

INNOVATIVE MARKETS AND MARKET-LIKE INSTRUMENTS FOR ECOSYSTEM SERVICES





THE MATRIX 2013

FES MARKET COMPLIANCE FOREST CARBON VOLUNTARY PRIVATE SECTOR WATER QUALITY TRADING COMPLIANCE MARKETS COMPLI															
PES MARKET				· ·	PAYMENTS							· ·			
SUB-MARKETS	Implementation (JI); New Zealand Emissions Trading Scheme (NZ	domestic voluntary programs (Japan-, Korea- and Thailand-based Verified Emissions Reduction programs; Costa Rica C-Neutral	Numerous bi- and multi-lateral funding arrangements. Examples include Norway-Indonesia Bilateral REDD+ Deal, World Bank Forest Carbon Partnership Facility, UN-REDD Programme, Congo Basin Forest Fund, Amazon Fund, Norway-Guyana REDD Investment Fund, Japan Bi-lateral Offset Credit Mechanism, KfW support to Acre's jurisdictional program, etc.	Canada, US (multiple states), Australia (New South Wales), New	MillerCoors), Industry & Manufacturing (particularly food	Japan, Indonesia, Mexico, Nepal, Peru, Philippines, Tanzania, Sout Africa, US (NYC and other municipal drinking water programs,		US Compensatory Mitigation (ESA & CWA - permittee-responsible, credit banking & in lieu fee), Australia's BioBanking, BushBroker, & others, Canada's fish habitat ('HADD') compensation, EU Habitats & Birds Directives offsets, Germany's Impact Mitigation Regulation (Einsgriffsregelung), China's Forest Revegetation Fee, Brazil's compensation mechanisms, Biodiverisity offset or compensation policy or EIA law active in about 20 other countries or states Programs in development in over 20 countries or states	Extractive industry offsets, BBOP, Wal-Mart, Malua BioBank	National conservation programs funding Biodiversity (US Farm Bill, Brazil, Australia, etc); government funds for biodiversity conservation (United Kingdom, New Zealand, Kazakhstan, etc.); Debt for Nature swaps (Bolivia, Costa Rica, etc.); habitat- or speciesspecific conservation program (Mexico, Brazil, Australia)	Ecotourism, park fees, hunting licences (Campfire & CC Africa)	Pharma, biotech, academic institutions	Individual Transferable Quotas (ITQs) or catch shares exist in most developed country and many developing country commercial fisheries. There is also an emerging market of tradable use and access rights for marine space and recreational fisheries. Currently this is small, but has potential for growth.	Coffee, cocoa, banana, tea, palm oil, marine fisheries, and organic (various products)	Certified sustainable and verified legal wood products: logs, lumber, furniture, pulp/paper, plywood, panels, etc. (packaging usually considered paper)
MARKET DRIVER ECOSYSTEM SERVICE CATEGORY	Compliance with domestic or international emissions caps (cap-and-trade) or other carbon price mechanism	Voluntary, public relations & corporate social responsibility; preparing for regulation; individuals	Currently development aid, anticipated to transition into performance-based payments for emissions reductions Carbon	Cap-and-Trade/Compliance Water	Voluntary Private (excludes business contributions to water quality trading or instream buybacks) Water	Government or third-party mediated	Generally voluntary Water	Cap-and-Trade/Compliance Biodiversity	Voluntary Private Biodiversity	Often government or third-party mediated Biodiversity	Voluntary Private Biodiversity	Voluntary and government-mediated Biodiversity	Cap-and-Trade/Compliance-Driven Market Fisheries Production	Certification/Voluntary and Compliance	Certification/Voluntary and Compliance Bundled
CURRENT SIZE OF MARKET	LIG (EG) III	US \$185 million		HS 47.7 million	115 f4 2 f4 0 - 115	LIG to hilling					US \$115-230 billion	US \$35 million		Lic #CA ESS	
(in US \$ per annum) POTENTIAL SIZE BY 2015 (in US \$ per annum)	US \$52 million US \$217 million	US \$215 million	US \$252 million disbursed in 2012, (of ~\$4 billion pledged) US \$.7 billion	US \$7.7 million US \$8 million	US \$4.3 - \$4.8 million US \$5.5 million	US \$8 billion US \$8.7 billion	US \$170.9 million US \$178 million	US \$3 billion US \$3-4 billion	US \$25 million US \$30 million	US \$2 billion US \$2.3 billion	US \$90 billion	US \$35 million	US \$5 billion US \$6 billion	US \$64 billion US \$97 billion	US \$54 billion (\$20 billion - FSC only) US \$57 billion (FSC only)
POTENTIAL SIZE BY 2020 (in US \$ per annum)	US \$2.2 billion	US \$1.2 billion	US \$3-9 billion	US \$10 million	US \$10 million	US \$11.5 billion	US \$200 million	US \$5-8 billion	US \$70 million	US \$2.9 billion	US \$200 billion	US \$100 million	US \$9 billion	US \$190 billion	US \$228 billion (FSC only)
CURRENT RATE OF GROWTH (annual %)	55% annual average growth in volume	60% annual average growth in volume	Pledges for fast-start (2009-2015) REDD+ funding reached close to \$30 billion for the 2010-2012 period - around \$4.5 million of this amount was explicitly targetted toward REDD by end of 2010. VRD reports that as of the end of 2012, 85% of these pledge amounts had been committed, with 65% expected to be disbursed by end of year. Actual disbursement of funds is slow and difficult to gauge so far.		3%	3%	2%	10%	10%	1%	4%	1%	5%	15%	50%
CURRENT SIZE OF MARKET IN DEVELOPING COUNTRIES (in US \$ per annum)	US \$52 million in forest carbon offsets was contracted from Clean Development Mechanism (CDM) afforestation/regorestation projects based in developing countries in 2011	US \$104 million in forest carbon offsets was contracted from voluntary projects based in developing countries in Latin America, Asia, Oceania and Africa in 2011		Size and volume in developing countries unknown but is assumed small; very insignificant because regulatory infrastructure and real enforcement are required.		Africa US \$110 million; Asia US \$7,500 million; Latin America US \$84.6 million	Volume in developing countries is unknown but likely VERY INSIGNIFICANT since the mechanism requires; high institutional capacity supporting water rights markets and legal recognition of environmental use are required. South African legislation requires reserves recognizing environmental water needs and the human right to water but does not use market mechanisms to secure environmental flows.	US \$2.65 m - Brazil's 'developer's offsets' US \$? - Other progams unknown Unknown how many ecosystem offsets are driven by EIA regulation	US \$12-18 million (probably 50% of all voluntary biodiversity offset activity is in developing countries)	US \$487million	Information unavailable	Information unavailable	US \$0.8 billion	US\$2 billion	US \$1.85 billion
