern Amazon.	Direct negotiation - payments are made by ecotourism companies for concessions in protected areas. Forest management is supervised by the forest service.
Peru	Posada Amazonas - joint ecotourism venture in the Amazon - tour package	Emerging - initiated in 1996, customers from 1998	Rainforest Expeditions keen on providing their clients with forest landscapes, bird-life and experiencing a unique culture of the <i>Ese Eja</i> indigenous community.	Infierno community of 80 families, including members of the <i>Ese Eja</i> indigenous group. The community holds legal title to 9,600 ha on both sides of the Tambopata river and agreed to provide a site for lodge construction and access to their land for tours.	Joint venture - the Infierno community entered into a joint venture with Rainforest Expeditions to build and co-manage a new lodge (Posada Amazonas). Management is split between the two partners. Infierno receives 60% of profits for land, labour, and material inputs and Rainforest Expeditions will hand over control and assets to the community by 2014.
Peru	Peru Verde's joint ecotourism ventures - package tour	Emerging	Peru Verde, and its southern affiliate, Selva Sur (Southern Rainforest). Peru Verde was established in 1995 to promote environmental conservation in Peru.	Local communities in south-eastern Peru's Manu and Tambopata regions who commit to forest conservation and providing access to traditional lands.	Joint venture - Peru Verde has set up four lodges in the Amazon (Manu Wildlife Centre, Pantiacolla Lodge, Cock-of-the-Rock Lodge and Sandoval Lake Lodge) that are joint ventures with local communities who own 50% of

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
					shares. All profits are channeled to conservation.
Philippines	Protected areas access rights	Pilots since 2001	Foreign and domestic nature-based tourism.	Protected areas.	Entrance fees/over-the-counter. Under the National Integrated Protected Areas System (NIPAS) Act of 1992, entrance fees are to reflect demand and supply conditions. Guidelines for implementing this law were issued in 2000 by the Department of Environment and Natural Resources.
Philippines	Makiling Forest Reserve - access rights	Emerging - new fees in 1998	Local and foreign tourists, students from the University of the Philippines Los Banos. Estimated willingness to pay is above existing fees in 1998.	Makiling Forest Reserve. Currently access is focused on the Makiling Botanical Gardens (300 ha forests). There are plans to introduce new access points through investments in its ECOPARK project. Investment in a range of value-added services include rock climbing, bird watching, peak tours, nature trails, etc.	Over-the-counter/entrance fees & trust fund intermediary - entrance fees were doubled in 1998. Funds from the entrance fees will be channeled through a new Trust Fund that is overseen by a multi-stakeholder Board. Financial management will be contracted out to an independent body, the University of the Philippines Los Banos Foundation, Inc.
Rwanda	National Park - access rights	Mature - introduced in 1980s	Foreign tourists wishing to experience Rwanda's unique landscape beauty and, in particular, its associated wildlife, most notably the mountain gorillas.	Rwanda's National Park office collects entrance fees.	Over-the-counter/entrance fees - the Nyungwe Forest Reserve alone earned US\$15,000/year in the early 1990s, more than its operating costs. The Parc National des Volcans, where the last remaining mountain gorillas are found, charge \$250/tourist for access.
South Africa	Access rights and ecotourism activities in Kwa-Zulu Natal	Mature	National and international tourists interested in experiencing landscape beauty and wildlife. Between 1986 and 1998, visitor numbers to game and nature reserves in South Africa increased by 108% a year.	The Kwa-Zulu Natal Nature Conservation Service manages all protected areas in the province and provides access to these for ecotourism activities. 45 protected areas offer overnight accommodation.	Over-the-counter/entrance fees & retail-based payments - fees for entry are set at a low R9/head/day. To capture willingness to pay for landscape beauty, the Service charges for overnight accommodation, food and drinks, trails, tours, concessions, etc. In 1999 a total profit of R21.3 million was made.
Thailand	Kanchanaburi Ecotourism Cooperative Company - ecotourism services	Emerging - launched in 1995	Foreign and domestic tourists from Bangkok.	The Kanchanaburi Ecotourism Cooperative Company was set up to maximise revenue from ecotourism. The Company has rights to operate in six national parks, most of which are forested, and is planning a range of services, e.g. nature trails, rafting trips, jungle camping, bird watching, mountain	Community enterprise - local communities and private entities can purchase shares in Kanchanaburi Ecotourism Cooperative Company. The company earns profits from commissions and royalties from certain services. Shareholders receive regular dividend payments based on these

