FOREST TRENDS

THE KATOOMBA GROUP'S Ecosystem Marketplace

PROFOR

PAYMENTS FOR ECOSYSTEM SERVICES (PES) MARKETS

The PES Matrix Chart

CLASSIFICATION

PES MARKET	COMPLIANT CARBON FORESTRY	VOLUNTARY CARBON FORESTRY	COMPLIANT WATER QUALITY TRADING	VOLUNTARY WATERSHED MANAGEMENT PAYMENTS	GOVERNMENT-MEDIATED WATERSHED PES	COMPLIANT BIODIVERSITY OFFSETS	VOLUNTARY BIODIVERSITY OFFSETS	GOVERNMENT-MEDIATED BIODIVERSITY PES	INDIVIDUAL FISHERIES QUOTAS (ITQs and IFQs)	RECREATION	GENETIC RESOURCES (Access & Benefit Sharing)	LAND CONSERVATION	TRADABLE DEVELOPMENT RIGHTS	CERTIFIED FOREST PRODUCTS	CERTIFIED AGRICULTURAL PRODUCTS
SUB-MARKETS	Kyoto: CDM, JI, NSW, RGGI, CCAR (coming soon at regulatory level)	Chicago Climate Exchange; Retailers; NGO Intiatives (ex. TNC in Bolivia; Carbon Pool, CI, etc.); VERs from pre- CDM projects	Nutrient/Salinity/Temperature trading: Canada, Colorado, Connecticut, Pennsylvania, Minnesota, Ohio, Oregon, Virginia, New South Wales. Australia has numerous programs in development.	Beverage Companies (Vittel, Coca-Cola, Beer companies), Public or Semi-Public Utilities in Costa Rica and Ecuador	China, Colombia, Costa Rica, Mexico, NYC, U.S.D.A. Conservation Programs such as WRP, UNEP/WWF project in Danube	U.S. Compensatory Mitigation (Permittee-responsible, credit banking & in lieu fee) Australia's BioBanking, BushBroker, & others. Canada's Nova Scotia DOT habitat banking EU Habitats & Birds Directives offsets Holland's 'Red for Green' program Brazil's compensation mechanisms Colombia's mitigation programs South Africa, Germany, Switzerland (unconfirmed) IEA offsets in developing countries	Extractive industry offsets, BBOP, Wal-Mart	National Biodiversity Conservation Programs (Mexico, Costa Rica, Brazil, US Farm Bill,Australia, Switzerland, Poland, Slovenia, etc); Government funds for biodiversity conservation (United Kingdom, New Zealand, Kazakhstan, Burkino Faso, etc); Debt for Nature swaps (Bolivia, Costa Rica, etc), Habitat or species specific conservation program (Mexico, Brazil, US Farm Bill, Australia)	New Zealand, US, Canada, Australia, South Africa	Ecotourism, Park fees, Hunting licences (Campfire & CC Africa)	Pharma, biotech	(1) Conservation easements (with and without tradeable tax credits). (2) Outright land purchases	In the U.S., Maryland and New Jersey have developed TDR systems. Internationally, Australia, Brazil and Paraguay have both begun experimenting with Transferable Protection Obligations	Timber and NTFPs (oils, resins, botanicals)	Agricultural products: Organic, fair-trade, Rainforest Alliance and UTZ certified agricultural products
MARKET DRIVER	Cap and Trade/Compliance-Driven Markets	Voluntary; Public relations; Preparing for regulation; Corporate responsibility; individuals taking responsibility	Cap and Trade/ Compliance-Driven	Voluntary Private PES	Government PES	Cap and Trade/Compliance-Driven Markets	Voluntary Private PES	Government PES	Cap and Trade/Compliance-Driven Market	Voluntary Private PES	Voluntary Private PES	Philanthropy; Tax incentives; Government mandate; Profit opportunities for conservation developers	Cap and Trade/Compliance-Driven Market	Certification (consumer preference/procurement driven)	Certification (consumer preference/procurement driven)
ECOSYSTEM SERVICE CATEGORY	Carbon	Carbon	Water	Water	Water	Biodiversity	Biodiversity	Biodiversity	Fisheries Production	Biodiversity	Biodiversity	Bundled	Bundled	Bundled	Bundled

