

Payments for Ecosystem Services: Market Profiles



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A COMPANION NARRATIVE:

This report is a narrative summary of information collected in the Ecosystem Marketplace's Payments for Ecosystem Services (PES) "Matrix" - a comprehensive spreadsheet database of defining market information. Because these markets are rapidly changing and growing, the PES Matrix is a living document that is under continual development. The findings and figures in this summary draw from the best and most recent available data.

FOREST TRENDS & THE ECOSYSTEM MARKETPLACE ACKNOWLEDGEMENTS:

This Primer is a true collaborative effort among staff from Forest Trends, the Ecosystem Marketplace and many contributing experts. We are grateful for the willingness of these experts to share their knowledge. This report has benefited enormously from their input.

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Introduction

Nathaniel Carroll and Michael Jenkins



Given their enormous impact on our daily lives, it's astounding that we don't pay more attention, or dollars, to ecosystem services. Ecosystems provide trillions of dollars in clean water, flood protection, fertile lands, clean air, pollination, disease control - to mention just a few. These services are essential to maintaining livable conditions and are delivered by the world's largest utilities. Far larger in value and scale than any electric, gas, or water utility could possibly dream of. And the infrastructure, or hard assets, that generate these services are simply: healthy ecosystems.

So how do we secure this enormously valuable infrastructure and its services? The same way we would electricity, potable water, or natural gas. We pay for it.

Currently we are paying very little, expecting a lot, and jeopardizing even more when it comes to the integrity of the earth's ecological infrastructure. Current global government expenditures on protected areas are estimated to be \$6.5 billion per year. This is a fraction of the estimated \$45 billion per year required to fully support conservation objectives. And of this \$6.5 billion per year, less than 12% is spent in developing countries (Balmford et al 2002). And yet still, these figures pale in comparison to the estimated annual value of the world's ecosystem services, \$16-54 trillion (Costanza et al 1997).

Fortunately, we are seeing efforts around the globe to devise systems to pay for ecosystem services. But these payments for ecosystem services (PES) are still emerging, changing rapidly, and spread out across geography and institutions. It can be challenging to get a clear sense of the big picture of these markets: What are the major markets for ecosystem services? How big are they? Who's involved? Where are they heading?

To map this PES landscape we researched the main PES and each of their sub-categories (compliant carbon forestry, voluntary carbon forestry, government-mediated watershed protection, compliant biodiversity offsets, among others) and their key characteristics (size, environmental impact, community impact, market participants and shapers, and emerging trends). To collect the information on such a broad spectrum of topics, we pulled together a team of authorities in PES. Each authority then performed interviews, literature searches, and web searches to collect information for a specific category of market.

The result of this research is a large spreadsheet showing each market and their defining characteristics side by side. This poster-sized chart is powerful way to view and think about PES markets. We've dubbed it "the Matrix." To create a more reader-friendly format for accessing this information we've split up the Matrix into 'market profiles' that are essentially executive summaries or narratives for each market. This portfolio of market profiles is presented in the following pages.

The markets for ecosystem services seem to fall into categories in a couple of ways. First, we find that the ecological commodities follow the popular grouping of: carbon, water, biodiversity, and bundled services. Carbon markets are generally those that reward the stewardship of an ecosystem's atmospheric regulation services. Water markets provide payments for nature's hydrological services. Biodiversity markets create an incentive to pay for the management and preservation biological processes as well as habitat and species. Bundled payments are ones in which a payment secures all or a combination of carbon, water, and biodiversity services. Bundled payments also include those in which the ecosystem service payment is built into the price of the product, such as certified timber or certified produce.

Second, most PES fall into one of three payment types: voluntary, compliant, or government-mediated. Compliant markets are driven by regulation and enforcement, similar to other pollutant trading markets. Voluntary markets are driven by ethical and/or business case motives. In many cases, the threat for future regulation also drives these markets. And government-mediated markets are publicly administered programs that use public funds to pay private landowners for the stewardship of ecosystem services on their property.

Of course, information on these markets is, in most cases, very limited and constantly changing. For this reason we've made the Matrix, and its accompanying narrative, living documents. Over the two-year life span of the Matrix, it has gone through at least 20 revisions. The Matrix draws on published data when possible, but sometimes it is necessary to estimate or extrapolate based on expert opinion and ancillary information.

The focus of this report is ecosystem-based markets, so other environmental markets were not included, such as non-forest carbon, water quantity trading, and renewable energy credit trading. In addition we chose not to cover a few markets that were not areas for principal focus for the Ecosystem Marketplace: recreation, certified forest products, and genetic resource/bioprospecting. These markets may be included in future revisions.

While much has been learned about successfully developing market mechanism to ensure the security of our natural infrastructure, we hope this collection of market profiles, and the Matrix itself, will help refine existing systems and spur new and creative solutions.

Market Profiles :: Carbon



Compliant Carbon Forestry

Katherine Hamilton & Sara Bushey

Market Description

The regulated, or compliant, carbon forestry market is driven by the need to comply with government regulation on carbon dioxide emissions. In regulated markets, policymakers set the caps at desired reduced level of emissions (presumably scientifically credible in terms of environmental stability), which sets a price for emission allowances. Participating entities can then trade emissions, giving them the most flexibility to achieve emissions reductions goals. According to the World Bank's carbon market report, "the key elements for well-functioning carbon markets include: competitive energy markets; common, fungible units of measure; standardized reporting protocols of emissions data; and transferability of assets across boundaries."

The regulated carbon forestry market consists of several components. Two segments entered into force under the Kyoto Protocol in 2005: the Clean Development Mechanism (CDM) and Joint Implementation (JI) projects. The CDM includes emission reduction projects in Non-Annex I countries that generate tradable carbon credits and which only counts afforestation and reforestation projects. JI includes emission reduction projects in Annex I countries. The future viability of these market components will be very dependent on post-Kyoto treatment of Reducing Emissions from Deforestation and Degradation (REDD), which meeting in Bali decided to include under CDM.

In Australia, the New South Wales GHG Abatement Scheme (NSW), was established in 2003 only includes forests that "have been 'human-induced', through activities like direct seeding and planting." Regional Greenhouse Gas Inventory, which includes 10 Northeast and mid-Atlantic U.S. states, is a regional cap-and-trade program that initially covers only CO₂ emissions from power plants.

Market Size

Agro-Forestry projects currently account for <1% of all asset classes (project areas) in both the CDM and JI. According to EcoSecurities, •€3.9 billion/\$5 billion was traded through the CDM in 2006 (www.bfn.de/fileadmin/MDB/documents/ina/vortraege/21_sabine_henders.pdf).

The New South Wales GHG Abatement Scheme generated \$558,558 in 2006. RGGI is not yet operational (2009).

The regulated forest carbon market did not have significant growth in 2006. However, general carbon market growth was a 221%. The EU ETS trading volume increased between 2005- 2006, however, thus far this number does not include any forestry projects. The NSW increased 176.8% between 2005 and the third quarter of 2006. Market analysts project that the potential size of the regulated carbon forestry market will be; by 2010, \$10 million- 2 billion; by 2020, \$5 million- 5 billion, and; by 2050, \$0 - 5 billion.

Developing World Impact

Thus far in the regulated market, the majority of investments in carbon forestry projects have been located in developing countries (which is a requirement under the CDM): For example, China had the first forestry project to be registered under CDM – the Pearl River Basin in Guangxi province. It is estimated to produce 400,000 CERs by 2017 and a further 600,000 by 2050. Overall in 2006, developing countries were responsible for nearly 450 MtCO_{2e} of primary CDM credits (not solely forestry-related projects), representing approximately a total market value of US\$5 billion. This reflects the large potential for economic opportunities and revenue generation for local communities and regions in developing nations from regulated carbon forestry and other market-based projects.