Country	Project/ commodity	Market status	Market demand	Market supply	Mechanism
				biking.	profits.
Uganda	Budongo Forest Ecotourism Project - package tourism & access rights	Emerging - project initiated in 1993	Tourists, both domestic and foreign, interested in experiencing tropical forest landscapes and associated plants and wildlife.	The Budongo Reserve covers 82,500 ha, including the third highest level of biodiversity in Uganda. Ecotourism services are being offered by local communities in two sites: Kaniyo Pabidi and Busingiro.	Community enterprise/vertical integration & over-the-counter/entrance fees - The project seeks to ensure land stewards are suppliers of ecotourism facilities, and are directly rewarded for conservation. A community development fund is used to channel 40% entry and camping fees to community activities, e.g. school building. The remaining 60% of revenue covers maintenance costs.
Uganda	Kyambura Game Reserve – conservation agreements	Emerging – initiated in the 1990s	South African tour operator awarded lease by the Game Department (now the Ugandan Wildlife Authority)	Local community in and around Kyambura Game Reserve, which lies adjacent to the Queen Elizabeth National Park.	Direct negotiation – the tour operator pays land stewards in cash and in-kind (e.g. social development projects) in return for conservation efforts. Supported by the Wildlife Club of Katerere, a local conservation NGO.
USA	Recreational Fee Demonstration Program – access rights and concessions	Pilot – launched in 1996 in 100 parks.	Domestic and foreign tourists interested in nature-based recreation as well as tour companies and service providers wishing to operate in federal parks	100 federally managed parks around the country participating in the programme of offering access to natural beauty based on entrance and user fee payments.	Entrance fees/over-the-counter and direct negotiations – the Recreational Fee Demonstration Program aims to allow national parks to retain 80% of their revenue. Revenue is generated primarily through entrance fees and concessions awarded through “competitive selection”.

Private sector initiatives

Initiative	Market Status	Market Demand	Market Supply	Mechanism
Abercrombie & Kent - landscape beauty conservation agreements	Emerging - launched in 1998	Abercrombie and Kent ecotourism company launched conservation scheme in 1998	Conservation projects in a number of countries. Supply is often organised through local communities and NGOs.	NGO intermediaries & project based – an Abercrombie & Kent Global Foundation established in 1998 to support natural resource conservation through local and international NGOs and communities.

Initiative	Market Status	Market Demand	Market Supply	Mechanism
Conservation Corporation Africa - rural development and conservation projects	Emerging - Foundation was launched in 1999	CCAfrica wishing to increase environmental conservation in Africa. CCAfrica donates R1.2 million a year.	Local communities undertake rural development and conservation projects in six countries (South Africa, Botswana, Namibia, Zimbabwe, Kenya, Tanzania) in four main areas: 1) Basic needs and regional infrastructure; 2) Capacity building and small business development; 3) Environmental awareness; 4) Sports and cultural development.	NGO intermediary & project based - CCAfrica set up the Africa Foundation in 1999 to channel funds from ecotourism business to local communities. The Foundation builds on an earlier Phinda Community Development Trust (1992) and a Rural Investment Fund Trust (1994). In addition, CCAfrica is entering into cooperative benefit-sharing arrangements in some areas, e.g. Tanzania.