MARKET SIZE

	COMPLIANT CARBON FORESTRY	VOLUNTARY CARBON FORESTRY	COMPLIANT WATER QUALITY TRADING	VOLUNTARY WATERSHED MANAGEMENT PAYMENTS	GOVERNMENT-MEDIATED WATERSHED PES	COMPLIANT BIODIVERSITY OFFSETS	VOLUNTARY BIODIVERSITY OFFSETS	GOVERNMENT-MEDIATED BIODIVERSITY PES	INDIVIDUAL FISHERIES QUOTAS (ITQs and IFQs)	RECREATION	GENETIC RESOURCES (Access & Benefit Sharing)	LAND CONSERVATION	TRADABLE DEVELOPMENT RIGHTS	CERTIFIED FOREST PRODUCTS	CERTIFIED AGRICULTURAL PRODUCTS
CURRENT SIZE OF MARKET (in $ per annum)	New South Wales GHG Abatement Scheme: $558,558; CDM & JI (2006): $0; CCX ~ 359,000 tonnes sold (2006), and ~266,500 tonnes sold (2007)	At least $21 Million in 2006 (LULUCF/ REDD Market)	$15 million	$5 million (many public PES are partially private - like Costa Rica ~30% private funds by electric, also Ecuador, public utility revenues)	$5.2 billion (total) US programs: $1,000 million (New York City ~$150 million, WRP $240 million, EQUIP estimate 50% for water-related ~$500 million) Mexico program: $12 million Costa Rica program: $5 million China program: roughly $4 billion per year	$3.4 billion (total) $3 b - US Wetland & Stream Mitigation $370 m - US Endangered Species Mitigation $2.4m - Victoria's BushBroker $? - Other progams unknown	$10-17 million	$3 billion	Total world ITQ market currently $5-10 billion annually. New Zealand market (only quantified market) was $2.31 billion in mid-1990s; now likely twice that.	$5-10 billion?	$15-30 million	$8 billion in United States. In 2006, state and local bond initiatives approved $6.7 billion in funding for land conservation. The federal Land and Water Conservation Fund (the principal source of funding for land acquisition by federal natural resource agencies) received $346.8 million in 2006. According to the Land Trust Alliance, $1 billion worth of endowments had been established for land trusts in 2005.	TDR programs exist in over 50 state and local jurisdictions in the United States, but according to a 2006 publication - "only 15 programs nationwide have protected more than 100 acres." The biggest program is in Montgomery County Maryland where a 2004 count suggested 38,251 acres had been preserved.	$5,000 million (FSC only)	Total Certified Ag-products Market (global retail sales): US$ 42,000 million (probably underestimated) representing approx. 2.5% of global food and beverages.
POTENTIAL SIZE BY 2010 (in $ per annum)	$10 million- 2 billion	$15 million to 1 billion	over $500 million if 2007 Farm Bill catalyzes real action	$50 million	$3,000 million	$4.5 billion	US$30 million	$4 billion	$ 10 billion		$35 million	$15,000 million		$15,000 million	US$ 97,000 million by 2012 (assuming a growth rate of 15% per year)
POTENTIAL SIZE BY 2020 (in $ per annum)	$5 million- 5 billion	$10 million to 5 billion	$1,000 million	$2,000 million	$6,000 million	$10 billion (more if other countries adpot practice)	$100 million - if corporations take to the concept	$7 billion	$ 25 billion		$100 million	$20,000 million			US$ 210,000 million (assuming a growth rate of 10% per year between 2012 and 2020)
POTENTIAL SIZE BY 2050 (in $ per annum)	$0 - 5 billion	$10 million to 5 billion	$2,000 million	$10,000 million	$20,000 million	$20 billion (more if other countries adpot practice)	$400 million - if corporations take to the concept	$15 billion	$50 billion		> $500 million	This is difficult to predict because acquisitions of land and easements for conservation purposes are largely dependent on public funding and/or tax policies which are vulnerable to change across a 40 yr. horizon.		$50,000 million	US$ 900,000 million (assuming a growth rate of 5% per year between 2020 and 2050)
CURRENT RATE OF GROWTH (annual %)	The regulated forest carbon market did not have significant growth in 2006. However, general carbon market growth was a 221% Increase in EU ETS trading volume between 2005- 2006 (thus far this number does not include any forestry projects); NSW increased 176.8% between 2005 and the third quarter of 2006	General voluntary market growth: The general CCX market trading volume increased by 700% between 2005 and 2006 and grew 100% between 2006 and 2007 ; The broader voluntary market also increased rapidly by an estimated 200% between 2005 and 2006. LULUCF growth: Ratio of credits in volunatry market decreased but volume still continued to increase; The percentage of forestry credits sold on CCX decreased between 2006 and 2007.	0.05	0.1	0.1	0.15	0.03	None	0.1	0.2	0.05	25%. The Land Trust Alliance reports that the pace of conservation by land trusts more than tripled between successive 5-yr periods (1996-2000 vs. 2001-2005)		0.25	Growth during the last years roughly 40% per year for organic and fair-trade products, 10-15% for RA certified products, and 25-40% for UTZ certified products (coffee). Expected medium term annual growth rates: 15-20% for organic and fair-trade, 8-15% for RA certification.

DEVELOPING WORLD IMPACT

	COMPLIANT CARBON FORESTRY	VOLUNTARY CARBON FORESTRY	COMPLIANT WATER QUALITY TRADING	VOLUNTARY WATERSHED MANAGEMENT PAYMENTS	GOVERNMENT-MEDIATED WATERSHED PES	COMPLIANT BIODIVERSITY OFFSETS	VOLUNTARY BIODIVERSITY OFFSETS	GOVERNMENT-MEDIATED BIODIVERSITY PES	INDIVIDUAL FISHERIES QUOTAS (ITQs and IFQs)	RECREATION	GENETIC RESOURCES (Access & Benefit Sharing)	LAND CONSERVATION	TRADABLE DEVELOPMENT RIGHTS	CERTIFIED FOREST PRODUCTS	CERTIFIED AGRICULTURAL PRODUCTS
CURRENT SIZE OF MARKET IN DEVELOPING COUNTRIES (in $ per annum)	Majority of investment in developing countries: Precious Woods earned 512,000 CERs from a biomass energy project (forestry related, not sequestration); Pearl River Basin in Guangxi province, China was the first forestry project to be registered under CDM. It is estimated to produce 400,000 CERs by 2017 and a further 600,000 by 2050.	Probably 70% in developing countries	Size and volume in developing countries unknown; VERY INSIGNIFICANT because legislative infrastructure and real enforcement are required.	Costa Rica ~30% private funds by electric, also Ecuador, public utility revenues. ESPH in Costa Rica operates independent of FONAFIFO and invests roughly $45,000 a year in protecting the watershed.	Mexico program: $12 million; Costa Rica program: $5 million; South Africa program: R660 million per year, $65 million	More information on programs in Brazil, Colombia, and South Africa needed. Unknown how many ecosystem offsets are driven by EIA regulation in developing countries.	$5-8 million (probably 50% of all voluntary biodiversity offset activity is in developing countries)	$190 million	There is no global IFQ market; market size is variable according to the fishery. Data on market size by value are unattainable; most IFQ fisheries indicate size of the market by number of participants (buyers). Almost all the IFQ fisheries are in the developed world (Australia, Canada, Iceland, New Zealand, and the U.S.); South Africa has a nascent ITQ system.	Information unavailable	Most in developing countries	Size and use of easements in developing countries unknown.	Only a few pilot cases (e.g. Brazil and Paraguay)	$120 million	No numbers available. However, the vast majority of certified food products are exported from developing countries.
POTENTIAL SIZE BY 2020 (in $ per annum)	Total Market (CDM): $15 billion	Total Market: $500 million- $ 2 billion, LULUCF Market: $50- 250 million			China program: $US 43 billion across 10 years (program reportely has had difficulties)	Currently unknown, but not likely to take off rapidly consideing substantial legal and enforcement systems required.	$50 million (if international corporations adopt practice)	$500 million				From Inece: "With help from The Nature Conservancy (TNC), the Environmental and Natural Resources Law Center (CEDARENA by its Spanish acronym), first established a conservation easement in Costa Rica eight years ago and now has fostered 60 contracts with private landowners, protecting some 7,000 acres. "Conservation easements," are self-designed legal agreements in which a landowner voluntarily limits development and other activities on his or her property. While conservation easements are still new in the region, they are growing in popularity."			NA
POTENTIAL IN DEVELOPING COUNTRIES	The system takes advantage of the regulatory potential in developed countries to transfer payments to developing countries. Requires change in EU ETS legislation and more acceptance of forest methodolgies	Strong potential for LULUCF in developing countries for voluntary markets	Like all cap-and-trade systems, requires strong legislative/enforcement capacity. Systems have been used in Colombia and elsewhere. Potential is limited in the short-term, but possibly large as government system develop or in the higher-income developing countries	Good potential in developing countries if there is institutional capacity in place and enough science to make the connection between water quality and land use clear. Are seeing some movement on the part of companies like Coca Cola to look into how they support conservation of watersheds in developing countries. The Vittel case study provides insights on the potential for other similar programs, possibly in developing countries.	Tremendous potential in developing countries. Costa Rica, Mexico, Ecuador, China, and South Africa among others have used governments to pay for water-related ecosystem services and with the increased global focus on water quality and cost efficiencies others are likely to follow.	Requires developed legal/enforcement systems; as such may have limited potential in the short-term in developing countries. EIA or voluntary offsets more likely to take hold in early stages.	This system has high potential in developing countries. It is voluntary and therefore does not rely on government legislation. However, it relies on rigorous scientific and social design and requires strong institutional capacity (long term management, monitoring and enforcement) to work.	Particularly rich biodiversity habitat in developing countries and developed countries are taking an increased interest in biodiversity conservation.	Requires strong legal/enforcement mechanims and capabilities. Potential in developing countries is limited in the short-term but may be good in the long-term and devleopment process continues.	Excellent potential in developing countries; particularly those with well-developed tourism infrastructure	Good potential in developing countries. Has been tried before and run into problems. However, with new wave of bio-technology, there may be scope to begin anew.	Countries such as Costa Rica and Brazil are experimenting with easements; however, these are development rights, if they are not enforced their value is limited; requires strong legislative/enforcement mechanisms	Requires strong legal/enforcement mechanims and capabilities. Potential in developing countries is limited in the short-term but may be good in the long-term and devleopment process continues.	In developing countries this is just an extension of timber markets, but may help add value. Good potential	Certified Agroproducts have a good potential to add value to low- and high-value products. Also, in some countries local demand and local markets are developing rapidly. Alliances such as CSPA (see column F) have a good potential to promote local and regional markets for certified Agroproducts.

