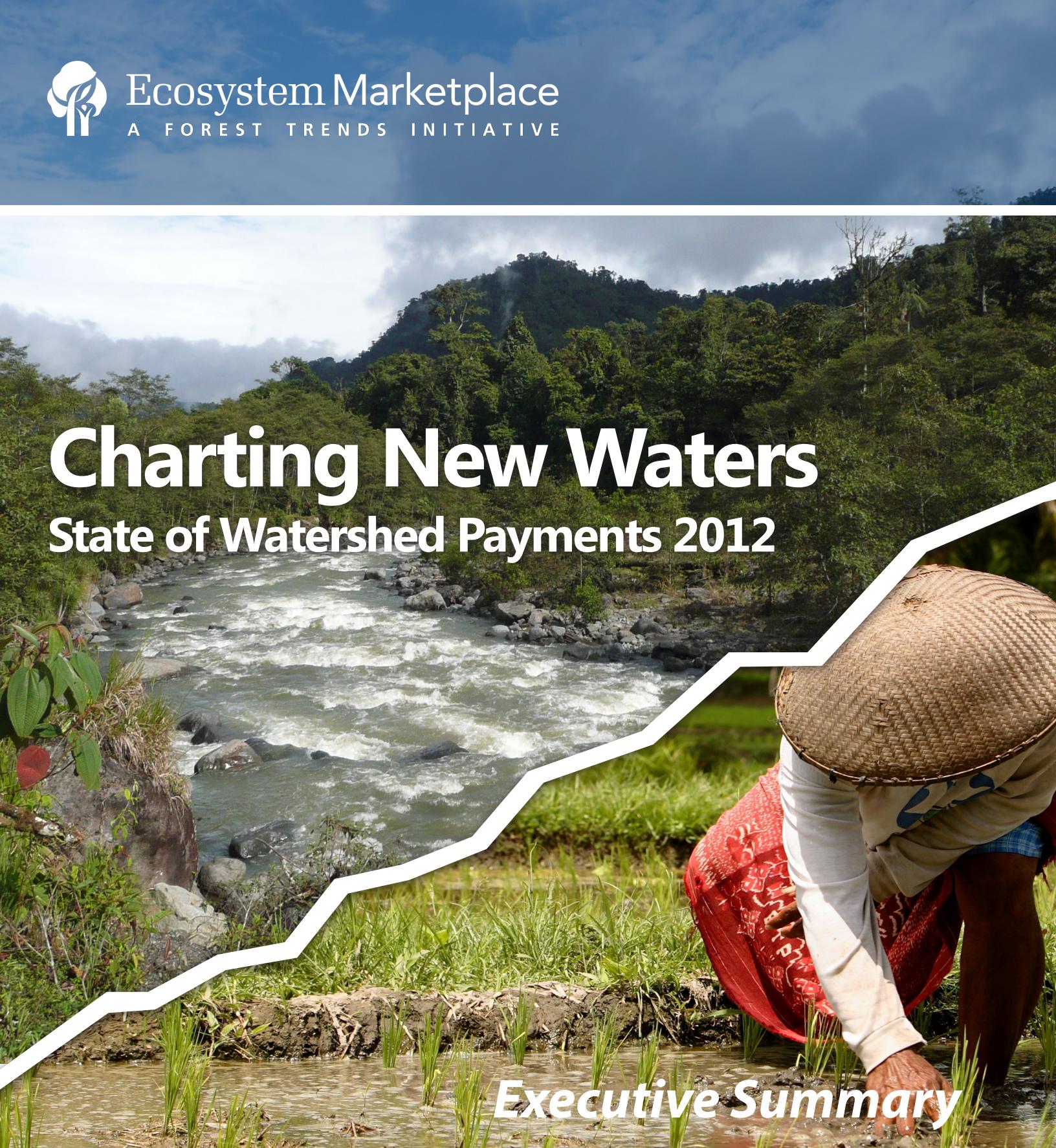




Ecosystem Marketplace  
A FOREST TRENDS INITIATIVE

# Charting New Waters

## State of Watershed Payments 2012



## Executive Summary



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Forest Trends' mission is to maintain, restore, and enhance forests and connected natural ecosystems, which provide life-sustaining processes, by promoting incentives stemming from a broad range of ecosystem services and products. Specifically, Forest Trends seeks to catalyze the development of integrated carbon, water, and biodiversity incentives that deliver real conservation outcomes and benefits to local communities and other stewards of our natural resources.