Environmental Impact

The environmental impact of regulated carbon markets is currently quite low. However, as the market grows and may potentially add REDD, the potential for environmental benefits is quite large. As (native) forest areas are restored and/or protected, land is conserved, watersheds and biodiversity protected, and non-timber forest products can be retained. However, current land conservation values are low, despite the potential for high compensation rates for land conservation in the future.

Market Players

Participants:

In the regulated carbon forestry market, the core participants are the buyers (e.g.: regulated industry, governments, carbon funds, investors) and sellers (e.g. project developers, retailers, brokers, land-owners, stewards). Examples of sellers are Precious Woods (forestry related CDM), the Pearl River project developers (State Forestry Administration, Research Institute of Forest Ecology, Environment and Protection Chinese Academy of Forestry, International Bank for Reconstruction and Development/ Bio Carbon Fund), and the World Bank.

Shapers:

Entities that share the regulated market are the regulators or those that set the standard, such as the 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); and RGGI (for RGGI states). Along this vein, policy-makers play a large role, including member governments (for

Kyoto), state government of NSW (for NSW), local country governments, and non-governmental organizations (NGOs). Advocates and critics of such regulated systems as help form the debate, including NGOs on both sides). Multi- and bi-lateral institutions, such as the World Bank, Netherlands European Carbon Fund, and Asian Development Bank, are integral to the regulated market.

Investors play a large role as project developers (ex. EcoSecurities, AgCert); brokers (ex. CO2e); general investors (ex. Cheyne Capital Fund; Climate Change Capital; Generation Investments etc.), as do trade associations, consultancies, and brokers.

Service Providers:

Technical service providers provide expertise on legal, monitoring, verification, project assessment and development, reporting, and marketing. Winrock International, for example, specializes in assessment, monitoring, and verification. EcoSecurities does project assessment and development, reporting, and marketing). DNV focuses on validation, whereas Baker & McKenzie provides legal services.

Financial services are another important area in the regulated carbon forestry market. There are brokers, such as Natsource and Evolution Markets, as well as consultancies (e.g. EcoSecurities, Baker & McKenzie) that provide these services. Also, large NGOs, like Conservation International and The Nature Conservancy, and large banks, like HSBC, and Climate Change Capital, do as well.

Academic institutions also provide research and other information (e.g. Bristol Univ., CATIE in Costa Rica, and CIFOR in Indonesia). There are also other information providers that focus on the carbon market, including Point Carbon, Environmental Finance, Evolution Markets, and Ecosystem Marketplace

Emerging Issues

Forthcoming decisions made by the global community on international rules, regulations, and standards for a post-Kyoto climate change framework, which is likely to include REDD policies. This framework will greatly dictate the degree of growth and flexibility in the regulated carbon forestry markets. This should also engender changes in current markets and market methodologies to better accept and foster forestry-based carbon projects.

Also, the United States is anticipating climate legislation to be advanced in the Senate that would be a large step toward establishing a national regulated cap and trade system. Of the numerous climate-based bills currently floating around in Congress, the Lieberman-Warner bill, the Climate Security Act, has garnered the most support in the Senate. This bill is thought to reduce U.S. greenhouse gas emissions by 63% by 2050.

As national legislation creeps toward consensus, numerous U.S. states have meanwhile created, and some already implemented, regional greenhouse gas cap and trade schemes in order to get a head start on working collaborate to reduce GHG emissions. The Regional Greenhouse Gas Initiative, representing 10 northeast states, and the Western Climate Initiative, an emerging regional coalition that includes six western states and two Canadian provinces (British Columbia and Manitoba, are examples of such state-driven efforts on climate change.

Sources

- 2006 data from World Bank. "State of the Carbon Markets."

- Ecosystem Marketplace/ New Carbon Finance. "Picking Up Steam: State of the Voluntary Carbon Markets 2007";
- EcoSecurities. Compliance Carbon markets –a way to finance PES while linking the Rio Conventions? Seminar on Conservation Finance, 2007. Sabine Henders

Voluntary Carbon Forestry

Katherine Hamilton & Sara Bushey

Market Description

Unlike the compliance, or regulated, carbon market, the voluntary carbon market is driven primarily by buyers that participate for a variety of reasons but do so voluntarily, without external mandates or regulations forcing participation. The incentives for businesses or other organizations to participate as buyers in the voluntary carbon market could be that it is viewed as a good corporate responsibility, a positive public relations strategy, or good preparation for a future regulated market. Also, individuals can buy these credits to take personal responsibility for their individual carbon footprints.

On the supply side, the number of entities supplying carbon credits into the voluntary market has grown by 200% since 2002. Online retailers are responsible for a large part of that growth. A year of significant growth, 2006 introduced many new voluntary market retailers, brokers, and other actors.

There is a range of sub-markets within the voluntary market, ranging from legally-binding exchanges (Chicago Climate Exchange), to retailers (Carbon Fund), and non-governmental organization initiatives (The Nature Conservancy in Bolivia; Carbon Pool, Conservation International, etc.). Also, the voluntary market also includes verified emissions reductions (VERs) generated from pre-CDM projects (projects that are in the pipeline to become CDM projects but have yet to be approved by the Executive Board).

Market Size

The size of the voluntary carbon market was approximated to be more than \$21 million in 2006. The current rate of growth for the voluntary carbon market is quite astounding. Overall, the voluntary market increased rapidly by an estimated 200% between 2005 and 2006. For example, the general CCX market trading volume increased by 700% between 2005 and 2006 and grew 100% between 2006 and 2007. The ratio of credits in voluntary market supplied by Land Use and Land Use Change and Forestry (LULUCF) decreased but the volume continues to rise. Specifically, the percentage of forestry credits sold on CCX decreased between 2006 and 2007.

Like the compliance market, development of the voluntary market will depend largely on post- Kyoto treatment of Reducing Emissions from Deforestation and Degradation (REDD) and how many economies will transition to nationally-regulated markets. An ICF report estimated that in 2010 the entire voluntary market to reach 400 metric tons of carbon dioxide equivalent. It is estimated that the potential size of the voluntary market will be \$15 million to 1 billion by 2010 (in \$ per annum); \$10 million to 5 billion by 2020, and; \$10 million to 5 billion in 2050.

Developing World Impact

An overwhelming number of credit-generating projects within the voluntary carbon market are based in developing nations, approximately 70%. There exists a large potential for growth in LULUCF and REDD

projects in developing countries for voluntary markets. Market analysts predict that the potential size of the voluntary market component in developing countries in 2020 could be (in \$ per annum) \$500 million-2 billion in the market overall, with \$50- 250 million coming from LULUCF projects.

Environmental Impact

The environmental impact of voluntary carbon markets is currently quite low; however, as the market continues to grow, the potential for positive environmental impacts is quite high. As forest-based projects restore and/or protect (native) forests, land is conserved, watersheds and biodiversity protected, and non-timber forest products can be retained. Current land conservation values are however currently low, despite the potential for high compensation rates for land conservation in the future. The potential ability of forest carbon projects involved in the voluntary market to protect forests under threat is quite high.

Market Players

Participants

In the voluntary carbon forestry market, a large majority of participants are buyers (e.g.: corporations, NGOs, Universities, retailers, and individuals) and sellers (e.g. retailers, brokers, project developers, governments, land-owners, stewards). Examples of buyers include Mitsubishi, AEP, Cinergy, GM, Texaco, and Yale University. Examples of sellers are retailers like Go Zero, EAD Environmental, Climate Care and project developers like TNC, CI and Pre- CDM VERs. Also, farmers, local communities (including indigenous groups/tribes), and public agencies (state and national government landowners) sell credits to the voluntary market.