ENVIRONMENTAL IMPACT

	COMPLIANT CARBON FORESTRY	VOLUNTARY CARBON FORESTRY	COMPLIANT WATER QUALITY TRADING	VOLUNTARY WATERSHED MANAGEMENT PAYMENTS	GOVERNMENT-MEDIATED WATERSHED PES	COMPLIANT BIODIVERSITY OFFSETS	VOLUNTARY BIODIVERSITY OFFSETS	GOVERNMENT-MEDIATED BIODIVERSITY PES	INDIVIDUAL FISHERIES QUOTAS (ITQs and IFQs)	RECREATION	GENETIC RESOURCES (Access & Benefit Sharing)	LAND CONSERVATION	TRADABLE DEVELOPMENT RIGHTS	CERTIFIED FOREST PRODUCTS	CERTIFIED AGRICULTURAL PRODUCTS
ENVIRONMENTAL BENEFIT METRIC	Carbon sequestered (measured in tCo2e)	Climate change mitigated (measured in tCO2e)	Pounds of nutrient pollution avoided, pounds of sedimentation avoided, or in the case of the Willamette - water temperature	Quantity of water improved or protected x degree of protection, potentially = pounds waterborne pollutants avoided	Quantity of water improved or protected x degree of protection, potentially = pounds waterborn pollutants avoided	Area and quality of habitat protected and/or restored	Species, habitats and ecosystems conserved. (Benefit over time will depend on management and monitoring.)	The environmental benefit potential varies so greatly amongst all the submarkets that it is difficult to conclude whether government biodiversity PES programs have a standard impact on environmental conservation, land conservation and forest conservation more particularly	Fish biomass stays or increases to maximum sustainable yield levels; by-catch decreases; fishing mortality is spread over longer time frame than with derby fishing	Species and habitat conserved	Biodiversity level? - royalties usually go in to an environmental trust that invests in a mix of habitat conservation, capacity building, education, etc.	Land area conserved x Ecosystem quality. The Nature Conservancy has developed a science-based system for valuing the environmental benefit of each piece of land protected.		Acres of sustainably managed forests	Avoided agrochemicals pollution, improved water quality, forest and watershed protection, and wildlife and habitat protection.
CURRENT ENVIRONMENTAL BENEFIT (per unit spending) - this is a multiplier, on a scale where 1=low and 5=high)	Low (1)	Medium (2)	Low/Medium (2)	Low/Medium (2)	Low/Medium (2)	Medium (3)	Medium (3)	Medium (3)	Medium (3)	Medium (3)	Medium (3)	Medium (3) The environmental benefits of easements or land acquisitions are considerable when and where they are properly enforced. Critics have raised valid concerns about the financial and legal capacity of land trusts to enforce land protection in perpetuity and scientists have stressed the need for a better accounting of when and where land conservation is occurring through private, voluntary transactions involving easements.		Medium/High (4)	Medium (3)
POTENTIAL ENVIRONMENTAL BENEFIT (per unit spending) - this is a multiplier, on a scale where 1=low and 5=high)	High (4)	High (4)	Medium/High (4)	High (5)	Medium/High (4)	Medium/High (4)	Medium/High (4)	High (5)	Medium/High (4)		Medium/High (4)	High (5)		Medium/High (4)	High (5)
CAN BENEFIT BE MEASURED IN TERMS OF LAND? Yes/No	Yes	Yes	Yes (but may not be that useful)	Yes	Yes	Yes	Yes. (Or marine areas.)	Yes	no		Partial	Yes. The Land Trust Alliance reported that the total number of acres conserved by land trusts in 2005 had risen to 37 million (11.9 million acres in 2005 alone)		Yes	Yes
CONSERVATION VALUE METRIC	Forest (native) area restored and/or protected	Forest (native) area restored and/or protected	Acres of watershed protected, acres of farmland sustainably managed	Acres of land protected or restored	Acres of land protected or restored	Acres of habitat conserved or restored	Proxies for overall biodiversity quality and quantity, usually measured as a combination of habitat quality improvement and area.	Hectares of restored or conservation managed land and protection of specific wildlife habitats; product of species conserved	By-catch reduction is correlated to biodiversity benefit		Acres of high biodiversity	Land area conserved x ecosystem quality. 39% of land trusts report their primary focus is on natural areas and wildlife habitat; 38% say they focus on open space; and 26% say they focus on water resources, especially wetlands.		Acres of sustainably managed forests	Acres of sustainably managed farm lands.
CURRENT LAND CONSERVATION VALUE (per unit spending) - this is a multiplier, on a scale where 1=low and 5=high)	Low (1)	Medium (2)	Low (1)	Medium(3)	Medium(3)	Medium (3)	Medium/Low (3)	Medium/High (4)	N/A		Medium/Low (2)	Medium/High (4)		Medium/High (4)	Medium (3)
POTENTIAL LAND CONSERVATION VALUE (per unit spending) - this is a multiplier, on a scale where 1=low and 5=high)	High (4)	High (4)	Medium (3)	High (5)	Medium/High (4)	Medium (3)	High (5)	High (5)	N/A		Medium/High (4)	High (5)		Medium/High (4)	Medium/High (4)
CURRENT BENEFIT TO NATURAL FOREST (per unit spending) - this is a multiplier, on a scale where 1=low and 5=high)	Low (1)	Medium (2)	Medium/Low (2)	Medium(3)	Medium(3)	Medium/Low (2)	Medium (3)	Medium (3)	N/A			High (5)			Medium (3)
POTENTIAL BENEFIT TO NATURAL FOREST (per unit spending) - this is a multiplier, on a scale where 1=low and 5=high)	High (4)	High (4)	Medium/High (4)	Medium/High (4)	Medium/High (4)	Medium (3)	High (5)	Medium/High (4)	N/A			High (5)			Medium/High (4)
CURRENT BENEFIT TO FOREST UNDER THREAT (per unit spending) - this is a multiplier, on a scale where 1=low and 5=high)	Low (1)	Medium (2)	Low (1)	Medium(3)	Medium(3)	Medium/Low (2)	Medium (3)	Medium/Low (2)	N/A			Medium (3) Securing easements for the most threatened areas is difficult and expensive. Organizations such as Lyme Timber have helped leverage conservation dollars with private sector investment.			Low/Medium (2)
POTENTIAL BENEFIT TO FOREST UNDER THREAT (per unit spending) - this is a multiplier, on a scale where 1=low and 5=high)	High (4)	High (4)	Medium/Low (2)	Medium/High (4)	Medium/High (4)	Medium (3)	High (5)	Medium/High (4)	N/A			High (5)			Medium/High (4)