Case studies for bundled environmental services

	Environmental service	Project/commodity	Market status	Market demand	Market supply	Mechanism
Australia (New South Wales)	Water table regulation, biodiversity conservation, carbon sequestration	Environmental service trading NSW: salinity credits, biodiversity credits and carbon offsets	Proposed	Several potential customers for different credits are highlighted: salinity credits interest the State Government, dischargers that require salinity offsets, downstream irrigators/water users directly affected by increased salinity. Biodiversity credits interest environmental groups and private philanthropists. Carbon credits interest carbon emitters required to offset their excess emissions.	All environmental commodities would be supplied through reforestation and forest protection activities in areas high in biodiversity, valuable for water table regulation and that meet carbon sequestration requirements.	Clearing-house and auctions - funds will be channeled through an Environmental Services Investment Fund which will offer a pooling mechanism for buyers and allocate funds to most effective sources of supply through an auction system. Funds for biodiversity and carbon could be channeled through a conservation trust to top up salinity payments.
Australia (New South Wales)	Carbon sequestration, water table regulation, biodiversity conservation	Hancock New Forests Australia - carbon, biodiversity, and salinity credits	Pilot from July 2001	A range of companies and institutional investors are being targeted to invest in this private company - Hancock New Forests Australia Pty. Ltd. While most investors will want financial returns, the company is offering to pay investors in the form of carbon credits, biodiversity credits and salinity credits.	Environmental credits will be supplied by independent forest service providers alongside timber production. Supplies will be certified and comply with relevant regulations, e.g. the Kyoto Protocol and State laws relating to carbon offsets. The aim is to maintain a portfolio of native reforestation projects of varying age classes to deliver the desired environmental services and timber.	Investment fund intermediary - private investors will invest in Hancock New Forests Australia, which in turn maintains a portfolio of forest investments to deliver carbon, salinity, biodiversity and timber yields.
Belize	Landscape beauty and biodiversity	Belize Audubon Society - protected area ecotourism & entrance fees	Mature	Foreign and local tourists. In 2000, about 30,000 tourists visited the 5 protected areas, 13% of whom were local residents. International and local NGOs interested in biodiversity protection.	The Audubon Society invests in the upkeep of seven protected areas, covering 60,700 ha. Five permit tourism and 4 are forest based. Apart from the private reserve, the remainder is government owned, managed by the Audubon Society under contract. Local communities are	Entrance fees/over-the-counter - entrance and user fees (e.g. for camp sites) comprise 15% of annual revenue, equivalent to US\$206,000. The Audubon Society also receives grants from conservation NGOs and donors (62%), membership dues (3%), special events (3%), profits from

Country	Environmental service	Project/ commodity	Market status	Market demand	Market supply	Mechanism
					involved in management through the Advisory Committees.	sales (2%), interest (2%).
Belize	Carbon sequestration and biodiversity protection	Rio Bravo Conservation project	Pilot - 1994	The Nature Conservancy, Winrock International and six US energy companies (Wisconsin Electrical Power Company, Detroit Edison Corporation, Cinergy, Pacificorps, Suncor and Utilitree Carbon Company) are the investors. The Nature Conservancy and Winrock International are interested in biodiversity, the US energy companies are keen to purchase carbon offsets.	The project is expected to sequester 2.4 mtC over 40 years, and protect biodiversity through the conservation of 59,720 ha of mixed lowlands, moist subtropical broadleaf forests in NW Belize. The area will be managed by the Programme for Belize.	NGO intermediary, trust fund & pooled transaction - funds are channeled through a local NGO, Programme for Belize. Funds are channeled to landowners through: 1) land acquisition; and 2) direct payments for forest management. An endowment fund has been established to ensure long term financing. Carbon sales were sought as an innovative financing mechanism for protecting biodiversity.
Bolivia	Biodiversity protection, carbon sequestration	Noel Kempff Climate Action Project (NKCAP)	Pilot	NKCAP involved a financial transfer of US\$9.6 million, US\$7 million of which came from three private energy companies (American Electric Power (AEP) Systems (USA), Pacificorp (USA) and BP America (UK)), US\$2.6 million from The Nature Conservancy and the local conservation group Fundación Amigos de la Naturaleza. In return, rights to carbon credits are divided as follows: 49% Government of Bolivia, 49% private investors and 2% to AEP for its "pioneering role". Returns from revenues generated from biodiversity business are also paid to investors.	Carbon offsets and biodiversity protection services are generated through the conservation of 634,286 ha of forest from logging, and guarantee its carbon sequestration services. The conserved area includes land purchased from farmers adjacent to the Noel Kempff National Park for about US\$2.5/ha. The area will sequester up to 14 million mtC over 30 years.	Pooled transaction, NGO intermediary & trust fund: The project will be implemented through a local NGO. Payments for offsets are channeled to local landowners in several ways: US\$1.6 million went to compensate loggers for the loss of their logging rights; US\$1.55 million went to set up environmentally-friendly businesses, e.g. eco-tourism; US\$1.5 million went to establish an endowment fund to ensure long term finance; and the rest funded leakage prevention activities, protection of the park and technical assistance.
Brazil	Watershed,	ICMS Ecológico	Emerging	State governments willing	Conservation is the responsibility	Internal market - the ICMS is