Shapers

There are many players within the voluntary carbon market that significantly influence it. These players include regulators and standard setters, such as CCBA, CCAR, CCX board and UK DEFRA (potential "code of best practice" for retailers). Policy makers help develop the market and include CCX members, NGOs (Climate Group, WRI, Environmental Defense), and organizations involved in verification standards (ex. DEFRA, Climate Group, CCBA). Advocates include NGOs (such as American Forests, Pacific Forest Trust, and Ducks Unlimited), corporations, and celebrities. Critics include other NGOs (like Greenpeace, Climate Action Network, Friends of the Earth, Forestry Environmental Resource Network, Sinkwatch) and various journalists. Both sides partake in framing discussion and debate about the voluntary carbon market.

Investors play a large role in shaping the market as well. There are a range of general investors (Climate Change Capital, Cheyne Capital), project development investors (Ag Cert, EcoSecurities), brokers (Evolution Markets), and final sellers (Carbon Fund). Philanthropic investors, such as FACE Foundation (Dutch), Prima Klima (German NGO), and Care International also are important factors in market development.

Development agencies, like the World Bank and the GEF (supported by the World Bank, UNEP, UNDP), all contribute to shaping the market, as do trade associations such as the National Carbon Offset Coalition and INCS.

Last, but certainly not least, are the major consultants and brokers. There is an extremely broad range of providers and services in this category, including CO2e, Evolution Markets, Natsource, EcoSecurities, and ICF.

Service Providers

Many different types of service providers are important voluntary carbon market participants. Land management service providers include NGOs (TNC), forestry companies (New Forests), and national governments (Costa Rica). Technical providers vary from Winrock International (legal, monitoring, verification), the Edinburgh Centre for Climate Management (assessment, monitoring, verification), and EcoSecurities (project assessment & development, measurement, reporting).

Financial service providers are integral to the market. They can come in the form of brokers (Natsource and Evolution Markets), consultants (EcoSecurities, Baker & McKenzie), large NGOs (CI, TNC), and retailers (Future Forests and Green Fleet).

Academic institutions also provide important research and other information – institutions such as Bristol University, CATIE in Costa Rica, and ICRAF (Africa + global). Also essential to spread information about the voluntary carbon market are information providers such as Ecosystem Marketplace, Point Carbon, and Carbon Positive.

Emerging Issues

The prospect of having an international post-Kyoto policy on REDD, even within the regulated market context, will greatly affect the voluntary carbon market. The demand for and supply of REDD projects would both shift significantly, thus causing much uncertainty in the voluntary market.

Also, as the United States anticipates climate legislation to be advanced in the next couple of years, more potentially-regulated entities will likely take steps toward preparing for carbon regulation, which may engender continued rapid growth of voluntary market participation. Of the numerous climate-based bills currently floating around in Congress, the Lieberman-Warner bill, the Climate Security Act, has garnered the most support in the Senate. This bill purports to reduce U.S. greenhouse gas emissions by 63% by 2050.

Market Profiles :: Water



Compliant Water Quality Trading

Tracy Stanton

Market Description

Compliant Water Quality Trading markets are characterized by government implementation of a regulatory limit or cap on the amount of degradation or pollution permitted in a given area. Such cap-and-trade models create highly favorable conditions for a market to thrive. Once launched, government maintains limited involvement generally by providing policy guidance and enforcement.

Examples of such programs include The Hunter River Salinity Trading Scheme in New South Wales, Australia; Canada's South Nation Total Phosphorus Management Trading Program and Pennsylvania's Water Quality Trading Program. In the Hunter River Basin, the government established a load-based licensing scheme which set limits on pollutant loads emitted by holders of environment protection licenses. In addition, there was a Total Allowable Discharge cap (not unlike TMDL limits) set for the entire basin. That cap translated into 1000 credits which established the mechanisms that allowed trading among the dischargers. This compliance-based scheme provides the driver for the trading market without which there would be little incentive to participate.

Market Size

According to the Katoomba Group's Ecosystem Marketplace, the total size of the actively trading water markets (1994 – 2005) totaled US\$373,655,115.¹ This figure also includes a number of Government-Mediated Watershed PES schemes. The market size (defined by total value of transactions) in Compliant Water Quality Trading is estimated at \$15 million. The World Resources Institute's 2007 research on

¹ From the Katoomba Group's Ecosystem Marketplace website:
http://ecosystemmarketplace.com/pages/marketwatch.segment_landing.php?component_class_name_csv=water_market

water quality trading programs identified 21 active programs within the US and 11 inactive programs. The same survey found four international programs; two are active, one is in development and one is no longer in operation.² The players in this market continue to ebb and flow with some players showing no activity since 2005 while others are poised to jump in (WRI's survey noted 17 pilot programs currently in the process of developing trading programs-16 in the US and one in New Zealand). The potential size of the market by 2010 depends in large part on the implementation of provisions in the 2007 US Farm Bill and the success of those schemes now in development. Regardless, the size by 2010 is estimated at over \$500 million.

Developing World Impact

Markets in developing countries are not as robust as in the US given the lack of regulatory and enforcement infrastructures and are difficult to estimate in both size and volume. As the focus on water quality gains momentum worldwide, the potential of these markets will increase.

Environmental Impact

Quantifying the environmental benefit is one of the greatest challenges of these payment schemes. The most successful PES programs are those with built-in evaluation mechanisms. PES schemes must be able to demonstrate the environmental result that will occur by engaging in the PES activity (i.e., improved or restored water quality). Many of the current programs are not designed to demonstrate their intended environmental improvement. Future programs should make this a priority. The State of Connecticut's Long Island Sound Nitrogen Credit Exchange program recently was awarded EPA's first Blue Ribbon Water Quality Trading Award. According to officials at EPA, the program is one of the few active trading programs that are able to demonstrate real environmental improvement.

Market Players

Market participants are comprised of buyers such as those who own waste water treatment plants, and other industrial point sources and potentially government buyers through reverse auctions. Sellers represent the non-point source emitters such as farmers, owners of waterways, streams and wetland developers. Sellers may also include residential emitters and other land owners or managers.

Those shaping the market include:

- regulators or those setting standards such as federal and state level environment and natural resource protection agencies, regional watershed agencies and state water boards;
- policy makers at the federal, state and local level;
- advocacy groups such as Environmental Defense, WRI, NMBA, and the Environmental Trade Network;
- critics such as those representing farming interests or some industrial producers;
- multilateral institutions such as the World Bank and other regional banks under the World Bank umbrella, and development agencies such as UNEP and USAID.

Market Service Providers are represented by investors motivated by profit or philanthropic interests; trade associations such as the Environmental Trading Network; consultants or brokerage firms, technical service providers, financial service providers such as Red Barn Trading in the case of Pennsylvania's Trading Program; academic and other information providers such as Flows, Water Strategist, Carnegie

² Overview of Water Quality Trading Programs (draft report), World Resources Institute, Washington, DC, June 2007.

Institute at Dartmouth, the Environmental Law Institute, the Katoomba Group's Ecosystem Marketplace and Government advocates such as EPA.

Emerging Issues

Given the reluctance and/or inability to adapt existing regulatory structures to address non-point sources, [which remain largely unregulated], there is a pressing need to develop market drivers outside the framework of existing government regulatory schemes; in other words, totally private markets.