MARKET PARTICIPANTS

	COMPLIANT CARBON FORESTRY	VOLUNTARY CARBON FORESTRY	COMPLIANT WATER QUALITY TRADING	VOLUNTARY WATERSHED MANAGEMENT PAYMENTS	GOVERNMENT-MEDIATED WATERSHED PES	COMPLIANT BIODIVERSITY OFFSETS	VOLUNTARY BIODIVERSITY OFFSETS	GOVERNMENT-MEDIATED BIODIVERSITY PES	INDIVIDUAL FISHERIES QUOTAS (ITQs and IFQs)	RECREATION	GENETIC RESOURCES (Access & Benefit Sharing)	LAND CONSERVATION	TRADABLE DEVELOPMENT RIGHTS	CERTIFIED FOREST PRODUCTS	CERTIFIED AGRICULTURAL PRODUCTS
BUYERS - first generic catagories, then a few examples	Regulated industry, governments, Carbon funds, Investors	Corporations (e.g. Mitsubishi, AEP, Cinergy, GM, Texaco), NGOs, Universities (Yale), individuals; Retailers	Treatment plants, other point source emitters, potentially government buyers through reverse auctions	Private, i.e. Evian, Vittel (France), Ecuador beer company, water utility, hydroelectrics, Vivendi, Lyonnaise, Florida Ice and Farm, Energia Global, Companiea Nacional Fuerza y Luz etc.; Coca-Cola; sugar companies (Guatemala), rice and palm agroindustry (Tanzania), mining companies (Peru), individual water users.	Government water agencies / utilities (City of New York), private utilities mandated by governments; Water authorities (Tanzania); Public water authorities (Peru/Mexico)	Public Works Projects, Dept. of Transportation, Military, commercial and residential real-estate developers	Corporations (Newmont, Anglo American, Shell, etc), major conservation NGOs, and individuals	National Governments throughout the world (incl. US, Australia, Brazil, China, New Zealand, etc); State and local governments; Private companies and foundations and NGO matching funding; Multi-lateral organizations (GEF/WB/UNDP); government owned utilities	Buyers: Individual fishers, fishing companies, or NGOs	Individuals and commercial operators, CC AFRICA	Pharma, Biotech (Diversa Corp, Genencor, Novozymes, Merck, others)	Federal agencies: National Park Service; The Bureau of Land Management; Fish and Wildlife Service; the Forest Service. State and local governments are frequent buyers. The largest land trusts in the United States are: The Nature Conservancy; The Trust for Public Land; The Conservation Fund; and Ducks Unlimited. In total, there are over 1600 land trusts in the U.S., many of which have funds to purchase easements.	New Jersey, Maryland, Brazil's Forest Code trading?; those wishing to continue development	Global middle/upper class, Home Depot, socially aware retailers	Industry partners: exporters, traders, processors, manufacturers, mainstream retailers (supermarket chains), specialty retailers (whole food, health food stores, organic shops, specialist coffee and tea shops, World Shops, fair trade, internet and mail-order sales)
SELLERS - first generic catagories, then a few examples	Project developers: Precious Woods (forestry related CDM); Pearl River project developers (State Forestry Administration,Research Institute of Forest Ecology, Chinese Academy of Forestry (RIFEEP), International Bank for Reconstruction and Development/ Bio Carbon Fund)	Retailers (ex. Go Zero, EAD Environmental, Carbon Fund, Climate Care, Blue Source, Green Fleet) Project developers (mostly NGOs, i.e. TNC, CI and Pre- CDM VERs), Governments	Non point source emitters, including farmers, owners of streams, wetland developers.	Private landowners, Utilities, Forest companies, National Parks or other government lands, cooperatives, etc., local development councils, communities living by parks and forests (Indonesia)	Private landowners, Utilities, Forest companies, National Parks or other government lands, cooperatives, etc., municipalities, upstream communities (Philippines)	Private: mitigation banking companies, landowners, NGOs/land trusts. Public: Municipal governments, Public works agencies - Dept. of Transportation.	Private and public landowners (for offsets, this could include conservation NGOs, indigenous groups, community organizations, and protected area reserve managers and companies)	Private landowners and land managers (farmers, communities); land stewards	Sellers: generally government fisheries agencies	Federal, state, and private land owners	Govt., states & communities (InBio, Center for Reproduction of Endangered Species (CERS) - San Diego Zoo); in developing countries it is possiblefor smaller communities, indigenous groups to become sellers; property rights are an issue	Private landowners ranging from individuals with several acres to commercial forestry companies with thousands of acres.	Those foregoing development	Certified producers	Small to large-scale producers
LAND-OWNERS, MANAGERS, AND STEWARDS (Sellers)	World Bank (through its BioCarbon Fund & upcoming Forest Carbon Partnership Facility)	Forestry companies, farmers, local communities (including indigenous groups/tribes), other private landowners, public agencies (state and national government landowners)	Farmers, residential lawns	Same as above	Same as above	Same as above, plus forestry companies, ranch & agricultural operations, mining operations.	Companies, Governments, NGOs, communities	Private landowners and land managers (farmers, communities)	Stewards include intermediaries (NGOs buying from government and selling to certified harvesters, for instance) and co-management parties		Communities, and indigenous groups	Most brokers are in Colorado. Significant brokers include: Colorado Conservation Connection; Conservation Resource Center; Conservation Tax Credit Transfer, LLC; Family Business Consultants, LLC; Gouger Franzmann& Hooke, LLC; Tax Credit Connection, LLC.		Private land owners (public, too?)	Any farmer