POTENTIAL IN DEVELOPING COUNTRIES	The entry of international REDD offsets into California's cap-and-trade program in 2015 could elevate compliance demand for forestry offsets from developing countries. Promising, too, is the emergence of domestic carbon price mechanisms in developing countries, which could acknowledge support for forestry as an offset type.	, , , ,	REDD+. Indonesia, Brazil, India, the DRC and China alone are	regulatory/enforcement capacity. Potential for growth is limited in the short-term, but possibly large as government regulatory systems develop, especially in the higher-income developing	currently more prevalent in developing countries than in developed a gap which is partly explained by varying levels of environmental regulation, but due also to "social license to operate" and local livelihoods considerations. Institutional and technical capacity to administer investments and link interventions to outcomes may be a barrier, but can be over come through partnerships between business and an NGO or existing mechanism (as in the case of several water funds in Latin America) or government initiative (sucl as with the South African government's 'Working for Water' program). Good potential for future growth, driven especially by	, 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. Water funds are the fastest-growing watershed investment project type in Latin America - with over thirty expected to be active by 201 5 - and a model of considerabl interest in other regions. There has also been increased interest in natural water	property rights. Cultural/informational barriers may also be significant.		voluntary and therefore does not rely on government legislation. However, it relies on rigorous scientific and social design and	developed countries are taking an increased interest in biodiversity		run into problems, specifically with regard to benefit sharing.	Low-Med: About 15% of developing countries currently has some form of quota system. Regionally, African countries tend to adopt quota-based systems and countries in Asia and the Pacific tend towards space-based property rights systems which may be transferable.	Medium	Good potential but many barriers. Lots of capacity building and better governance/regulation needed. Changes in managing forest are needed. Very difficult for land owners to become certified without land tenure.
CHALLENGES AND OPPORTUNITIES (specific to communities and developing countries)		projects are fast improving (evidenced by growing pipeline of certified forestry offsets), thus restrained offset demand remains	commitments—a major barrier. While significant funding has been committed for REDD "readiness" it is unclear whether industrialized country governments will mobilize the far larger sums (estimated at US \$15	measurement and monitoring) and technological capacity (in term of pollution controls). Water quality trading mechanisms are generally easier to implement where pollution comes from a few large emitters like factories or wastewater treatment plants than where pollution sources are diffuse, as with agricultural productions. The 'polluter pays' principle embedded in water quality trading may be well-suited to funding-contrained public officials; on the other hand, it may lead to or increase inequity if required compensation or changes in land management affects livelihoods.	Greatest opportunities are in sectors where dependence on watershed services can be easily observed or demonstrated, such as hydroeletric power operators, beverage companies, etc. Companies may require significant expert support in carrying out analysis of watershed service impacts/risk and developing/implementing interventions. Watershed stewardship cabe linked to reputational concerns and 'license to operate' in	programs build training into the design of the program, especially those where funding may come from outside the community. For funds, securing upfront capital for the principal may be difficult.	frameworks, including clear and transferable property rights and legal recognition of environmental flows as legitimate use.	with monitoring and enfocement capabilities are needed,			ecotourism has made some consumers wary and limits the	decreased with the tarnished image from "biopiracy" controversies and a lack of assurances about benefit sharing to governments and indigenous groups in developing countries. The recently agreed upon Nagoya Protocol on Access to Genetic Resources and the Fail and Equitable Sharing of Benefits Arising from their Utilization may	challenges. Nonetheless, trends point toward development of ITQ in high-value fishing industries and in countries with higher World Bank governance rankings. In countries with weak national governments, close-knit communities with relatively secure control over the resources and capacity for monitoring and enforcement can be a mechanism for development of rights-based fisheries. Not transferable quotas or catch shares systems, e.g., Grenada, Mexico	currently small, but in several countries local demand and local markets are developing rapidly. Certified agricultural products hav potential to add value to products through price premiums, and production can generate employment and income while improving food security and ability to adapt to climate change. While opportunities exist, developing countries face many challenges in	developments offer hope for greater future growth and scalability: The Forest Law Enforcement Governance and Trade (FLEGT) Voluntary Partnership Agreements between EU and a number of tropical forest countries.