Voluntary Watershed Management Payments

Tracy Stanton

Market Description

Voluntary markets are markets in which buyers and sellers engage in transactions on a voluntary basis (i.e. not because they are forced to trade by regulation or in order to meet a mandatory cap). Generally businesses and/or individual consumers engage in voluntary markets for reasons of philanthropy, risk management and/or in preparation for participation in a regulatory market. The payments are structured to allow an increase in pollution at one point if it is reduced elsewhere (either on-site or off-site).

To date several beverage companies such as Vittel, Coca-Cola and a few semi private utilities in Costa Rica and Ecuador have generated voluntary payment schemes.

Market Size

The market size was originally estimated at \$5 million and no new information was found to inform a new estimate. The potential in the developing world is strong as the connection between the profits of private interests and water quality are further internalized, as demonstrated by the Vittel payment scheme.

Market Players

Market participants will continue to be dominated by private or semi-private entities (who rely on water quality in their production process) and the private land owners, forest companies and local communities in a position to affect the quality of ecosystem services. Those shaping and servicing these voluntary schemes are mostly philanthropic investors such as the World Wildlife Federation and trade associations for water companies. Technical service providers play a critical role in providing the science linking ecosystem services to land use.

Emerging Issues

Future voluntary payment schemes may be affected by the growing trend of private interests calculating their environmental impact. This is most commonly seen for carbon emissions but with the global lens focusing increasingly on water quality, there may be more voluntary payment schemes on the horizon.

Government-Mediated Watershed PES

Tracy Stanton

Market Description

In a government-mediated scheme, the government makes payments directly to providers of ecosystem services. This form of payment for ecosystem services is the most common, and thus the most robust, with governments around the world paying rural landowners to steward their land in ways that will generate or preserve ecosystem services. The government collects money from taxes or some other methods and then distributes it according to the program specifications. The Conservation Reserve Program in the United States, for instance, pays out over US\$1.5 billion to farmers each year in exchange for their protection of endangered wildlife habitat, open space and/or wetlands.

Market Size

The market size for direct government payments is currently estimated at over 5 billion dollars per year with China providing the largest sums estimated at over 4 billion. In the US, as mentioned above, over US\$1.5 billion goes to farmers each year in exchange for their protection of critical habitat, open space and/or wetlands. New York City provided nearly \$150 million to protect their drinking water source in the Catskills Mountains. In the developing world, both Mexico and Costa Rica have well established payment schemes totaling nearly \$20 million. In South Africa, direct payments for water-related ecosystem services is estimated at \$65 million.

Developing World Impact

The potential in developing countries is great given the increasing focus on water quality globally and the reported cost-savings associated with direct payments. In China alone, it is estimated that direct payments will exceed \$43 billion by 2020.

Environmental Impact

The Environmental Impact of government payment schemes is higher compared with the gains expected from compliant trading programs. This may be attributed largely to the sheer size of the subsidies going to those providing ecosystem services. In general, when recipients of payments incorporate monitoring mechanisms into the scope of the program, the environmental impact is likely to be easier to quantify.

Market Players

Market participants include mainly government entities representing water or agricultural interests and both private and public utilities. The sellers or recipients of these direct payments are private land owners, forest companies, large land interests such as national parks and land cooperatives, local governments and upstream communities.

The Market Shapers include among the following:

- Regulators such as USDA, Forest Agencies, Water, Environment and Natural Resource Agencies and Federal, State, Regional/District government agencies in other countries;
- Policy makers at all levels of government including those representing interests of many countries, such as the EU and within international treaties;

- Advocacy groups such as the Nature Conservancy, Conservation International and regional and local conservation groups;
- Multilateral/Bilateral Development interests such as World Water Council, DANIDA, USAID, the World Bank and IFAD.

Market Service Providers are represented by investors such as AQUA America, Inc a publicly traded water utility based in PA; Philanthropic investors such as the TNC, the World Bank, Conservation International and other private foundations; technical assistance and information providers such as FLOWS, USDA, and the Water Environment Federation.

Emerging Issues

Emerging Issues that may shape the future market are similar to those influencing the compliant trading programs; increasing global concern for water quality and overall loss of vital ecosystem services will force governments to find new ways to pay for these services.

Key Resources

- U.S. Environmental Protection Agency Water Quality Trading Program: <http://www.epa.gov/waterqualitytrading>
- Overview of Water Quality Trading (draft report), World Resources Institute, June 2007.
- WRI's website: <http://www.wri.org/>
- Katoomba Group's Ecosystem Marketplace: <http://ecosystemmarketplace.com/index.php>
- Individual programmatic websites at USDA's NRCS: <http://www.nrcs.usda.gov/programs/>
- Other individual programmatic websites.

Market Profiles :: Biodiversity



Compliant Biodiversity Offsets

Nathaniel Carroll

Market Description

Regulated biodiversity offsets are happening around the globe, in a variety of shapes and sizes. The United States environmental mitigation market is probably the largest to date. But there are markets in other countries. Australia has a number of fledgling programs that are quite sophisticated. The European Union has legislation (Birds and Habitats Directive) requiring environmental offsets for impact to their protected area system. Brazil has at least one government program that requires environmental compensation. And while details are few, it is reported that Colombia, South Africa, Uganda, Holland, and Switzerland, all also have legal mechanisms that require offsetting. There are also a number of countries that are actively considering such programs, such as France and Mexico.

In addition to enabling government legislation, Environmental Impact Assessments (EIA) around the world can provide a sort of compliance framework for biodiversity offsets.

Regulated, or compliant, biodiversity offsets are a category of ecosystem service payments that are driven by the need to comply with government regulation. In these markets, when a business, government, or individual impacts protected biodiversity they are required to compensate for the damage to the environment. This regulation can be national, state, or local, and perhaps eventually international. This market is in contrast to voluntary biodiversity offsets which are performed for business risk and/or ethical reasons.

There is far more information on the US mitigation banking market available than the other regulated biodiversity markets at this time. As a result the following market profile draws heavily on US

information. While incomplete of the global markets, the US market is a prototype for these schemes and has, in fact, been a reference point for other country's mitigation credit programs.

Market Size

The total size of all known regulated biodiversity offsets is roughly \$3.4 billion dollars. That is the dollar amount of all transactions per year. This estimate draws mainly from the US mitigation markets: \$3 billion per annum for wetland and stream mitigation, and \$370 million in endangered species mitigation (ELI 2007). Very little is currently known about the market size and transactions of other regulated biodiversity offset programs.

This market has potential to grow significantly if takes root in other countries and continues to be successful in the US. Given current strong growth in the US and recent adoption in Australia, the market could grow to 4.5 billion by 2010 and even \$10 billion by 2020.

Developing World Impact

The positive impact of regulated biodiversity markets in the developing world depends greatly on state and local governance and capacity. These offsets require a strong regulatory system and will likely be limited to developing countries with robust legal and regulatory systems. Voluntary offsets and those done in response to an EIA are likely to gain a foot hold in the developing country before regulated offsets do.

Environmental Impact

The environmental impact of regulated biodiversity markets is currently moderate. The land secured as compensation is often of high environmental value, but the system is based on a goal of no net loss. In other words, the driver for the market is habitat destruction and currently the goal is only to replace what is lost. This could change dramatically if the goal was changed to be a net gain. If compensation ratios were increased to require a net gain of 10 or 20 times what is lost, the environmental power of the market could be significant.

Market Players

In this market, the buyers of biodiversity offsets are anyone required to comply with biodiversity mitigation laws: real estate developers, federal and state agencies, utilities, and the military. The sellers include anyone possessing suitable habitat (wetland, disturbed wetland, or endangered species habitat) that is currently unprotected. This means that government land generally cannot be sold as mitigation because it is already considered to be safeguarded by the government. The regulators of these markets can be at the national level, state level, and/or local level. In some cases, such as California, you have both national and state regulation requiring biodiversity offsets.