MARKET SHAPERS

	COMPLIANT CARBON FORESTRY	VOLUNTARY CARBON FORESTRY	COMPLIANT WATER QUALITY TRADING	VOLUNTARY WATERSHED MANAGEMENT PAYMENTS	GOVERNMENT-MEDIATED WATERSHED PES	COMPLIANT BIODIVERSITY OFFSETS	VOLUNTARY BIODIVERSITY OFFSETS	GOVERNMENT-MEDIATED BIODIVERSITY PES	INDIVIDUAL FISHERIES QUOTAS (ITQs and IFQs)	RECREATION	GENETIC RESOURCES (Access & Benefit Sharing)	LAND CONSERVATION	TRADABLE DEVELOPMENT RIGHTS	CERTIFIED FOREST PRODUCTS	CERTIFIED AGRICULTURAL PRODUCTS
REGULATORS/STANDARD SETTERS	CDM Executive Board and Climate Change Secretariat under UNFCCC (for Kyoto), NSW Independent Pricing and Regulatory Tribunal (for NSW), California Climate Action Registry (for California); RGGI (for RGGI states); US Federal Government	CCBA, Voluntary Carbon Standard (potentially), CCAR (PG & E credits); CCX board; UK DEFRA (potential "code of best practice" for retailers)	EPA, state water regulators, DNRs, country environmental or water ministries, watershed organizations or water districts	NA	Ag and Forestry Agencies, Water Agencies, Environment Agencies (i.e. Mexican National Water Commission)	Wetland Banking: USACE, EPA, NOAA, State DNRs, local government Species Banking: USFWS, state fish and wildlife agencies (i.e. CA Dept. of Fish and Game) BioBanking: NSW government Possibly RAMSAR IBAMA, Chico Mendez Institute	BBOP Advisory Committee monitoring/creating principles, methodologies, guidelines and working towards standards. Governments have focussed to date on regulatory requirements but are now exploring non-binding guidelines. Financial institutions (eg development banks, private banks) are defining requirements for loans.	US Government agencies (USFS, USDA, ect); Australian state agencies; (NSW, Dept of Sustainability & Environment); Developing country governments (Environmental ministries); International NGOs; Mulit-lateral organizations	Regulators/Standard Setters include government agencies and independent certifiers in certified fisheries	CBD, Costa Rica: Certification for Sustainable Tourism; Institute for Policy Studies: Center on Ecotourism and Sustainable Development - developing guidelines for accrediting sustainable-tourism certifiers	CBD - Bonn Guidelines, national governements, and international/local NGOs	The Internal Revenue Service reviews the tax credits associated with land conservation deals, and the Land Trust Alliance has established a certification program for independent land trusts. A state task force in Colorado looked at five areas in 2007 and recommended: Increased oversight and enforcement; Certification of appraisers needs to be standardized and strengthened; Certification of government agencies, land trusts and nonprofit organizations that hold the conservation easements; Consumer protection needs to be expanded for landowners; Pre-approval screening of transactions would remove uncertainties about the appraisals.		Sus Wood: FSC, Green Seal, SFI	IFOAM, FLO, Rainforest Alliance, UTZ, RSPO, Smithsonian, USDA
POLICY MAKERS	Member governments (for Kyoto), state government of NSW (for NSW), local country governments; NGOs	CCX members, NGOs (Climate Group, WRI, Environmental Defense etc.), organizations involved in verification standards (ex. DEFRA, Climate Group, CCBA, Green-e etc)	Federal, state and local legislators	NA	Federal, state and local legislators and International Treaties	Local, state, and fed legislators and international treaties	Governments that provide approval monitoring/evaluation, intergovernmental agencies, Convention on Biodiversity	Local, state and national legislators and government agencies; NGO and private sector representatives (often from core project group)	Policy Makers include national and state or provincial government agencies, regional fisheries councils, fishery-specific mutlilateral bodies (ICCAT, for example)		CBD & national governments	Federal, state and local agencies.			USDA, UNDP, FAO, OCIA, EU, ITF, UNCTAD, UNEP, FLO, Oxfam, WWF
ADVOCATES	TNC, CI, IUCN, CINQS, various forestry groups, including Hancock, TIMOs, etc.	Various NGOs (American Forests, Pacific Forest Trust, Ducks Unlimited), corporations, celebrities	EPA, ED, WRI, NMBA, Environmental Trade Network, Great Lakes Protection Network, Chesapeake Bay Program	Center for Conservation Incentives	TNC, CI and regional or local conservation organizations	Wetlands: TNC, Conservation Fund, American Land Conservancy, Local Land Trusts, Ducks Unlimited, ELI Species : Environmental Defense, Defenders of Wildlife, IUCN, Insight Investors (SRI), CELB (sustainable mining)	Companies wishing to manage the risk and opportunity arising from their projects' impacts on biodiversity; governments regulating and encouraging biodiversity; financial institutions that see the mechanism as a means to manage risk and create business opportunity; land management companies that see market potential. See the over 35 organisations on the BBOP Advisory Committee.	Governments, legislators, NGOs, multi-lateral institutions, landowners	Advocates include community groups, fisheries cooperatives, environmental NGOs such as ED,TNC	CI, TNC, IUCN	CBD, national governments, and international/local NGOs, International Co-operative Biodiversity Groups (ICBG), Edmonds Institute	The Land Trust Alliance functions as the main industry advocate and trade association.		Forest Stewardship Council; Scientific Certification Systems; Programme for the Endorsement of Forest Certification	TWN, RAFI, FAO, IFOAM, WWF, GEF, ICO, World Shops, Greenpeace, FOE, RSPO, ProForest, Oxfam
CRITICS	Greenpeace, Climate Action Network (CAN), Friends of the Earth, Forestry Environmental Resource Network (FERN), Sinkwatch	Greenpeace, Climate Action Network (CAN), Friends of the Earth, Forestry Environmental Resource Network (FERN), Sinkwatch, various journalists	Fertilizer companies, farm companies	NA	Anti water privatization folks, i.e. Friends of the Earth	National Wildlife Federation, Chesapeake Bay Foundation, Sierra Club, Audubon Society, Greenpeace, Friends of the Earth, US General Services Office (GAO)	Some advocacy environmental and community organisation NGOs may be sceptical about biodiversity offsets, particularly of the danger that they could allow inappropriate projects to proceed, that 'no net loss' of biodiversity is not a possibility, that it won't be delivered in practice by projects, and that communities will not benefit.	Community groups, NGOs, analysts, scientists (disagreement with metrics defined by programs), participants (due to lack of clarity in process)	Critics include other environmental NGOs and fisher advocacy groups.		Anti-privatization NGOs	Critics of tax policy abuse, specifically the Joint Committee on Taxation in Congress.		Critics of SFI	
MULTILATERAL/BILERATAL/ DEVELOPMENT AGENCIES	World Bank (through its BioCarbon, Prototype Carbon, and Community Development Carbon funds), Netherlands Euopean Carbon Fund, KfW Carbon Fund, Spain & Italy? Finnish CDM/JI Pilot Programme, Asian Development Bank CDM Facility (project support, not $).	World Bank (through its BioCarbon and Community Development Funds), GEF (World Bank, UNEP, UNDP)	World Bank, USAIS, UNEP	NA	World Water Council, DANIDA, USAID, IFAD, The World Bank	RAMSAR, Convention on Biological Diversity, CITES	Major development aid agencies IFC, Convention on Biological Diversity, GEF, World Bank, etc.,	All major development aid agencies could be involved, inlcuding GEF, WB, UNDP, etc	Mutlilateral and development agencies with potential to be market shapers include UNDP, UNEP, the World Bank, and regional and lateral development aid organizations.	IFC, OECD?	All multi and bi-lateral agencies (InterAmerican Development Bank)	NA			GEF, UNDP, UNEP, IFC, USAID, IAF, Worldbank, IDB, CEC