ENVIRONMENTAL BENEFIT METRIC	Emissions reductions and carbon sequestration (measured in tCO $_{ m 2}{\rm e})$	Emissions reductions and carbon sequestration (measured in tCO	₂ e) (Upon implementation), emissions reductions and carbon sequestration (measured in tCO ₂ e)		Quality or Quantity of water improved or protected x degree of protection, potentially = pounds water-borne pollutants avoided o gigaliters of avoided water extractions		Gigalitre or acre-foot of restored/maintained instream flow or diversion to offstream uses x ecological value of action, where water rights/allocations are purchased/leased for conservation purposes	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.	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.	Increased or stable fish biomass; decreased by-catch; fish catch stable over time; lower fish mortality rate	Habitat, species, soil, and water protection	Acres of sustainably managed forests
CURRENT ENVIRONMENTAL BENEFIT (per unit spending: where 1=low and 5=high)	Medium (2)	Medium (3)	Low (1)	Low/Medium (2.5)	Low/Medium (2)	Low/Medium (2)	Low/Medium (2)	Medium (3)	Medium (3)	Medium (3)	Medium/Low (2)	Medium (3)	Medium (3)	Low/Medium (2)	Medium/High (4)
POTENTIAL ENVIRONMENTAL BENEFIT (per unit spending: where 1=low and 5=high) CONSERVATION BENEFIT METRIC	High (4)	High (4)	High (5) (Upon implementation), forest (native) area restored and/or	Medium/High (4) Acres of watershed protected, acres of farmland sustainably	High (5)	Medium/High (4)	Medium/High (4)	Medium/High (4)	Medium/High (4) Proxies for overall biodiversity quality and quantity, usually	High (5) Hectares of restored or conservation managed land and protection	Medium/High (4)	Medium/High (4)	Medium/High (4)	Medium (3)	Medium/High (4)
(hectares impacted) CURRENT LAND CONSERVATION VALUE	Forest (native) area restored and/or protected	Forest (native) area restored and/or protected	(Upon implementation), Torest (native) area restored and/or protected	Acres of watersned protected, acres of farmland sustainably managed	Acres of land protected or restored	Acres of land protected or restored	Indirectly, linear miles of riparian habitats protected by maintainin natural flow regimes.	Acres of habitat conserved or restored	measured as a combination of habitat quality improvement and area Medium/Low (3)	of specific wildlife habitats; product of species conserved		Acres of high biodiversity Medium/Low (2)	N/A	Hectares of sustainably managed agricultural land Low/Medium (2)	Acres of sustainably managed forests Medium(High (4))
(per unit spending: where 1=low and 5=high) POTENTIAL LAND CONSERVATION VALUE (per unit spending: where 1=low and 5=high)	High (4)	Medium (2) High (4)	Low (1) High (5)	Medium (3)	Medium (3) High (5)	Medium (3) Medium/High (4)	Low/Medium (2)	High (5)	High (5)	Medium/High (4) High (5)		Medium/Low (2) Medium/High (4)	N/A	Low/Medium (2) Medium (3)	Medium/High (4) Medium/High (4)
BUYERS	Regulated industry, governments, private and institutional investors, offset traders	Corporations (e.g., Disney, General Motors, Microsoft), NGOs, Universities, individuals, other offset suppliers/intermediaries	Donor countries	Treatment plants, other point source emitters, potentially government buyers through reverse auctions	companies, food manufacturers, other industry & manufacturing,	municipal water authorities), private utilities mandated by governments; water authorities (Tanzania); public water authoritie (Peru/Mexico); national infrastructure development agencies, publ	Murray–Darling Basin' program; New South Wales' Riverbank and Wetland Recovery programs; Conservation organizations (Water f Rivers). MEXICO: Federal government; Conservation organizations (Pronatura Noreste). US: US Bureau of Reclamation; Conservation			National Governments throughout the world (incl. US, Australia, Brazil, China, New Zealand, etc); State and local governments (incl. Australian, Brazilian, Indian states); Private companies and foundations and NGO matching funding; Multi-lateral organizations (GEF/WB/UNDP); government owned utilities	Individuals and commercial operators, CC AFRICA	Pharmaceutical, Biotechnology, Academic institutions (Diversa Corp, Genencor, Merck, Novozymes, others)	Fishers: Individual fishermen, fishing companies; Intermediaries: ITC brokerage firms, NGOs	Nestlé, Kraft, Sara Lee, Starbucks, Tchibo, Lavazza, Kraft-Cadbury,	packaging sectors, green procurement, green building, furniture products: Home Depot, Lowes, Tetra Pak, Kleenex, etc.