The shapers of this market are the policy makers in the various levels of government, the advocacy groups, industry groups, and critics (environmental, land use, and other non-governmental organizations). The service providers include trade associations (such as the National Mitigation Banking Association), investors, consultants, academics, and information services such as the Ecosystem Marketplace.

Future Developments

This market is still very much in its infancy. One of the factors that will shape the US mitigation market is the new regulations announced in early 2008. These rules encourage the use of mitigation credit banks rather than project specific mitigation and in lieu fee funds and likely strengthen the demand for habitat mitigation in general. Other forms of creating and selling ecosystem credits, such as species recovery credits (USFWS, Ft Hood), will also impact the industry's development.

Australia has active biodiversity offset programs two states (New South Wales and Victoria) and less developed schemes in all other states. Additionally, the New South Wales program, BioBanking, is currently being considered for use at a national scale. While things are just getting off the ground in Australia and transaction volume is low, this market could take off rapidly and eventually catch up to the US market. But the programs must be field proven and accepted by the public.

On the international frontier, a global framework for regulated biodiversity offsets is not like to happen soon. In large part because of the nature of the commodity - species and habitat are most often local. What is likely to happen sooner is a set of internationally accepted principals and guidelines for voluntary biodiversity offsets (see voluntary biodiversity offsets profile). This could eventually spark more locally-regulated biodiversity offsets markets.

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Voluntary Biodiversity Offsets

Kerry ten Kate and Patrick Maguire

The Challenge

Biodiversity offsets can be defined as measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented. Their goal is to achieve no net loss, or preferably a net gain, of biodiversity. However, biodiversity is effectively the ultimate anti-commodity. Biodiversity offsets themselves are relatively new. The definition of biodiversity offsets, the metrics used to quantify them, the circumstances in which they are used, and whether they can be ‘traded’ or assigned to third parties vary considerably in different settings. All these issues are still under discussion and approaches are evolving rapidly around the world. Therefore it is a leap to regard them as a “market” and summarizing the status of this “market” quite challenging. In fact, the estimated size and growth rate of voluntary biodiversity offsets offered here can be offered only as an educated guess.

There is currently little regulatory requirement for biodiversity offsets around the world, limited, we believe, to just over 30 countries. This means that much of the experience worldwide has emerged from mitigation banking in the United States, from the European Union, Australia, Brazil and a few other countries, or from environmental impact assessments and planning processes, as well as the voluntary enthusiasm of particular individuals. With voluntary biodiversity offsets, experience is developing from the bottom-up. The most comprehensive survey of biodiversity offsets conducted to date was completed three years ago, and in fact, was the progenitor of the Business and Biodiversity Offsets Program. The size of the voluntary biodiversity offset market is especially difficult to pinpoint given that it is, by definition, a series of one-off transactions that are not widely communicated in the public domain, and is not a “market” at all.

A significant challenge to quantifying the extent of biodiversity offsets lies in the fact that offsets fall within a very broad spectrum that ranges from one-off voluntary offsets designed to compensate for the residual damage of one particular project, through more regular voluntary offsets that are required by company policy, all the way to legally mandated compulsory offsets. In many countries, legal processes for environmental impact assessment, planning and negotiation of the terms and conditions of concession agreements offer the context for discussions between regulators and companies to establish biodiversity offsets. Similarly, companies seeking to raise capital for development projects are likely to face requirements to establish mitigation measures – some of which include off-site biodiversity offsets – in loan agreements from the IFC, and, since the advent of the Equator Principles, from a number of private banks. Although the estimates provided here focus strictly on “voluntary” biodiversity offsets, what qualifies as voluntary as noted above and described further below is open to interpretation.

Methodology

The estimates provided here do not take into account the regulated markets (eg US, EU, Brazil, and Australia). Companies have tended to conduct voluntary one-off transactions only for large projects, of which there are perhaps only 20 starting each year in the extractive industry sector, of which perhaps 10 have any kind of compensatory conservation that goes beyond basic mitigation (some steps required by the regulator to lessen impact). So perhaps three to four (maximum) plan some kind of biodiversity

offset, with an estimated maximum investment level of US \$500,000, which could in fact be substantially less. We therefore estimate that 'true' biodiversity offset per annum figures that aren't linked to credit conditions are around US \$2 million annually and almost certainly less than US \$5 million a year.

In addition, 51 banks have subscribed to the Equator Principles. Their clients will invest in conservation as part of their loan conditions when required to do so to comply with the Principles. The ceiling for projects to which subscribing banks must apply the Equator Principles is now reduced to US \$10 million. Most of these projects will involve basic mitigation, but there will be a subset of investments in 'critical' and 'natural' habitat that require biodiversity offsets. However, it is difficult to measure the volume of such transactions. There is no coordinating Equator bank body, so in order to assess the level of investment made by the 51 subscribing Equator banks in biodiversity offsets, it would be necessary to speak to each of them separately (it is fairly unlikely that each bank would hold centralized data). We assume one third of the banks each have two projects a year that meet this threshold, and that one of these is dealt with through some sort of biodiversity offset. Adding these Equator bank transactions, each valued at an estimated US \$1 million, would be an additional US\$17 million per year. This is highly speculative and informal feedback to date has suggested that it is likely to be an overestimate.

Future Direction

There is evidence to suggest that the use of biodiversity offsets as part of development projects is increasingly accepted as best practice by governments, companies and NGOs, however it is unlikely that significantly more countries will introduce comprehensive regulatory requirements by 2010. Volume of transactions might increase modestly by that time, but not dramatically. New areas to explore to promote the uptake of voluntary biodiversity offsets include:

- developing broadly accepted standards for biodiversity offsets;
- working with policy makers to build these standards into existing and new policies and procedures;
- exploring potential certification and verification systems for biodiversity offsets;
- helping catalyze broader international use of eco-regional and landscape-scale planning in biodiversity offset design, and aggregated offsets (where several offsets are planned together);
- contributing to good practice in biodiversity offsets to emerging conservation banking and national biodiversity credit schemes, and;
- exploring methodologies for offsetting impacts to biodiversity caused by companies' supply chains.

Government-Mediated Biodiversity PES

Rachel Miller, Lauren de la Loya and Carina Bracer

Market Description

Government mediated biodiversity PES schemes cover a wide variety of types of programs, with various foci across programs including conservation of species specific habitat, payments to enhance ecosystem services and conservation, reforestation, etc. Our summary is representative of the information that exists but does not yet include statistics on every government mediated biodiversity PES scheme that exists. Gaps exist, specifically in projects funded by state run utilities and newer, less well established debt for nature programs.

Methodology

In order to undertake as accurate as possible scoping study on existing government-mediated biodiversity PES, a much larger project-specific matrix was completed with specific information on over 35 programs and projects. Thus, much of our analysis for the final matrix is a result of our work with the project specific matrix and is a source for much of our information.

After clarifying the categories of programs to be covered under “government biodiversity programs”, we researched all the programs that fit into this classification around the world. Sources for our research include primarily indirect sources from Government websites and laws, collaborating partner websites, articles and publications, multi-lateral agency statistics, and program specific websites. Details for each program were tracked in our biodiversity matrix, keeping notes of key gaps before proceeding onto data analysis.

Overestimates in the analysis are possible since a majority of programs are not exclusively focused on biodiversity, and the breakdown of funds applied within programs is not always specified in the literature.

Data Analysis Methodology:

- For Market Size and Developing World Impact, we summarized volume of programs, trends to future, etc.
- For cells on market participants, shapers and service providers, we compiled all the actors that tended to appear in the cells.
- For the environmental benefit matrix, we grouped the programs first by major submarket, then took the average of the value for each parameter within each submarket group. The number that appears in the matrix is the average of all the subgroups.