MARKET SERVICE PROVIDERS

	COMPLIANT CARBON FORESTRY	VOLUNTARY CARBON FORESTRY	COMPLIANT WATER QUALITY TRADING	VOLUNTARY WATERSHED MANAGEMENT PAYMENTS	GOVERNMENT-MEDIATED WATERSHED PES	COMPLIANT BIODIVERSITY OFFSETS	VOLUNTARY BIODIVERSITY OFFSETS	GOVERNMENT-MEDIATED BIODIVERSITY PES	INDIVIDUAL FISHERIES QUOTAS (ITQs and IFQs)	RECREATION	GENETIC RESOURCES (Access & Benefit Sharing)	LAND CONSERVATION	TRADABLE DEVELOPMENT RIGHTS	CERTIFIED FOREST PRODUCTS	CERTIFIED AGRICULTURAL PRODUCTS
INVESTORS	Project evelopers (ex. EcoSecurites, AgCert); brokers (ex. CO2e); Investors (ex. Cheyne Capital Fund; Climate Change Capital; Generation Investments etc.)	Investors (ex. Climate Change Capital, Cheyne Capital) ; Project Developers (ex. Ag Cert, EcoSecurities); Brokers (ex. Evolution Markets); Final sellers (ex. Carbon Fund)	None yet.	Vivendi, Lyonnaise, etc.	Aqua America, Inc., Sustainable Asset Management water fund	Private investment firms: MuniMae Sustainable Land Investments, Parthenon Capital, Ecosystem Investment Partners, New Forests, Equator Environmental, Lehman Brothers	Growing interest from banks.	Governments	Investors include investment banks with green portfolios; private foundations such as Packard and Moore; fisheries trade associations.		?	Secondary buyers of tax credits under State programs. For-profit conservation companies: Lyme Timber; New Forests Inc.; Beartooth Capital; Sustainable Land Fund; Ecosystem Investment Partners, etc.		Socially Responsible Investors in the US and Europe ?	Traditional agricultural investors
PHILANTHROPIC INVESTORS	Climate Group of Foundations	FACE Foundation (Dutch), Prima Klima (German NGO), Care International	Joyce Foundation, GLPF	Bilaterals/Companies, NGOs (WWF)	TNC, World Bank, CI and other private foundations	Non known yet.	All major foundations that focus on biodiversity, conservation NGOs, multilaterals	NGOs, multi-lateral institutions, private foundations				See buyers - there are roughly 1700 land trust in the U.S.		Foundation funders of FSC	Various
TRADE ASSOCIATIONS	IETA, INCS	National Carbon Offset Coalition, INCS	Environmental Trading Network	Trade associations of water companies, Water Environment Fund	NA	National Mitigation Banking Association, Society for Ecological Restoration, Association of State Wetland Regulators	Research and interest from ICMM, IPIECA, and well attended fora in IAIA.	None		The International Ecotourism Society		Land Trust Alliance			OTA, ITC, IFAT, EFTA, NEWS!, CSPA, ICO, Specialty Coffee Association of America, International Coffee Register, ECOM Agroindustrial Corporation, ICCO, RSPO, Malaysian Palm Oil Board, GreenPalm Ltd., Association of German Fish Processors and Whole-salers, Pacific Organic Seafood Association
MAJOR CONSULTANTS/BROKERAGES	A huge range; ex. C02e, Evolution Markets, Natsource, EcoSecurities, ICF	A huge range; ex. C02e, Evolution Markets, Natsource, EcoSecurities, ICF				Only small individuals at this point	Environmental consultancies and land management companies such as New Forests have expressed interest.	None mentioned			Large biological, botanical research organizations: Kew gardens?	Colorado leads the nation in providing tax credits for the donation of a conservation easement. Tax credits are transferable to a third party. In 2000, the Conservation Resource Center (CRC), a nonprofit land conservation organization, established the Tax Credit Exchange which created the market to transfer these credits. To date, CRC has facilitated over 1000 tax credit transfers.		Forwood International;	Various
LAND MANAGEMENT SERVICE PROVIDERS	World Bank	NGOS (ex. TNC); Forestry companies (ex. New Forests); National Governments (ex. Costa Rica) etc	NA			Center for Natural Lands Management, local land trusts, & other land management firms	Possibilities for conservation banking organizations and land managers from the country concerned and from countries where such industry sectors are already established (eg US).	local and national NGOs			none	Environmental consultants.		Certifiers and technical assitance forestry consultants	NA
TECHNICAL SERVICE PROVIDERS (legal, monitoring, verification)	Winrock Intl. (assessment, monitoring, verification), Edinburgh Centre for Climate Management (project assessment & development, measurement, reporting), Ecosecurities, Trexler (project assesment & development, reporting, marketing), DNV, TUV, SGS (validation), Baker & McKenzie (legal).	Winrock Intl. (assessment, monitoring, verification), Edinburgh Centre for Climate Management (project assessment & development, measurement, reporting), Ecosecurities,	Monitoring, hydrology	FUNDECOR, hydrologists, other scientists, ICRAF, CGIAR group including CIFOR, CSIRO, PEMA (Tanzania), CSIRO - Center for Science Industrial Research (South Africa), IIED, CARE	FUNDECOR, hydrologists, other scientists, ICRAF, CGIAR group including CIFOR, CSIRO	Members of SER, hydrologists, nurseries, surveyors, law firms, engineering and construction firms (Parametrix, CH2MHill), Wildlife consulting firms, Environmental Defense, Nature Serve, NGOs	NGO intermediaries; university departments; government research institutions; consultants; certification companies.	International NGOs; National NGOS -SEMERNART (Mexico), FONAFIFO (Costa Rica), FUNBIO (Brazil), CONAM (Peru); government agencies (Dept of Sustainable Ag, Catchment Authorities [Australia]); program participants	Environmental NGOs and coalitions play an important role in monitoring, assessing effectiveness, determining externalities, and tracking market trends (Resources for the Future has been particularly active in this regard).	RARE Center for Tropical Conservation	Academic research organizations	Environmental consultants often provide appraisal, restoration and monitoring services related to the purchase/donation of conservation easements. Tax attorneys often help in the structuring of transactions.		Brinkman, Smartwood	USDA (US - accreditor), NASAA (AU), FAO, ILO