SELLERS	1 /		Forest nations 5,	Non point source emitters, including farmers, forest owners, 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)	other government lands, cooperatives, etc., municipalities,		Private: mitigation banking companies, landowners, NGOs/land trusts. Public: municipal governments, public works agencies - departments of transportation, Public parks 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		Small- to large-scale producers	Producers and manufacters (CoC)
LAND-OWNERS, MANAGERS, AND STEWARDS (Sellers)	indigenous groups/tribes), other private landowners, public	Forestry companies, farmers, local communities (including indigenous groups/tribes), other private landowners, public agencies (state and national government landowners)	Not yet applicable	Farmers, home owners with lawns	Private landowners, utilities, forest companies, national parks or other government lands, cooperatives, etc., local development councils, communities living by parks and forests (Indonesia)			Same as above, plus forestry companies, ranch & agricultural operations, mining operations, Public parks agencies	Companies, governments, NGOs, communities	Private landowners and land managers (farmers, communities)		Communities, and indigenous groups, governments	Fishermen, fisheries management agencies	Agricultural producers	Private (industrial) land owners, non-industrial forestland owners, communities, state-owned.
REGULATORS/STANDARD SETTERS	under UNFCCC (for Kyoto), California Air Resources Board (for California); individual state legislatures (for RGGI states); US Federal Government; New Zealand Ministry of Forestry; Australian Federal	though some domestic regulations (in New Zealand, Turkey, etc.); standard setters include independent third-party project standards organizations (e.g., American Carbon Registry; Climate Action Reserve; Climate, Community & Biodiversity Alliance; Verified		and FS; country environmental or water ministries, watershed organizations or water districts	technical/scientific support or to implement a standard project type	, agencies (i.e., Mexican National Water Commission); potential for	Competition and Consumer Commission; Irrigation infrastructure operators. US: State agencies, which vary considerably by state - fo example, responsibility of the State Engineer in New Mexico, versus	US Wetland and stream banking: US ACE, EPA, NOAA, State DNRs, local government US Conservation banking (endangered species): USFWS, state fish and wildlife agencies (i.e. CA Dept. of Fish and Game) BushBroker: Victoria Department of Sustainability and Environment BioBanking: New South Wales Department of Environment, Climate Change, and Water Canada's fish habitat ('HADD') compensation: Department of Fisheries and Oceans Fish Habitat Management Branch EU Habitats & Birds Directives offsets: European Commission provides oversight, but member states create national policy that conforms with the directives and enforce the policy Germany's Impact Mitigation Regulation (Einsgriffsregelung): German state environmental authorities Stardard setters include those who develop the methods but don't necessarily enforce them. Ex. TNC, BBOP, etc, etc.	methodologies, guidelines and working towards standards. Financial institutions (eg development banks, private banks) are defining requirements for loans. Industry organizations (eg - Round Table on Sustainable Palm Oil) are considering the role of offsetting	(environmental ministries); international NGOs; multi-lateral organizations	Policy Studies: Center on Ecotourism and Sustainable Development developing guidelines for accrediting sustainable-tourism certifiers, Nature's Best methodolog developed by Swedish Ecotourism Association and the Nature and Ecotourism Accredation Program by the Australian Ecotourism Association	, , , , , , , , , , , , , , , , , , , ,	Government: Fisheries management agencies or ministries for issuing quotas and for setting total allowable catch		certification. Interim standards: Generic Forest Stewardship Standards. EU and US governments setting public procurement policies (UK timber regulation and Lacey Act in US). Individual European governments who set their own public procurement
POLICY MAKERS		Few formal policies regarding voluntary offset market, though some development of self-regulation (e.g., International Carbon Reduction and Offset Alliance Code of Best Practice, Green-e Climate standard for retail transactions, etc)	National policymakers, policy and executive boards of multilateral funds/initiatives	Federal, state and local legislators	Federal, state, and local regulators (where approval is required)	Federal, state and local legislators and international treaties	AUS: Australian Government National Water Commission, Murray Darling Basin Authority; US: State legislatures	- Local, state, and federal/national regulators, International Finance Corporation (IFC), World Bank	1 11	Local, state and national legislators and government agencies; NGO and private sector representatives (often from core project group)		CBD & national governments (perhaps also WTO, with TRIPS agreement)	Government: National and state or provincial government agencies International bodies: regional fisheries councils, fishery-specific mutlilateral bodies (ICCAT, for example)	Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), United Nations Conference on Trade and Development (UNCTAD), International Trade Centre (ITC), Unites States Department of Agriculture (USA), United Nations Environment Program (UNEP), United Nations Developmer Program (UNDP), International Task Force on Harmonization and Equivalence in Organic Agriculture (ITF), Organic Crop Improvement Association International (OCIA), Global Environment Facility (GEF) European Union (EU), national policies (e.g., Japan, Australia)	