Forest Trends analyzes strategic market and policy issues, catalyzes connections between producers, communities and investors, and develops new financial tools to help markets work for conservation and people.

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## About Ecosystem Marketplace

**Ecosystem Marketplace**, an initiative of the non-profit organization Forest Trends, is a leading source of information on environmental markets and payments for ecosystem services. Our publicly available information sources include annual reports, quantitative market tracking, weekly articles, daily news and news briefs designed for different payments for ecosystem services stakeholders. We believe that by providing solid and trustworthy information on prices, regulation, science and other market-relevant issues, we can help payments for ecosystem services and incentives for reducing pollution become a fundamental part of our economic and environmental systems, helping make the priceless valuable.

Find out more at  
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## About Watershed Connect

Watershed Connect, a project of Forest Trends and Ecosystem Marketplace, is an online platform connecting practitioners, policy-makers, and other stakeholders involved in investing in our natural water infrastructure. The online platform serves as a centralized space to learn about the latest news and analyses, join relevant social media discussions, share your project or organization's work, access key resources and tools, and research ongoing efforts on investments in watershed services (IWS) and water quality trading.

Find out more at  
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## Acknowledgments

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# **Charting New Waters**

## **State of Watershed Payments 2012**

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# Executive Summary



**Table 1: Summary Details, Global**

<b>Number of active programs:</b>	<b>205</b>
<b>Number of programs in development:</b>	<b>76</b>
<b>Value of transactions in 2011:</b>	<b>\$8.17 billion</b>
<b>Value of transactions 1973-2011:</b>	<b>\$66 billion</b>
<b>Hectares managed for watershed services in 2011:</b>	<b>117 million hectares</b>
<b>Hectares managed for watershed services 1973-2011:</b>	<b>195 million hectares</b>

*Source: Ecosystem Marketplace.*

## Overview

This report is the second installment in the “State of Watershed Payments” series, an effort to globally track the size, scope, and direction of investments in watershed services (IWS) as well as the ecological infrastructure from which they flow. Throughout this report we use the term ‘investments in watershed services’ to cover the broad diversity of incentive- or market-based mechanisms being used to protect the natural infrastructure of watersheds – including payments for ecosystem services (PES), payments for watershed services (PWS), water quality trading markets, and reciprocal or in-kind agreements. Data comes from surveys, interviews, and desk research on over 200 programs worldwide in more than 30 countries.

## Report Objectives

Building on the 2010 *State of Watershed Payments* report, the primary objective of the current report is to provide an accurate snapshot of the scale, size, shape, and direction of investments in watershed services worldwide.

A second objective of this report is to provide detailed design and project analysis that informs smart decision-making among policy-makers, local communities, conservation organizations, private businesses, and other natural resource managers. The IWS field is growing rapidly; transparency and access to reliable information is critical to ensure that practices and policies are beneficial for both society and nature.

Gathering project-level information at a global scale on mechanism design, transaction values, and project outcomes is no small undertaking. Information on projects and programs is often scarce, fragmented, and rapidly changing. This report represents our most comprehensive inventory of programs yet, but it is not the complete picture. In all cases, we have done our best to err on the side of conservatism in our estimates and analyses.

In this report, we offer an overview of our findings at global and regional scales. More detailed project-level data is available in our online global project inventory at [www.watershedconnect.org/projects](http://www.watershedconnect.org/projects).