FINANCIAL SERVICE PROVIDERS	Brokers (e.g. Natsource, Cantor Fitzgerald, Evolution Markets), consultants (e.g. Ecosecurities, Baker & McKenzie), large NGOs (e.g. CI, TNC), brokers (e.g. Natsource, Cantor Fitzgerald, Evolution Markets), financial consultants (e.g. Ecosecurities), large banks i.e. ABN AMRO, HSBC, Citigroup, Climate Change Capital	Brokers (e.g., Natsource, Cantor Fitzgerald, Evolution Markets), Consultants (e.g., Ecosecurities, Baker & McKenzie), large NGOs (e.g., CI, TNC), Carbon retailers (e.g., Future Forests, Green Fleet, EAD Environmental)	Watershed specific arrangements.	Same	Not developed yet	Bonding companies, financial assurance, letters of credit	Banks, investors, insurers	Government agencies		IFC		Most major land trusts work with local tax attorneys, environmental consultants and/or financial institutions when structuring deals.			Various
ACADEMICS	QUEST (Bristol Univ.), ENCOFOR (European Academic & Research Alliance), CATIE (Costa Rica), CIFOR (Indonesia), ICRAF (Africa + global)	QUEST (Bristol Univ.), ENCOFOR (European Academic & Research Alliance), CATIE (Costa Rica), CIFOR (Indonesia), ICRAF (Africa + global)	Hannah Breetz and Karen Fisher-Vandenat Dartmouth on WQ Trading and Offsets; Dennis King at the Univ. of Maryland on the Market Drivers for WQ trading; Morgan Robetson of EPA on Pollution Trading; Various faculty at Rutgers University, Feng Fang of Kieser & Associates on WQ trading; Paul Faeth at WRI on Trading. David Letson at Univ of Miami on WQ trading and effects of climate on water resource mgmt.; Ginny Kibler at US EPA on WQ trading; Beth McGee at CBFon Bay restoration and water quality; G. Tracy Mehan at the Cadmus Group on WQ trading and Wetlands Restoration.	IIED researcher: Daniele Perrot-Maitre	China: Changjin Sun (cjsun@163bj.com) and Chen Liquao (liqiaochen@163.com), Chinese Research Center for Ecological and Environmental Economics Beijing;Forestry and Land Use, NRGroup, IIED, London (ivan.bond@iied.org); Mexico: Alejandro Guevara at Universidad Iberoamericana, Carlos Munoz at Instituto Nacional de Ecologia. Costa Rica: Stefano Pagiloa, World Bank;	Environmental Science, law, carthography, hydrology, wildlife biologists, MBA programs (Jim Salzman)	Biologists, Botanists, Zoologists, Taxonomists, Ecologists, Anthropologists, Economists, Planners, Lawyers	Research institutions; biologists; multi-laterals	Key acadmeics and information providers include James Sanchirico, now at UC Davis, Bonnie McCay at Rutgers University; FAO in Rome maintains the global database on fisheries and has commissioned a report on quota fisheries. Academics have played an important and non-partisan role in evaluating existing ITQ programs and assessing the potential for new markets.	Griffith University (Australia), International Centre for Ecotourism Research; University of Colorado, Boulder: Leeds School of Business, Center for Sustainable Tourism	Oregon State University (Dr. William Gerwick)	Nancy McLaughlin (Law professor at the University of Utah); John Echeverria, Director of the Georgetown Environmental Law and Policy Institute; Sally Fairfax, biologist at UC Berkeley.	Various have looked at this; large fisheries colleges, etc.	Yale Global Institute of Sustainable Forestry	Various
INFORMATION PROVIDERS	Ex. Point Carbon, Environmental Finance, Sinks Watch, NSW GHG Registry (for NSW projects), Next Gen (for NSW Projects); Climate Trust website (for Oregon projects), project developer and buyer websites, Evolution Markets, Ecosystem Marketplace	Ex. Ecosystem Marketplace, Point Carbon, Carbon Positive etc.	Environmental Trading Network, Flows, Water Strategist, Carnegie Institute at Dartmouth, ELI, EPA, Red Barn Trading and the Ecosystem Marketplace	NA	Flows (online), USDA, EPA, Water Environment Federation, IIED	Ecosystem Marketplace, National Wetlands Letter, ELI publication, California Insider and state-wide regulatory publications, USACE -- RIBITS, local papers, NatureServe, National Heritage, EPRI, USFWS	Newsletters and websites, publications from a variety of organisations. See www.forest-trends.org/biodiversityoffsetprogram.	Government Evironmental Agency news/websites; NGOs (Katoomba Group, Ecosystem Marketplace); Multi-lateral websites and news bulletins;		Journal of Sustainable Tourism, The International Ecotourism Society, Planeta.com	CBD	NGO newsletters, Land Trust Alliance, Lincoln Land Institute, The Ecosystem Marketplace	None	Forestweb; Foresttrade Asia; Greenspec	Beyond Organics