ADVOCATES	International Forest Carbon Association (IFCA), The Nature Conservancy, Conservation International; and institutional	Various NGOs and industry associations, including Code REDD, the International Forest Carbon Association (IFCA), The Nature Conservancy, Conservation International; other corporate and celebrity supporters	institutional advocates like the World Bank Forest Carbon	EPA, ED, WRI, NMBA, Environmental Trade Network, Great Lakes Protection Network, Chesapeake Bay Program, Willamette Partnership, Puget Sound Partnership, Officer of Environmental Markets, Foundations	Center for Conservation Incentives, RUPES, WWF, TNC		AUS: Conservation groups: Healthy Rivers Australia. US: Conservation groups and water trusts: PERC, Columbia Basin Wat Transactions Program, Trout Unlimited	Species : Environmental Defense, Defenders of Wildlife, IUCN,	from their projects' impacts on biodiversity; governments regulating			CBD, national governments, and international/local NGOs, International Co-operative Biodiversity Groups (ICBG), Edmonds Institute	Government: Fisheries management agencies or ministries; civil society: community groups, fisheries cooperatives, NGOS: environmental NGOs such as ED,TNC	above), World Wildlife Fund (WWF), Research Institute of Organic Agriculture (FiBL), Agro Eco Louis Bolk Institute, Grolink, Organic & Fairtrade Competence Center, Humanist Institute for Developmen Cooperation (HIVOS), Vredesilanden/VredesEilanden Country Offices (VECO), Inter-American Institute for Cooperation on Agriculture (IICA)	Programme for the Endorsement of Forest Certification, the certifying bodies themselves, etc. NGOs
CRITICS	Forestry Environmental Resource Network (FERN), Sinkwatch, REDD- Monitor	Forestry Environmental Resource Network (FERN), Sinkwatch, RED Monitor, various journalists, indigenous organizations	Greenpeace, Climate Action Network (CAN), Friends of the Earth, Forestry Environmental Resource Network (FERN), Sinkwatch, REDD Monitor, various journalists, indigenous organizations World Bank (through its Forest Carbon Partnership facility and	Water Watch	Not Available IFAD, GIZ	Anti-water privatization or anti-market folks, i.e. Friends of the Earth World Water Council, DANIDA, USAID, IFAD, The World Bank and	competition with agricultural water use; Anti water privatization folks: Fair Water Use Australia	d National Wildlife Federation, Chesapeake Bay Foundation, Sierra Club, Audubon Society, Greenpeace, Friends of the Earth, US General Services Office (GAO) RAMSAR, Convention on Biological Diversity, CITES, GEF, UNEP,	Earth, Indiginous Environmental Network, and others	Community groups, NGOs, analysts, scientists (disagreement with metrics defined by programs), participants (due to lack of clarity in process) All major development aid agencies could be involved, inlcuding	IFC, OECD, UNEP, WTO	Anti-privatization NGOs All multi and bi-lateral agencies (InterAmerican Development Bank	Civil society: fishermen, fishing cooperatives, NGOs for environmental conservation and social justice Mutlilateral and development agencies: UNDP, UNEP, the World	Various watchdog organizations (e.g., environmental and human rights) GEF, UNDP, UNEP, International Finance Corporation (IFC), United	Industry (don't like the transaction costs), critics arguing market bias against small and medium type enterprises.
MULTILATERAL/BILERATAL/DEVELOPMENT AGENCIES		Carbon Funds and Forest Carbon Partnership Facility), Netherlands European Carbon Fund, KfW Carbon Fund	Forest Investment Program), GEF, UN-REDD Programme. Bilaterals include several dozen REDD donor country public institutions (e.g., USAID, JICA, KfW)			other regional development banks.		World Bank, IFC	Diversity, GEF, World Bank, etc.	GEF, WB, UNDP, etc.		CBD, WTO)	Bank, FAO, and other regional and bilateral development aid organizations.	States Agency for International Development (USAID), World Bank Interamerican Development Bank (IDB), Commission for Environmental Cooperation (CEC), Swiss State Secretariat for Economic Affairs (SECO), FAO, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), EU	, certifying mills. All being subsidized
INVESTORS	Private Investors (e.g., Climate Change Capital, Generation Investments, etc.)	Private investors (e.g., Climate Change Capital, Generation Investments, Permian Global); carbon funds (Althelia Ecosphere, EKO, Livelihoods); corporate or retail offset buyers supporting earl stage project activities; insitutional REDD investors (e.g., IFC, Macquarie Bank)		Electricity Companies, Developers	Vivendi, Lyonnaise, etc.	Aqua America, Inc., Sustainable Asset Management water fund	None yet.	Private investment firms: MuniMae Sustainable Land Investments, Parthenon Capital, Ecosystem Investment Partners, New Forests, Equator Environmental, Lehman Brothers	Companies, growing interest from banks.	Governments. Sometimes private sector will also contribute funds.		Venture capital groups	Brokerage firms, banks and funds financing fishing operations	Traditional agricultural investors	Socially responsible investors in the US and Europe
PHILANTHROPIC INVESTORS		Corporate and institutional investors supporting early-stage project activities with intent to obtain and retire offsets; or as purely social impact investing		Joyce Foundation, GLPF	Bilaterals/Companies, NGOs (WWF)	TNC, World Bank, CI and other private foundations	AUS: Waterfind Environment Fund. US: National Fish & Wildlife Foundation	None known yet	All major foundations that focus on biodiversity, conservation NGOs, multilateral and bilateral cooperation agencies	NGOs, multi-lateral and bilateral institutions, private foundations			Foundations - Moore Foundation, Packard Foundation, Walton Foundation	Various	Donors giving assistance to groups like WWF GFTN, TFT, PROFOREST to get more producers and manufacturers certified.