Country	Environmental service	Project/ commodity	Market status	Market demand	Market supply	Mechanism
	biodiversity, landscape beauty protection			to pay municipalities for improvements to environmental performance, e.g. maintenance of conservation units and water supplies. In Parana, 1.25% of the revenue from sales tax (ICMS) has been allocated according to ecological criteria since 1992. Rondonia, Sao Paulo, Minas Gerais, Rio Grande Do Sul and Mato Grosso Do Sul have followed suit. Only Parana has introduced a qualitative criterion to allocate higher payments to more valuable conservation.	of municipalities. The categories of protected area used in Minas Gerais include: public (biological reserve, ecological station, park, national forest, indigenous reserve); private/public (environmental protection area, special protection area); and individual or corporate (private reserve, private sustainably managed farming lands). Other states, e.g. Sao Paulo restrict eligibility to state lands.	collected by counties, and submitted to states. States reallocate the revenue to counties according to federal guidelines. 75% of the revenue is allocated to areas where revenue originally generated; 25% is allocated according to states' criteria. Since 1992 certain states introduced ecological criteria for a share of the 25%. Payments are made to municipalities, which may pass payments on to non-governmental suppliers of conservation.
China	All	National Ecological Benefits Compensation Fund - payments for environmental services	Nascent	Government set up scheme under Forest Law (1998). The scheme will involve collection of payments from beneficiaries of environmental services for distribution to providers. Seed funding of about 15 million Yuan was provided in 2001, increasing to 2 billion Yuan in 2002	Individual households through forest management.	Government intermediary - the Forest Ecological Benefits Compensation Fund is managed by the Government and involves the collection of payments from beneficiaries of services and their transfer to providers. In 1992, Wuyuan County of Jiangxi province established the first local-level Fund.
Costa Rica	All	Government Payments for Environmental Services scheme - contracts for forest protection, sustainable management and reforestation	Emerging	The government's National Fund for Forestry Finance (FONAFIFO) pays for the provision of a range of environmental services. Finance comes from central Government (e.g. national fuel tax) as well as service	Costa Rica contains 4% of the world's species and much of this is found in forest areas. In 1997 the scheme paid for reforestation of 6,500 ha, sustainable management in 10,000 ha and protection in 79,000 ha forest. To date, an estimated 22,000 small and medium farmers have	Over-the-counter and NGO intermediaries - payments are made by a Government agency, FONAFIFO, as part of a national payment scheme. All contracts are awarded for 20 years and all sites must be certified. Contracts are attached to the land deeds and when land is sold the new owner

Country	Environmental service	Project/ commodity	Market status	Market demand	Market supply	Mechanism
				beneficiaries (e.g. bioprospectors, carbon emitters, hydropower companies). Since 1995, US\$47 m has been invested.	participated, covering 279,000 ha.	adopts the obligations. In the case of smallholders, NGOs provide intermediary services, e.g. FUNDECOR has organised 371 farmers with 22,000 ha in Arenal.
Costa Rica	Carbon and watershed protection services	Norway purchase of Certified Tradable Offsets, & Costa Rican National Power and Light Company purchase of improved water quality	Pilot - initiated in 1996	Demand for carbon offsets comes from a Norwegian consortium of companies (Eeg-Henriksen Anglegg AS, Kvaerner Energy AS and ABB Kraft AS) and the Norwegian Ministry of Foreign Affairs. The carbon offsets are part of a larger project involving the Costa Rican National Power and Light Company and the Costa Rican Electrical Institute who expect to benefit from the resulting water services. The total project cost comes to \$3.4 million. The carbon costs are set by the Government at \$10/metric tC (\$2.72/tCO ₂).	Supplies of carbon and watershed services are achieved through reforestation, forest conservation and regeneration in 4,000 ha in the Virilla River Basin (outside San Jose) and the establishment of a native tree buffer zone of about 1,000 ha. Individual farmers provide services. The project will supply 230,842 metric tC over 25 years (and will also lead to the displacement of fossil fuels with hydropower energy) as well as improved water quality.	Government intermediaries and over-the-counter - carbon credits are issued by the Government's Office for Joint Implementation to the Norwegian partners. Funds are passed to FONAFIFO which also receives funds from the electricity companies. FONAFIFO channels this income to participating farmers under the Government's Payments for Environmental Services scheme. FONAFIFO pays farmers about \$58/ha/yr for forest conservation and \$48/ha/yr for reforestation.
Costa Rica	Carbon sequestration and biodiversity protection	Biodiversifix (AIJ project)	Pilot	Funding for project implementation from The Nature Conservancy, which is interested in leveraging funds for biodiversity protection. Demand for carbon offsets is expected from private companies responsible for large-scale carbon emissions.	Biodiversity and carbon offsets will be generated through the regeneration and management of degraded land in and near the Guanacaste Conservation Area. Tropical wet forests (13,500 ha) and tropical dry forests (45,000 ha) will be regenerated.	Bilateral negotiation & over-the-counter – The Nature Conservancy is paying for biodiversity protection and is seeking to raise additional funds through the sale of carbon offsets to interested buyers.
Costa Rica	All	BOLPRO (Agricultural stock market) -	Proposed	Demand for trees' environmental services could come from NGOs	The supply of environmental services comes from private landowners who have not	Exchange-based market-BOLPRO, Costa Rica's Agricultural Stock Market, will