FUTURE DIRECTION

	COMPLIANT CARBON FORESTRY	VOLUNTARY CARBON FORESTRY	COMPLIANT WATER QUALITY TRADING	VOLUNTARY WATERSHED MANAGEMENT PAYMENTS	GOVERNMENT-MEDIATED WATERSHED PES	COMPLIANT BIODIVERSITY OFFSETS	VOLUNTARY BIODIVERSITY OFFSETS	GOVERNMENT-MEDIATED BIODIVERSITY PES	INDIVIDUAL FISHERIES QUOTAS (ITQs and IFQs)	RECREATION	GENETIC RESOURCES (Access & Benefit Sharing)	LAND CONSERVATION	TRADABLE DEVELOPMENT RIGHTS	CERTIFIED FOREST PRODUCTS	CERTIFIED AGRICULTURAL PRODUCTS
EMERGING DEVELOPMENTS THAT MAY SHAPE THE FUTURE OF THE MARKET	International REDD policy	International REDD policy; US state and federal regulation	Because of the limitations of existing regulatory schemes to address non-point source pollution, new opportunities such as totally private markets, must be cultivated outside of existing government regulatory systems. Trading schemes must be designed to provide water quality monitoring data in order to quantify environmental results/improvements.	With private companies entering into the groundswell of interest/activities associated with "going green" or being "carbon neutral" there is sure to be growth in the number of private interests protecting their own bottom line and in turn positively protecting the value of ecosystem services.	With burgeoning interest in water quality around the globe, direct payment schemes should see steady if not rapid growth.	Other forms of creating and selling ecosystem credits, such as species recovery credits (USFWS, Ft Hood), will impact the industry's future in the US. New regulations for wetland banking (2008) will likely favor credit banking over project-specific and in-lieu fee mitigation, possible leading to overall growth. Australia's programs are in their infancy, they could take off dramtically. The volundary conservation bank in Malaysia could inpact the way regulatory banking is done elsewhere.	Emergence of methodologies and standards; more regulatory requirements; more credit/lending requirements; more practical examples; market opportunities.	Secured government funding and commitment from NGO and multi-lateral communities ensures continued financing of these types of programs and potential ongoing positive results. Because of their configuration as longer term financially sustainable endeavors, biodiversity funds are more likely to attract ongoing investment money than government programs which tend to pay out subsidies and rely on public funds. Thus the environmental benefit characteristics of these funds are of high importance to expected biodiversity impacts in the future. National biodiversity funds have the potential to encourage other governments to co-finance and leverage financial investments and develop their own programs for biodiversity. Many emerging debt for nature swaps with have taken place in the last few years, anf offer interesting replicable models. To the extent to these are successful for biodiversity, additional debt forgiveness programs could arise.	ITQ systems are becoming more sought after as conventional management fails more and more fisheries, however, there are reasons to proceed with caution, especially concerning the potential for inequities in market-based fisheries in underdeveloped areas. One important segment of this market that bears watching is the environmental NGO-mediated purchase of leases or quotas, as exemplified in the Central California trawl fishery buy-outs and resales by TNC / ED.			On December 12, 2007, Congress passed the Farm Bill with provision S.496, which will make the tax incentives for conservation easements permanent. If a House-Senate conference approves the bill in January 2008, the provision will be made retroactive to January 1, 2008. This development is likely to continue the huge growth in the use of conservation easements into the next decade. Additionally, should more states adopt tax incentive programs that sweeten the deal by making tax credits tradable, then easement use should expand event faster. Likely exceeding the 25% growth rate listed above for this area of activity.			Although certified Agroproducts are now present in most parts of the globe, demand remains concentrated in North America and Europe. However, the global economic development and increasing consumer demand from rapidly growing markets in Asia (especially China, Japan, India) is increasingly favoring typically "western" products, particularly cacao, coffee and palm oil products. The strong growth rates are expected to be reflected also in the certified market of these products. Furthermore, increased public interest in carbon sequestration (due to the changes in global climate) may provide an incentive to emphasize the potential of organic and biodiversity-friendly ag-practices to contribute to reduce CO2 emissions.

*Because these markets are rapidly changing and growing, the findings and figures in this summary draw from the best and most recent available data.

**This publication may be reproduced in whole or in part and in any form for educational or non-profit services without special permission from the copyright holder, provided acknowledgement of the source is made.