Market Size

The market for government mediated biodiversity PES is approximate \$3 Billion dollars. In depth data allowed us to gather specific budgetary figures for the programs. We anticipate the market will grow to \$4 billion by 2010, to \$7 billion by 2020, and to \$15 billion by 2050. This represents a growth rate of 3.5% per annum. This rate is slightly less than the growth that has taken place in the past year. We have estimated the market size based on our research of existing programs and the amount available funding

per annum for conservation goals; we estimate a deviation of +/- 10% to compensate for programs that are not included in this analysis.

Developing World Impact

There has been a significant increase in the market size in developing countries, increasing from an estimated \$40 million to \$190 million. This significant increase demonstrates the huge potential for growth in these markets in developing countries. In addition, Debt for Nature programs, where lender countries forgive a percentage of debt of the debtor country (typically developing countries), and in turn, the amount of debt that has been forgiven is used for conservation activities are gaining traction and are increasingly seen as acceptable to lender countries as an efficient utilization of monetary debt. Though we have included several large and well established Debt for Nature programs in our analysis, additional programs exist which we have not included due to a lack of reliable data. Additional potential in developing countries may come with increased use of the practice to charge national/state run utilities, and private sector actors for biodiversity conservation, which could potentially contribute additional funds to conservation activities.

Environmental Impact

Much of the data specific to gauging the positive potential biodiversity conserve impact was not available during this first summary revision of the government biodiversity programs. To ascertain the environmental impact, we would need data on threat level of the particular habitat being benefited by the program and the success level of the conservation measures taken as a result of the payments, for example. Given that the Funds and programs are being led and designed by reputable environmental and multilateral government organizations with strong biodiversity knowledge and experience, it is likely that the design and targeting of the biodiversity payments are being directed to high biodiversity impact activities.

To calculate the land conservation value per unit of spending, overall quantities of land paid for in the programs in contrast to program budgets need to be more closely analyzed. In many cases we are not clear if land listed in program size is a figure per year, or per program lifetime.

In our analysis of existing programs, our findings show that the current environmental benefit of government mediated biodiversity PES is medium (a score of 3). The potential environmental benefit of this market is high; as the program grows, the criteria that lead to high biodiversity benefits continue to bring more widespread positive results.

Of the categories under Environmental Impact, the current benefit of these programs to natural forests and forests under threat remain the lowest. In part, many of these programs aim to enhance the conservation practices of agricultural farmers, and other types of habitat. More data on countries forest cover and threat levels to the forests are needed to validate the estimates presented in these latter subcategories. In addition specifics about how each program allocates funding between forests and other land cover types is lacking. As natural and threatened forests are recognized as valuable to societies and become important drivers in the global fight against climate change and biodiversity loss, the importance of programs that facilitate conservation of these forests will increase and the potential for benefits to these forests will remain high.

In conclusion, 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.

Market Participants, Shapers and Service Providers

The Government mediated biodiversity PES market is shaped by a wide variety of actors and includes various participants. Though several governments have established their own national funds or systems which incentive private landholders to participate in conservation activities, international NGOs, multi-lateral agencies and private companies and foundations support many other governments in developing programs for biodiversity PES. These relationships bolster local, state and national governments efforts to enhance conservation and often provide much needed co-financing for programs. Advocates of this market include governments, legislators, NGOs, multi-laterals, and landholders, all groups which will ultimately benefit from the establishment of well-developed conservation programs. Critics of this market are varied and may include community groups and NGOs, analysts, scientists who may disagree with metrics defined by programs, and program participants, who may lack clarity on processes.

Emerging Issues

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.

Many emerging Debt for Nature swaps have taken place in the last few years, and offer interesting replicable models. To the extent that these are successful for biodiversity, additional debt forgiveness programs could arise.

Individual Fisheries Quotas (ITQs and IFQs)

Tundy Agardi

Fishing quota markets are an increasingly popular use rationalization scheme in marine fisheries around the world. Fishing quota systems have been in existence for centuries; historically, conventional quota allocations were granted for each fishery, but the resulting “race to fish” proved to be disastrous for so-called derby fisheries where use was not rationalized. In an attempt to steer previously open-access marine fisheries towards sustainability, quota allocations were granted to individuals in certain fisheries. Individually-granted quotas are generally known as IFQs (Individual Fisheries Quotas). Such IFQ systems are well developed in a handful of fisheries in Australia, Canada, New Zealand, South Africa, and the US. Within this broad category of IFQ exist true tradable market systems, collectively known as ITQ fisheries (Individual Transferable Quota) systems.

Allocations for ITQs are determined by fisheries biologists’ assessments of Total Allowable Catch (TAC) for a particular fishery each year. TAC varies according to the predicted strength of the targeted year class, biomass estimates, population dynamics of the species in question, stock considerations (genetic make-up and vulnerability due to population size), as well as environmental variability and its potential effects on population regeneration. TAC is also a function of the carrying capacity and the future value of the fish commodity. Once TAC is set, members of a fishery are then granted rights to a percentage of the TAC. These quotas can be fished, bought, sold, or leased.

Quota markets – in particular ITQ fisheries - constitute the only example of a true PES market in the marine realm. ITQ fisheries were first instituted in New Zealand under what was termed a “Quota Management System” for a handful of fisheries; in the intervening decades ITQ fisheries expanded to cover virtually all finfish stocks in New Zealand waters. Australia instituted ITQ fisheries in the western Australian, southern Australian and Tasmanian rock lobster fisheries, in the New South Wales ocean trap and line fishery, in the Northern tiger prawn fishery, and in the Western Australia and Tasmanian abalone fisheries. Iceland has ITQ systems in place for all fisheries taking place within its Exclusive Economic Zone (EEZ), including herring, capelin, cod, shrimp, lobster and scallops. The U.S. and Canada also have a few ITQ fisheries: in the U.S., Alaskan halibut and sablefish fisheries operate under an ITQ system, as do Mid-Atlantic surf clam and quahog fisheries and southern Atlantic (the region of the U.S. called southern Atlantic, which is actually in the North Atlantic Ocean) wreckfish fishery. However, a few years ago Senator Ted Stevens spearheaded legislation to impose a moratorium on further ITQ fisheries in the U.S., in order to review what some fishers felt were injustices in the system. In Canada, ITQ fisheries operate in the greater Bay of Fundy region and in the Canadian Pacific. In addition, ITQ systems have been put in place for the Canadian Atlantic Northern shrimp fishery, eastern Nova Scotia snow crab fishery, and the Canadian Atlantic offshore scallop fishery.

In the developing world, ITQ fisheries are more limited. Chile has an ITQ fishery for the large scale Patagonian toothfish (otherwise known as Chilean sea bass) fishery, and South Africa has a ITQ hake fishery within its EEZ. The failures of conventional, top-down down management have led to a search for alternative systems, including development of markets, in many countries.

There are some similarities between fisheries quota markets and other PES markets. According to Kerr et al., 2003, the spatial specificity of fisheries markets is analogous to non-uniformly-distributed pollutants (e.g. ground-level ozone). The existence of some very thin markets and the high degrees of vertical integration have led to concerns about market power. The joint harvesting process, where several species are caught simultaneously, is similar to the multi-pollutant problem where one source produces several pollutants simultaneously. In both cases, the need to balance a portfolio of quota across species (pollutants) and locations creates complexity that potentially raises transaction costs.