TRADE ASSOCIATIONS	International Emissions Trading Association; International Forest Carbon Association; Climate Markets and Investors Association	International Emissions Trading Association; International Forest		Environmental Trading Network	Trade associations of water companies, Water Environment Fund		None yet		Research and interest from ICMM, IPIECA, and well attended fora in IAIA.	None	The International Ecotourism Society, World Tourism Organization, World Travel and Tourism Council	BIO (Biotechnology trade association), EuropaBio (European Association for Bioindustries)	Marine Stewardship Council, Sustainable Fish Partnership		All timber trade associations are involved in one wayor another. Uk timber trade federation.
MAJOR CONSULTANTS/BROKERAGES	UNIQUE Forestry and Land Use)	Small number of brokers (e.g., Armajaro); project consultants (e.g. SNV, UNIQUE Forestry and Land Use); corporate emissions consultants/offset retailers (e.g., The CarbonNeutral Company, Prometium Carbon, ClimateNeutral Group, Forest Carbon Group)	PricewaterhouseCoopers, SNV	PricewaterhouseCoopers (Australia), CH2MHill (consultants)	The Nature Conservancy (notably in partnership with The Coca-Cola Company)	Not Available	AUS: Buybacks generally carried out through government- administered reverse auctions or ad-hoc transactions. US: Mission Markets, BEF's Water Restoration Certificates	Tetra Tech, Parametrix, Wildlands, Biotope, etc	Environmental consultancies and land management companies such as New Forests have expressed interest. CI, TNC, WCS have been participating as consultants to companies	TNC, CI, WCS		Large biological, botanical research organizations: Kew Gardens, Missouri Botanical Gardens	NGO Consultants: EDF Catch Shares Design Center, EcoTrust; Brokers: FishServe, ACExchange, Aotearoa Quota Brokers Ltd.	Various	Forwood International
LAND MANAGEMENT SERVICE PROVIDERS	Private project owners; government landholdings; the World Bank	Private project owners; government landholdings	Domestic forestry agencies	Agricultural producers, technical support offered by the USA, American Farmland Trust	Nature preserves, land trusts, land users	Conservation trusts, nature preserves, land users	Not applicable	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 (e.g., US).	Local and national NGOs		none	N/A	N/A	Certifiers and technical assitance forestry consultants, Tropical Forest Trusts.
TECHNICAL SERVICE PROVIDERS	(assessment, monitoring, verification), Edinburgh Centre for Climate Management (project assessment & development,	development, measurement, reporting), Det Norske Veritas, TUV	(assessment, monitoring, verification), Edinburgh Centre for Climate Management (project assessment & development,	WRI's Nutrient Net, Registries such as APEX and Markit Environmental Registry, Mission Markets	FUNDECOR, hydrologists, other scientists, ICRAF, CGIAR group including CIFOR, CSIRO, PEMA (Tanzania), CSIRO - Center for Science Industrial Research (South Africa), IIED, CARE, TNC		Hydrologists and other scientists; State and national agencies (scientific data); National and state regulators; Conservation organizations: State water trusts; PERCAT Water, (AUS) Waterfind	engineering and construction firms (Parametrix, CH2MHill), wildlife	NGO intermediaries; university departments; government research	International NGOs; National NGOS - FUNBIO (Brazil), CONAM (Peru); government agencies - NSW DECCW (Australia); program participants, consulting companies	RARE Center for Tropical Conservation	Academic research organizations	NGO: EDF Catch Shares Design Center, EcoTrust; Governments: US NOAA National Marine Fisheries Service, New Zealand Ministry of Fisheries	Regulators and standard setters (certifying bodies), international organizations, development agencies, NGOs	Brinkman, Smartwood, SGS, PROFOREST, Tropical Forest Trusts, and many more creditied verifiers
(legal, monitoring, verification)	measurement, reporting), Det Norske Veritas, TUV Group, SGS (validation), various legal service providers. Brokers (e.g., Armajaro, Evolution Markets), consultants (e.g., Terra	Group, SGS (validation), various legal service providers. Brokers (e.g., Armajaro, Evolution Markets), consultants (e.g., Terr	measurement, reporting), Det Norske Veritas, TUV Group, SGS (validation), various legal service providers. Ta Development banks (e.g., World Bank Group) and financial firms	Watershed-specific arrangements	FUNDECOR, hydrologists, other scientists, ICRAF, CGIAR group	FUNDECOR, water trust funds, government agencies	(AUS) State and/or watershed-specific arrangements; Mission Markets'	Bonding companies, Comercial banks, insurance companies	Banks, investors, insurers	Government agencies	IFC		Banks may finance the purchase of quotas.	Various, e.g., World Bank, IFC, multilateral and bilateral	
FINANCIAL SERVICE PROVIDERS	Carbon, UNIQUE Forestry and Land Use), large NGOs (e.g., Conservation International, The Nature Conservancy), large banks (e.g., NedBank, Macquarie, BNP Paribas)	Carbon, UNIQUE Forestry and Land Use), large NGOs (e.g., Conservation International, The Nature Conservancy), large banks (e.g., NedBank, Macquarie, BNP Paribas)	(e.g., PricewaterhouseCoopers).		including CIFOR, CSIRO, PEMA (Tanzania), CSIRO - Center for Science Industrial Research (South Africa), IIED, CARE, TNC		crowdfunding platform	(financial assurance, letters of credit) Environmental science, environmental management, law,	Biologists hotanists zoologists tayonomists as their	Biologists, botanists, zoologists, taxonomists, ecologists,	Griffith University (Australia) International Castro for Torriginal Castro for Torrigina	Oregon State University / Dr. William Consists when	Key academics and information providers include James Sanchirico	development agencies Various, especially in the USA, e.g., Jowa State University, Cornell	Yale Global Institute of Sustainable Essector Duby No. 1