Country	Environmental service	Project/ commodity	Market status	Market demand	Market supply	Mechanism
		sales of trees' environmental services		and individuals interested in preserving biodiversity protection, watershed conservation, landscape values or even carbon. Companies may also be interested where purchases are associated with permission to use a logo that may help to boost their sales.	already received payments under the Government's Payments for Environmental Services scheme. Supply must be independently certified, and once the services are sold they become a feature of the property.	serve as the intermediary for sales of rights to environmental services. Property rights will include clearly specified requirements for independent certification. BOLPRO is designing a logo for purchasers to attach to their products. Purchases will be registered with the Government to prevent double counting under the Government's environmental payment scheme.
Ecuador	Biodiversity protection and carbon sequestration	Bilsa Biological Reserve		World Parks Endowment Inc. of the US and future sales to large private sector GHG emitters.	The project will lead to avoided carbon emissions through the conservation of 2,000 ha of tropical forest in the Montanas de Mache in the Esmeraldas province of NW Ecuador, an area classified as one of the world's top three biodiversity hotspots. This area will be added to the Bilsa Biological Reserve and managed by Fundación Jatun Sacha. Currently the area is threatened by conversion to cropland and cattle pasture.	Bilateral negotiation & trust fund - in total the project costs come to \$380,000, including a \$100,000 trust fund established to finance continued forest protection.
India	Biodiversity conservation and landscape beauty	Ecotourism & conservation in Sikkim	Mature - project initiated in 1995	The Travel Agents Association of Sikkim is interested in maintaining landscape beauty on which their business depends. The Mountain Institute, the GB Plant Institute of Himilayan Environment and Development, The Biodiversity Conservation Network, and other international donors are interested in biodiversity conservation. A joint NGO was formed with support	Initially 200 community members in four settlements prepare and implement ecotourism plans that set out a range of conservation activities, including trail clean-ups, tree planting, fuelwood substitution. The focus of work is in West Sikkim, the site of a major trekking route and severe deforestation.	Project based - the projects seeks to promote biodiversity conservation as a basis for preserving landscape beauty for the ecotourism sector. Support is in the form of technical assistance and training.