Yet the benefits of ITQ systems can be numerous. They certainly can be profitable: the 40 entrants in the Alaskan halibut/ sablefish fishery ITQ earned \$100,000,000 in one year (<http://www.foodandwaterwatch.org/fish/individual-fishing-quotas/ifq-factsheet>). ITQ systems can be economically efficient and at the same time environmentally more sustainable than conventionally managed fisheries. Contrary to expectations, allocating catch among vessels has been shown to reduce the amount of by-catch (wasted fish discarded at sea).

ITQs have much potential in developing country contexts, as they provide both economic and environmental benefits. However, ITQs are not a panacea, and there have been many controversies about setting of TAC, allocation of rights, trading, and the potential for social injustices that can inadvertently arise.

Grafton (1996) claims, for instance, that a tax on quota values is not neutral if the marginal opportunity cost of fishing effort is increasing in effort and if fishers are able to influence the setting of the TAC. He reacts to an earlier proposition fishers pay for the cost of defining and policing ITQs, suggesting that rent capture in renewable resources is fraught with complexities.

Grafton et al (2000) studied the Canadian Individual Vessel Quota (IVQ) system for Halibut in British Columbia. They compare actual efficiency to an estimate of 'best practice' efficiency. They conclude that benefits may take a few years to materialize and can be critically compromised by restrictions on the property right and its transferability. They emphasize the importance of pre-existing regulations and the bundling of property rights. They also find that benefits arise from changes in the quality and price received for fish as well as reductions in cost.

One of the assumptions of the efficacy of ITQ markets is that there is total compliance. However, opportunities to cheat the system are usually numerous, given the high costs and logistical difficulties of enforcing fisheries regulations at sea.

Another problem is in the fairness of allocation, and the tendency for the largest scale players to corner the market. For example, in New Zealand 80% of quotas are owned by 10% of the permit holders. In Iceland, 700 of the 1,000 small boat fishermen sold their quota to industrialized fishing boats (www.duke.edu/bio217.2002). ITQ fisheries can also hinder co-management, in which government partners with communities and/or industry to jointly manage the resource.

Fisheries rationalization schemes, if planned well and based on defensible TAC, can increase economic and administrative efficiencies and can reduce by-catch rates, thereby decreasing some of the environmental impacts of fisheries exploitation. ITQs based on Total Allowable Catch do not influence the amount of resource removed (i.e. the TAC is not affected by the market system, but is determined independently), but they can act to spread the effort over time. ITQs also can lead to an overall

reduction in effort as a function of fleet size, and as such address one of the greatest environmental problems of marine fisheries - that being too many boats chasing too few fish.

Market Profiles :: Bundled



Certified Agricultural Products

Meike Andersson and Thomas Oberthur

Certified agricultural products are of particular interest to developing countries where they may help to generate employment, boost export earnings, support small producers, improve food security and resilience to climate change, preserve environmental quality and diversify the local economy. Adopting these standards is a strategy for producers and exporters to add value to their products and increase the economic viability of small-scale agriculture. Rising demand for certified products creates new market segments where producers may be able to demand price premiums and secure buyers. Global retail sales of organic foods alone have increased by over 200% in less than a decade.

Certification schemes can be broadly classified into three different categories:

- **Fair Trade** – focus on social criteria (equitable and just remuneration of producers);
- **Organic** – focus on environmental health (production without use of pesticides or herbicides);
- **Biodiversity-friendly** (including bird-friendly and shade-grown) – focus on sustainability (protecting ecosystem health in general).

In practice, the standards overlap to a certain extent and many products or production systems are certified under more than one scheme (e.g., 80% of organic coffee is also fair-trade certified and vice versa).

Certification is available for a wide range of (mainly but not exclusively) food and beverages. Certification standards for biodiversity-friendly sourced products (including shade-grown and bird-friendly) are available for coffee, cacao, banana, and more recently oil palm. Established certification schemes include the Rainforest Alliance's (RA) ECO-OK program (coffee, cacao, banana, and—at much smaller scale—a range of other crops),

the Smithsonian Migratory Bird Center's (SMBC) "Bird-Friendly" label (coffee) and the UTZ Certified scheme (coffee, cacao, oil palm).

The market for certified agricultural products represents approximately 2.5% (US\$ 42,000 million) of global food and beverages and has shown sustained and high growth rates over the last two decades. Certain products have exceptionally high market shares, e.g. fair-trade bananas account for >50% in some European countries, and RA certified bananas command 15% of all sales in global banana trade. Current annual growth rates in terms of retail sales and production quantities roughly average 40% per year for organic and fair-trade products, 10–15% for RA certified products, and 25–40% for UTZ certified products. They can be as high as 90% in individual cases, for example fair-trade cocoa sales increased by 93% from 2005 to 2006, coffee by 53% and bananas by 31%. The expected medium term annual growth rates lie in the range of 15–20% for organic and fair-trade and 8–15% for RA certification.

Although certified agricultural products are now present in most parts of the globe, the demand remains concentrated in North America and Europe. The two regions are experiencing undersupply because production is not meeting demand. Thus, large volumes of imports are coming in from other regions, including developing countries. Generally, majority of fair-trade, RA and UTZ certified products are exported from developing countries to developed countries. These products thus have a good potential to add value to low- and high-value products of developing country producers. On the other hand, the market of organic products is considerably smaller in developing countries than in developed countries—in terms of production as well as in terms of local sales. However, in some countries local demand and local markets are developing rapidly. Initiatives such as the Certified Sustainable Products Alliance (CSPA)³ have a good potential to promote local and regional markets for certified agricultural products.

The current and potential environmental benefits are medium to high for the organic and biodiversity-friendly certification schemes, with medium to high potential benefits for the conservation of land, and natural and threatened forests. Concrete environmental benefits depend on the certification scheme, but may include: forest and watershed protection; avoided deforestation; improved water quality; wildlife and habitat protection; avoided erosion and soil degradation; enhanced soil fertility; avoided agrochemicals pollution. The potential environmental impact is greatest for traditional agro-forestry production systems such as coffee and cacao. It is slightly lower for banana and oil palm production systems, but the importance of protected forest patches and other wildlife habitats in non-productive areas of the certified farms should not be underestimated in the landscape context.

Market participants are all actors along the value chain, from small-, medium- and large-scale producers (as sellers), to industry partners in the widest sense (as buyers), including exporters, traders, processors, manufacturers, mainstream and specialty retailers, and end-consumers. The market is shaped by regulators and standard setters such as the IFOAM, FLO, Rainforest Alliance, UTZ, RSPO, Smithsonian and the USDA; and national and international governmental and non-governmental policy makers and advocates (e.g., USDA, UNDP, FAO, OCIA, EU, ITF, UNCTAD, UNEP, Oxfam, WWF, TWN, RAFI, FOE, GEF, ICO, ProForest, among others).

Consumer demand for certified products in general is increasing worldwide. In addition, the global economic development in general, and increasing consumer demand from rapidly growing markets in Asia (especially China, Japan, India) is increasingly favoring so far typically "western" products,

³ A collaboration of USAID, RA, its partners in the Sustainable Agriculture Network and more than two dozen companies

particularly cacao, coffee and palm oil products. The strong growth rates are expected to be reflected also in the certified market of these products. Increased public interest in global climate change may provide an additional incentive to emphasize the potential of organic and biodiversity-friendly agricultural practices to contribute to carbon sequestration, thus reducing CO₂ emissions.

Appendix 1:

Individual Fisheries Quotas

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Appendix 2: Certified Agricultural Products

Summaries of Selected Product Categories

Coffee

Coffee is a tropical tree crop. 50% of the world coffee production comes from Central and S America, with Brazil and Colombia being the leading producers. They are followed by Indonesia, Vietnam and Mexico. Coffee is produced both by smallholders and on large farms and estates. Estates are particularly important in Latin America but also in Kenya. Most of the remainder of African production is from smallholders.