ACADEMICS	Alliance), CATIE (Costa Rica), CIFOR (Indonesia), ICRAF (Africa + global)	Alliance), CATIE (Costa Rica), CIFÓR (Indonesia), ICRAF (Africa + global)		trading; US EPA Office of Water staff for WQ trading; Kieser & Associates on WQ trading, Mark Kieser and Feng Fang; Mindy Selman and Cy Jones at WRI. David Letson at Univ of Miami on W trading and effects of climate on water resource mgmt.; Beth McGee at CBFon Bay restoration and water quality; G. Tracy Mehan at the Cadmus Group on WQ trading and Wetlands Restoration; Jessica Fox of EPRI on basin wide trading in the Ohio River Basin.	/Q	for Ecological and Environmental Économics Beijing; Forestry and Land Use, NRGroup, IIED, OECD, Mexico: Alejandro Guevara at Universidad Iberoamericana, Carlos Munoz at Instituto Nacional de Ecologia. Costa Rica: Stefano Pagiloa, World Bank; Katoomba Network in Africa and Latin America	(University of California, Santa Barbara); Sam McGlennon (Australian National University); Brandon Scarborough (PERC) le	carthography, hydrology, wildlife biologists, conservation biologists, MBA programs	anthropologists, economists, planners, lawyers	anthropologists, economists, planners, lawyers	Research; University of Colorado, Boulder: Leeds School of Business, Center for Sustainable Tourism		(UC Davis), Timothy Essington (University of Washington), Rod Fujita (EDF); FAO in Rome maintains the global database on fisheries and has commissioned a report on quota fisheries.	University, University of Minnesota, Washington State University, Colorado State, Kentucky State University, Duke University, Arizon State University, University of Arkansas	of the Environment; other forestry schools, etc.
INFORMATION PROVIDERS		Bloomberg New Energy Finance; Thomson Reuters Point Carbon;	REDD+ Partnership Database; Overseas Development Institute (Climate Funds Update); Forest Trends' REDD Expenditures Tracking Initiative (REDDX) and Ecosystem Marketplace; Global Canopy Programme (the REDD Desk); World Resources Institute; Institute for Global Environmental Strategies	Tech and Forest Trends via Ecosystem Marketplace	the state of the s	Flows (online), USA, USFS, EPA, Water Environment Federation, IIED, SIWI	AUS: Australian National Water Commission, PERCAT Water; US: National Bureau of Economic Research, PERC, West Water Research, State of Washington Department of Ecology	Ecosystem Marketplace, National Wetlands Letter, ELI publications, California Insider and state-wide regulatory publications, USACE - RIBITS, local papers, NatureServe, National Heritage, EPRI, USFWS, EIANZ, British Ecological Society	organisations. See http://bbop.forest-trends.org/	Government environmental agency news/websites; NGOs (Katoomba Group, Ecosystem Marketplace, WWF, TNC); multi- lateral websites and news bulletins	Journal of Sustainable Tourism, The International Ecotourism Society, Planeta.com	CRD	Multilaterals: FAO and World Bank; NGOs: TNC, EDF, Pew, RFF	ITC (www.intracen.org/organics; www.thecoffeeguide.org), FiBL (www.organic-world.net), FAO (www.fao.org/organicag), IFOAM (www.ifoam.org), Tropical Commodity Coalition (TCC), RSPO Market Center (www.rspo.eu), FAO Fisheries & Aquaculture Division (www.fao.org/fishery) , International Institute for Environment and Development (www.iied.org), International Institute for Sustainable Development (www.iisd.org)	Forestweb; Foresttrade Asia; Greenspec
EMERGING DEVELOPMENTS & STRATEGIES TO ADVANCE AND SCALE UP PAYMENTS AND TRANSACTIONS	maintain existing or future activities, resulting in stranded assets. Emerging national and sub-national programs (like California, Australia, Sao Paulo, Japan, Korea and others) are setting policies that could potentially increase demand for regional forest carbon and REDD	must be integrated with any post-2012 international climate policy's treatment of REDD+ to incentivize widespread adoption of REDD+ as a voluntary mechanism and expand the potential number of projects and project types for pre-compliance buyers. State and national governments need to devise new ways to incentivize investment in and demand for forest carbon credits, with attention to "carrots" (GHG reporting write-offs, tax credits, avenues for recognition) so that corporates can make a business case for forest carbon	mechanisms, countries should be encouraged to pursue them outside of the UNFCCC context. The longer-term sustainability of public financing to support REDD+ remains very uncertain. Public REDD+ funds should be used to set up an environement and institutional framework for responsible, fair, equitable and sustainable market payments for REDD+, as well as for the provision of transparent information about the flow of REDD Finance from donor to domestic institutions to REDD	point source pollution are needed to grow US regulatory based trading. In Australia, salinity trading in the Hunter River has been recognized as a success but it remains to be seen whether other projects will attempt to replicate this. Market infrastructure (standards and protocols, crediting platforms, and monitoring and verification approaches, etc. and support to share experience and synthesize best	collaboration to develop projects, frameworks, and IWS-friendly governance will be critical. Similarly, the development of useful standards, guidance and metrics for 'beyond the fence' watershed management has become a commonly cited need.	the problem of "reinventing the wheel" and high transaction costs. An active community of practice is needed help improve program and project design as well as policy, and lead to better ecological and social outcomes. Governments and to a lesser extent NGOs must act as 'first movers', helping to support the development of institutions, expertise, and market infrastructure supporting	transaction costs, and facilitate inter-sectoral (e.g., ag to urban) and cross-state/territory/province trading is critical to grow the trend towards purchase and retirement of water rights for conservation purposes. Increased focus on short-term leases appears to be the mospromising direction, offering both water rights holders and conservation interests great flexibility in responding to seasonal and spatial variations in flow regimes. It is unclear whether other very large-scale purchases of licenses.	