Country	Environmental service	Project/ commodity	Market status	Market demand	Market supply	Mechanism
				from the tourism trade (the Sikkim Himalayan Integrated Environment Protection Society) to continue conservation support.		
Indonesia	Biodiversity protection and landscape beauty	Gunung Halimun National Park (Java)	Mature	Indonesian, expatriate and foreign tourists are targeted for ecotourism sales. In addition, demand for biodiversity protection from a Gunung Halimun National Park Consortium (including the Biological Science Club, the Ministry of Forestry, McDonalds, Wildlife Preservation Trust International and the University of Indonesia).	Gunung Halimun National Park was established by the Government in 1992.	Community enterprise & community fund intermediary - The Gunung Halimun National Park Consortium contributed to investment in ecotourism facilities to generate incentives for biodiversity protection. Start up costs of US\$448,430 provided by the Biodiversity Conservation Network, a USAID project, in 1995. In addition, a share of revenue from ecotourism collected, e.g. through guest houses, is channeled back to local communities.
Panama	Carbon sequestration, watershed protection, biodiversity conservation, landscape beauty	Sale of environmental services in Darien	Proposal	The Government and the private sector.	Environmental services (scenic beauty, soil and water conservation and carbon fixation) from forest protection sustainable forestry management, forestry plantations and agroforestry in 363,060 ha in the Province of Darien. The Darien National Park, which has been declared a World Heritage site. The National Park will sequester carbon worth \$24.5 million over 25 years.	Over-the-counter contracts for reforestation & sustainable management - Government payments funded through a share of a fuel tax and the issuance of reforestation bonds. These bonds will be distributed among the forestry industry and could be used to cancel any tax. The bonds would be given at the time of establishing the plantation, and could be traded through a stock market.
Paraguay	Carbon sequestration and biodiversity protection	Mbaracayu initiative	Pilot	AES and The Nature Conservancy. AES wished to offset emissions from its 180 MW coal-fired power plant in Oahu, Hawaii. AES receives all the carbon offsets at a cost of	60,000 ha protected reserve to offset 14.5 m tC.	NGO-intermediary – the Nature Conservancy has organised payment.

Country	Environmental service	Project/ commodity	Market status	Market demand	Market supply	Mechanism
				\$2 million (i.e. \$0.14/tC) over the 35-year agreement. The Nature Conservancy is interested in positive spin-offs for biodiversity.		
Philippines	Watershed protection, biodiversity conservation, landscape beauty	Integrated Protected Areas Fund - payments for environmental services	Emerging - introduced in 1992	Demand for environmental services will come from a range of sources, including: donors, individual beneficiaries, regular user fees (e.g. visitor entry fees derived from the operation of the Park); proceeds from leases in multi-use areas (e.g. tourism concessions); taxes on the sale of park produce.	Environmental services are supplied by the National Integrated Protected Areas System. The system is managed by the Department for Environment and Natural Resources.	National Fund intermediary - an Integrated Protected Areas Fund was set up in 1992. Financing for conservation should be shouldered increasingly by beneficiaries of environmental services.
Philippines	Watershed protection and landscape beauty	Makiling Forest Reserve - ecotourism access rights & watershed protection charge	Emerging & proposed - new fees introduced in 1998, watershed fee not yet implemented	Landscape beauty demanded by local and foreign tourists, students from the University of the Philippines Los Banos. Watershed protection to be financed by main users: water districts, water cooperatives, Institutional users (Government research bodies) and resorts and private swimming pool owners.	Landscape beauty is supplied by the Makiling Forest Reserve, with access provided by the Botanical Gardens, which covers 300 ha forests. Watershed protection to be achieved through a five year Makiling Forest Reserve Conservation and Development Programme costing US\$2.6 million. Individual farmers and peoples' organisations may be involved through specific projects.	Over-the-counter/user fees & trust fund intermediary - entrance/user fees were doubled in 1998. It is also proposed that a watershed protection and conservation fee be added to existing water charges. Funds from the fees will be channeled through a new trust fund that is overseen by a multi-stakeholder management board.
Poland	Watershed protection, biodiversity conservation	National Fund for Environmental Protection and Water Management	Mature - established in 1989	The Government, on behalf of its citizens, channels payments to environmental protection through a National Fund established in 1989. Between 1989 and 1994, the National Fund dispersed about US\$500	A range of environmental projects in all sectors.	National Fund & private sector intermediary - the Government's National Fund for Environmental Protection and Water Management is an autonomous agency responsible for channeling revenue to environmental projects. The Fund channels money directly to applicants and through the