In the US—home to the largest coffee market in the world—demand for specialty coffees is the fastest growing of any coffee market segment. Today, specialty coffees comprise roughly 30% of the US market. Similarly, the primary market for organic and other certified coffee is located in the US and Europe. The market share of certified coffee in global coffee retail sales is estimated to represent approx. US\$ 3,500 million (<5%), with the segments of organic and fair-trade coffee accounting for <1% each. Shade-grown coffee is estimated to be a US\$ 30 million business in the US, representing about 1% of total sales in the gourmet coffee market.

Current market growth is driven by growing consumer interest in the health effects of the products they consume, as well as by the remarkable popularity of specialty gourmet coffees. This is reflected in growth rates of the certified coffee segment in recent years. Despite a predicted slowdown of growth rates, the market for organic coffee has continued to grow at the same pace as the organic market in general in Western countries in the last years, showing a steady annual increase of 20% in retail sales. In 2006, retail sales of organic coffee in the US even increased 24% to US\$ 110.36 million. Compared to the share of organic products in the total food market (2%), the share of organic coffee in the total coffee market is still low (<1%) - hence the future potential is promising. The market for fair-trade coffee has grown even stronger and increased 53% in 2006, and it is estimated that the current world demand for organic and other certified coffees outstrips supply.

With respect to the market potential of biodiversity-friendly coffee production, experts predict substantial market growth. The coffee industry has been pioneers in piloting sustainability measures over the last 10-15 years, and it is very likely that all major actors in the coffee world will have some sort of sustainability standards and policies in operation before 2013. In 2005, RA certified coffee alone had a market share of 1% in global coffee trade (retail value of US\$ 300 million) and 14% of the market for certified coffees. The average growth rate over the last 5 years was 93%, i.e. approx. 13% annually. The Rainforest Alliance is currently executing a 7-year project supported by the GEF through UNDP with the aim to certify 10% of the world's coffee supply by 2013.

A recent development in the certified coffee market is the entry of large roasting companies into certification (e.g. Sara Lee, Kraft). In the coffee market in general, several trends are noticeable at the retail level: 1) increasing concentration in supermarket chains, 2) shorter supply chains as supermarkets strip out some tiers of intermediaries, 3) increasing out-of-home consumption of coffee with the increasing popularity of the café culture and the emergence of global café chains like Starbucks.

Cocoa

Cacao is cultivated in Africa, Asia and Central and S America, with W Africa being the dominant supplier. Two countries alone supply about 60% of the global cocoa production (Côte d'Ivoire 40% and Ghana 21%), followed by Indonesia (13%), Nigeria (6%) and Cameroon. Almost 90% of cocoa production comes from smallholder farms of under 5 ha (in Africa almost all, while in Indonesia and Brazil large estates and smallholders coexist), and about 20 million people depend on cocoa for their livelihood.

About 90% of the cocoa produced worldwide is used for the production of chocolate and chocolate products. The remaining 10% are used in the production of flavorings, beverages, and cosmetics. These products include baking cocoa, hot cocoa mix, baking mixes, packaged foods, and cocoa-butter based body care products.

The emergence of new chocolate markets in Eastern Europe and Asia is expected, since chocolate consumption in the Asia-Pacific region is increasing at a rate of 25% a year, and 30% in China. Future growth is also anticipated in the traditional markets of Europe and North America, with a particular demand for higher priced premium chocolate. If the political crisis in Côte d'Ivoire results in shortage of supply, prices will increase. The continued supply in the medium and long-terms of mainstream cocoa in general, and premium cocoa in particular, is a major issue facing the cocoa industry.

As in coffee, strong consumer interest in the reported health benefits of dark chocolate and a general trend towards product premiumization (including organic and fair-trade products) are the main drivers in current market growth. The US chocolate market is far from being saturated, and the market share for premium chocolate (including organic and fair-trade products) grew from 13% of the total market in 2002 to nearly 17% in 2006. Premium chocolate sales are forecast to continue expanding, commanding 25% of the market by 2011 and generating US\$ 4.5 billion.

Currently, social issues (e.g., child labor) are highest on the industry's sustainability agenda and biodiversity aspects are not fully addressed by major industry players. However, a number of industry sustainability initiatives are currently underway and the continuing concern about sustainability of cocoa supply provides ample opportunity for initiatives related to biodiversity conservation. This is reflected in annual growth rates of the organic cocoa market: between 10–15% from 2000 to 2003, and between 16–20% from 2002 to 2005. The interest of the large supermarkets in organic chocolate has increased and significant sales growth is also likely in the future (5–10% annually). The market growth of fair-trade chocolate has increased even stronger in recent years, and during 2006 the sales of fair-trade cocoa have almost doubled (93% growth).

Banana

With the certification of 100% of Chiquita and ReybanPac banana plantations to RA standards, the market share of biodiversity-friendly produced bananas has reached 15% in global banana trade and accounts for approx. US\$ 700 million. The market shares of organic and fair-trade bananas are considerably smaller, although fair-trade bananas command between 8% and 55% in some European countries (UK, Switzerland, Finland). Considerable areas are being converted to organic agriculture, especially in Ecuador and Peru, and supply is anticipated to continue increasing rapidly.

The market of organic bananas has shown dramatic growth rates during the end 90's (imports grew approximately 30% per year), and the sales of organic bananas in supermarkets are still increasing by 15 to 50% per year. Growth rates in the fair-trade sector have been similarly strong, with banana sales increasing by 31% from 2005 to 2006. However, banana consumption in general is relatively static, and the growth of the certified banana market has slowed down in recent years, especially in W Europe. Experts do not anticipate significant increases in Western market shares and predict that supply will

probably outstrip demand. On the other hand, Asian markets such as Japan are forecast to expand rapidly as organic producers and traders adapt to the recent Japanese Agricultural Standard (JAS) regulation on organic labeling. Substantial growth could also come from the adoption of other certification standards (e.g. RA) by new (mainstream) producers.

Palm oil

Oil palm is cultivated in Africa, Latin America and SE Asia. More than 80% of the exported palm oil production comes from Malaysia and Indonesia; about 1/3 of palm oil production in Indonesia and Malaysia comes from smallholder plantations (usually monocultures in concessions). Other significant palm oil producers are Nigeria, Thailand, Colombia, and Papua New Guinea.

Due to strong pressure from NGOs, the palm oil industry is well aware of its impacts on biodiversity, in particular from forest conversion and insufficient corridors for megafauna in the production landscape. Organic and biodiversity-friendly palm oil can become an important value-added attribute, especially in food preparations (snacks, confectioneries, bakery products and baby foods). Currently, organic palm oil comes from Africa and Latin America, but there is also good potential for organic palm oil production in SE Asia. The Roundtable for Sustainable Palm Oil (RSPO) has been created as a platform to discuss and address biodiversity (and social) impacts and brings together industry leaders that account for 30-50% of the world's palm oil exports. The RSPO traceability system for Certified Sustainable Palm Oil, which is being developed together with UTZ Certified, is planned to start this year.

All experts agree to forecast a general significant increase in oils and fats demand in the future. The average world growth rate was around 3% in the past 30 years, and palm oil is the fastest growing segment of the global vegetable oil market. It is estimated that today palm oil is found as an ingredient in more than 10% of all consumer goods products in a supermarket, including chocolate, snack foods, detergents, toothpastes and shampoo. After slow growth rates during the 80s, the market share of palm oil has almost doubled compared to 1980 (14.5%) and now accounts for nearly a third (28.3% as of 2005) of the world's total vegetable oil consumption. The expected additional demand for biofuels is likely to accelerate this general trend.