now need assistance exploring how impact compensation policy might work best in their contexts Documentation and analyses of methodologies, standards, and policies from other examples are needed to inform effective new legal frameworks. Enforcement of existing regulations is critical to grow an maintain compliance markets. In addition clarification of policy might be necessary, such as was the case in 2008 with	methodologies and standards are needed to help grow the practice of biodiversity offsetting. For example, guidance developed by the Business and Biodiversity Offsets Programme (BBOP) was recently prominently referenced in the IFC's revised Performance Standard 6. Third-party policy on biodiversity no-net-loss or netgain (i.e., IFC PS6, Equator Bank requirements, and EIA best practices) can increase use of both voluntary and compliance offsets by clarifying the current best practice.	valuation studies and tools (TEEB, InVest, etc.) are important. Demonstrating the efficacy and efficiencies of PES frameworks and tools may increase government-mediated payments for biodiverstiy services by steering government spending on the 2020 CBD biodiversity goals, and a general movement in agricultural subsidies away from	opportuntiues to expand the consumer willingness to pay for ecological benefits, conservation, and restoration remain high. A third-party standard could relieve consumer confusion over the terms "eco-tourism" and "sustainable recreation" and increase the market share of eco-tourism, but this recurring discussion has so far	to Genetic Resources and the Fair and Equitable Sharing of Benefits will likely provide legal and regulatory certainty, and in turn increase industry confidence and spur cooperation between governments, indigenous groups, and industry. Improving technologies that reduces R&D expenditure is key to increased activity in the field of genetic resources and the associated conservation benefits. Encouraging sub-national law (Brazil's Acre SISA law) that recognizes traditional knowledge as an ecosystem	A model that might be good to replicate is environmental NGO-mediated purchase of leases or quotas that are subsequently leased back out with conservation requirements, as exemplified in the Central California trawl fishery buy-outs and resales with environmental conditions by TNC / ED.	e environmental impact of agricultural eco-certification schemes should be a high priority to ensure the credibilir of eco-labeled agricultural products and prevent a drop in consumer confidence and demand. This impact needs to begin to be demonstrated beyond the individual farm level and, ideally, at a landscape level. While demand is growing, particularly in developed countries, the cost of such certification and of producti of certified products (and thus prices to consumers) needs to be reduced to enable the demand for such	critical to achieving greater and more consistent government, industry, and demand for certified products. Transaction costs must be brought down to enable small to medium enterprises (SME) and community groups. Establishing technical and marketing support can help achive this. Policy incentives/disincentives, carbon co-verification, and the bioenergy market will help grow the certified forest products market, as has been the experience for
	activities. Meanwhile, significant expectations for REDD mean that there may be a surge in supply in near to medium term.	offset purchases. Complex "rules of the game" must continue to be clarified by creating consistent guidance for methodological guidance, transparency and audit processes under voluntary market standards such as VCS, CAR, ACR	us	Project design must be improved to provide water quality monitoring data to quantify environmental outcomes. Market size in the US shrank between 2009-2011, due to a mix of a slow economy, declining price of credits in some areas, and potential buyers choosing technological upgrade over trading (citing long term uncertainties around trading) Anecdotal evidence suggests markets are seeing some growth in 2012-2013 and beyond thanks largely to larger-scale new markets in the Chesapeake Bay and Ohio River basins coming online.	es es	watershed payments to attract subsequent private funding.	for retirement (like Australia's) will emerge. Increased trading is often identified as a response to	new US rules encouraging the use of mitigation credit banks rather than project specific mitigation and in lieu fee funds. Reducing start up and transaction costs through technical assistance and/or aggregation is important to allowing small	More spatial planning of conservation priorities and biodiversity offset potential at various scales is needed to improve integrated land use planning and decision-making			service can lead to economic incentives fro compensation of intellectual property rights.	Developing financing opportunities (e.g., loans) based on fishing quotas as an asset may help increase the uptak of ITQ markets. Beyond ITQ fisheries ther are tradable use and access rights	Increasing scrutiny of the carbon and water footprints of agricultural supply chains and measures by leading	