Country	Environmental service	Project/ commodity	Market status	Market demand	Market supply	Mechanism
				million. In 1993 the National Fund accounted for about 22% of all environmental expenditure in the country.		Environmental Protection Bank in the form of soft loans.
United Kingdom	Biodiversity protection and landscape beauty	Environmentally sensitive area agreements	Mature	The Government is the buyer of improved forest amenity values and biodiversity protection. Grants are aimed at increasing the forest area, and at improving the environmental value of existing forests. The Woodland Grant Scheme is the largest, paying out over UK£30 million in 1997/8. Grants encourage increased diversity.	Forest planting and improvement is undertaken by private landowners around the country. In 1997/8 alone, the Woodland Grant Scheme led to the creation of 16,000 ha coniferous and broadleaved forests and 4,700 ha native pine. In addition, 5,800 ha were restocked.	Over-the-counter - Government grants are offered at a standard rate for particular activities. In general, grants are paid once certain activities have been completed and verified by the Forestry Authority.
USA (Virginia)	All	Tree rights deposits and The Forest Bank	Pilot/nascent	The Nature Conservancy offers forest owners regular payments in return for owners depositing their tree rights in a Bank.	The Nature Conservancy is targeting non-industrial private forestland and large private landowners interested in ensuring the protection of forest environmental services, but who lack the expertise and resources to do it. Key concerns are that only 5% of non-industrial private forests have a management plan, and that the plots are increasingly fragmented. As of 1 June 2000, one landowner had deposited their land in the Forest Bank and six more were discussing potential deposits. The ten year goal for Clinch Valley is 60,000 acres.	Bank intermediary – The Nature Conservancy has created a Forest Bank that is designed along commercial bank lines, but which accepts deposits in the form of forest land. Depositors receive dividend payments calculated on the basis of the deposited timber value and an option to withdraw cash value of deposit, subject to certain penalties. The Bank finances its dividend payments through sustainable forest management and marketing premium products.
USA	All	Payments for environmental services – Department of Agriculture's	Mature - initiated in 1985	The Department of Agriculture's Commodity Credit Corporation pays landowners to establish long-term, resource-	Private landowners who have owned or operated the land for at least 12 months prior to signing up. Lands are eligible for payments where they are:	Auctions and over-the-counter payments - payments are made in two parts: annual rental payments plus additional lump sums to cover up front costs. Rental agreements

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		Conservation Reserve Program		conserving cover on environmentally sensitive cropland or, in some cases, marginal pasture land. Several environmental services are demanded, including: water quality protection, erosion control, habitat conservation, air quality, etc. Annual payments of up to \$50,000 per year are allowed. In addition payments of up to 50% cost of establishing cover and separate incentive payments for restoring wetlands (up to 25% cost of restoration).	susceptible to erosion; cropped wetlands; devoted to highly beneficial environmental practices; located in a national or state conservation priority area; or enrolled in the Water Bank Program. Lands must be under threat.	are auctioned and the lowest bidder wins, i.e. the landowner that is willing to supply environmental services at the lowest cost. Once agreed, contracts last for 10-15 years. Reserve prices are set for auctions according to competing lands performance against an Environmental Benefit Index.
USA (Virginia)	All	Tradable development rights	Mature	County programme will finance purchases of tradable development rights through a special fund.	Landowners in Virginia State facing development restrictions in selected area under the Mountain Protection Plan.	Direct purchases – the tradable development rights system is based on zoning regulations whereby governments identify conservation and development areas. Landowners in conservation areas are prevented from exercising their development rights, but have the option to sell these to development areas.
USA (New Jersey)	Biodiversity protection, landscape beauty	Tradable pinelands development credits.	Mature - initiated in 1980	Demand for development credits comes from designated growth areas (i.e. Regional Growth Areas (80,000 acres); and Rural Development Areas (132,000 acres)) within and outside the Pinelands National Preserve. A cap on total demand for development rights is set at 46,200 homes.	Supply of tradable development rights comes from designated "sending areas" within the Pinelands National Preserve. These areas have restrictions on their development rights. Sending areas include: Forest Areas (400,000 acres); Preservation Area (295,000 acres); Agricultural Production Area (66,200 acres). Approximately one credit worth four building units was issued for	Bilateral trades & clearing-house – the imposition of a management plan in 1980 categorised land covering 1.1 m acres into levels of environmental sensitivity. The most sensitive areas were designated "sending areas". In these areas development is restricted and landowners were issued with tradable Pineland Development Credits that could be sold to areas designated for growth. While most trade occurs

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					39 acres of agricultural land. By 1995, 12,538 acres of land had been preserved for agriculture and low-impact forestry, following the sale of 1,424 building rights.	through bilateral negotiation, some is channeled through the State Pinelands Development Credit Bank.
USA (Vermont)	All	Conservation easements	Mature	Vermont Land Trust through its Farmland Preservation Programme	Green Mountains conserved in perpetuity through conservation easements agreed with 150 landowners in first ten years. Landowners are not permitted to undertake farming in the areas.	Direct purchase - Vermont Land Trust negotiated with landowners in Green Mountain to purchase conservation easements, a legal contract between the landowner and purchaser of development rights.

Company initiatives

Company	Environmental Service	Project/commodity	Market Status	Market demand	Market supply	Mechanism
Forest Stewardship Council	All	Independently certified timber	Mature	Demand originated in the early 1990s through an alliance of conservation NGOs (e.g. WWF) and retailers wanting to promote sustainable forestry. Buyers groups have been the major sources of demand, more recently being formed under Global Forest and Trade Networks. In Western Europe about 5% of the wood market is certified, and in the US the share is 1%, or about US\$500 m/yr. These shares are growing rapidly.	In 2000, over 18 million ha of forests had received Forest Stewardship Council (FSC) certification, and the World Bank-WWF Alliance have targeted 200 million ha by 2005. The Pan-European Forest Certification scheme covers 18 million ha in Scandinavia alone and expects to cover 27 million ha by the end of 2000. European forests are the dominant source accounting for over 70% of certified area in August 2000.	Retail-based market - buyers demanding certified products are effectively demanding forest products that are produced alongside a range of environmental services. "Payments" for these services come in several forms, e.g.: retained and increased market share; new markets; technical assistance; and (in a few cases) price premium. The market depends on credible certification schemes which provide independent verification that supplies are delivered.
Environmental Synergy, Inc.	Carbon sequestration and biodiversity protection	Sale of carbon offsets & biodiversity benefits	Emerging	Electricity and fossil fuel-based companies interested in carbon credits with biodiversity spin-offs. The oil giant Texaco recently invested in the reforestation of 1,500 acres in the	Environmental Synergy, Inc. arranges supplies of environmental services through reforestation projects involving native forest habitat. The company is based in Georgia, USA and has an office in Austria.	Broker-based trade – Environmental Synergy acts as an intermediary arranging supplies of biodiversity friendly carbon for clients.

				Mississippi River valley, expected to yield 800,000 tCO ₂ over 70 years. The deal cost US\$900,000, or about \$1.13/tCO ₂ . Illinova, an electricity supplier, invested in reforesting 100,000 acres in 1999.		
Sustainable Forestry Management Ltd.	Carbon sequestration, biodiversity protection, landscape beauty	Private investment fund	Emerging - established in 1998, expects to be fully capitalised in 2002	Private investors.	A basic income stream is guaranteed by the commercial timber operation and additional funds earned from associated environmental service sales. In May 2001, SFM Ltd. purchased 48,000 tCO ₂ from Native American Confederated Salish and Kootenai tribes who replanted 100 ha of their Montana reservation. The trade was organised through the Montana Offset Coalition.	Investment fund intermediary & broker-based trades - SFM Ltd. will establish joint ventures with local businesses, e.g. ecotourism operations, and put its own money into acquiring rights to adjacent forest lands and the associated benefits. SFM Ltd may use brokers, e.g. Environmental Financial Products in a carbon deal in Montana, to find suitable opportunities.

Donor initiatives

Donor	Environmental Service	Project/ commodity	Market Status	Market demand	Market supply	Mechanism
GEF	Biodiversity protection and carbon sequestration	SME Programme	Mature	GEF pays for biodiversity protection in developing countries through a range of mechanisms. The SME Programme was set up with US\$16 million of GEF funds to stimulate private small and medium scale enterprises interested in biodiversity conservation and reduction in GHG. To date the SME Programme has agreed 15 loans with financial intermediaries worth US\$11 million.	Local financial intermediaries that invest in small and medium enterprises undertaking acceptable biodiversity and GHG reduction businesses. A significant share of these has been in the forestry sector.	Local NGO or private intermediary - funds are channeled to local biodiversity investors via the International Finance Corporation. Investors may be private entities, e.g. venture capital funds or NGOs. They are selected based on their experience with the SME sector, their financial viability, and their access to environmental expertise. Local intermediaries receive loans from the IFC and grants from the GEF to cover transaction costs of working in the environmental service sector.