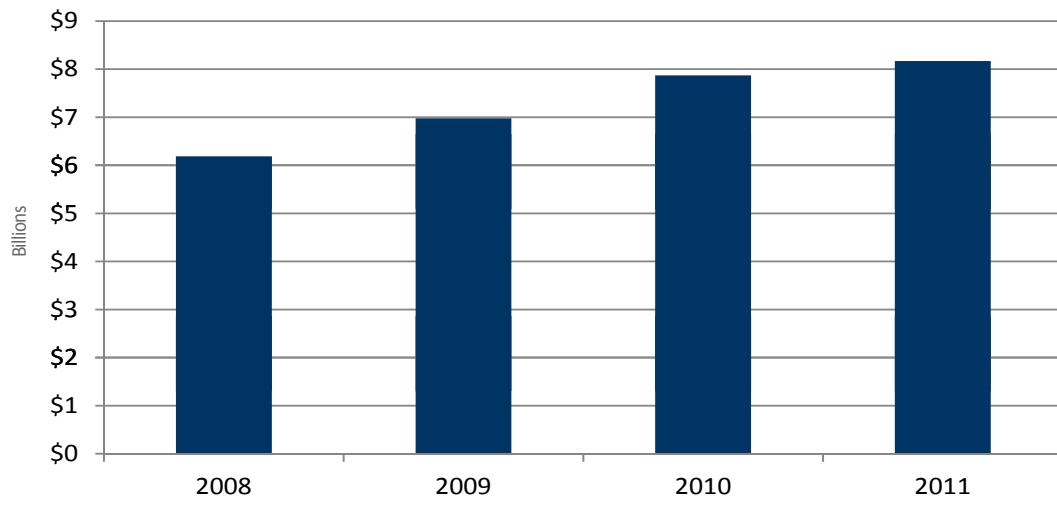
## Key Findings: By the Numbers

In 2011, we tracked 205 active programs around the world. More than half of the programs are in two countries: China (61) and the United States (67). In all, watershed investment programs are active in 29 countries.

Transactions totaled \$8.17 billion in 2011. Globally, investments in watershed services have steadily increased since tracking began in 2008.<sup>1</sup> On a regional level, the picture is a bit different. 2011 was a slower year for IWS in North and Latin America. But preliminary evidence suggests that markets saw a bounce in 2012.

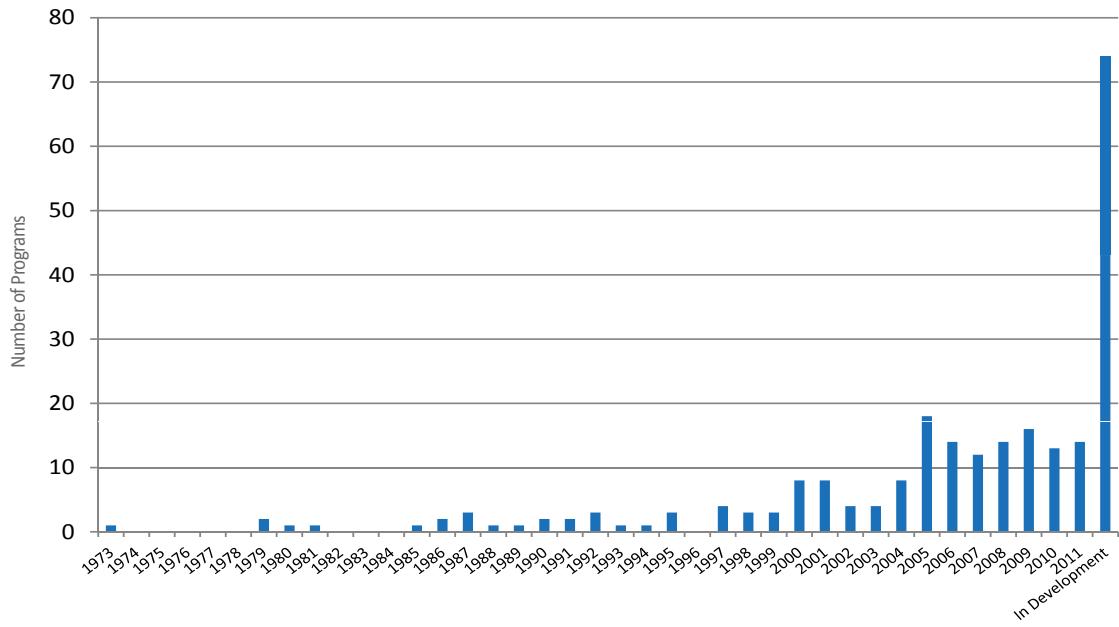
China represents the lion's share of reported payments as the country's leadership has increased funding for "eco-compensation" mechanisms and placed eco-compensation in a key role in the most recent national Five-Year Plan and in a proposed new zoning system. In the aggregate, Chinese economic muscle has more than offset falling investments in ecological infrastructure in North and Latin America, traditionally global leaders in funding watershed protection.

**Figure 1: Global Annual Transactions, 2008-2011**



*Source: Ecosystem Marketplace.*

**Figure 2: New Watershed Investment Programs by Year, Globally**



*Source: Ecosystem Marketplace.*

<sup>1</sup> In contrast to our 2010 report, we have tightened our scope here to exclude bundled government agri-environmental schemes that pay for environmental stewardship but do not focus primarily on watershed services. Programs like these certainly can support watershed functions but are not driven by them. Where our 2008 baseline data is discussed in this report, we have revised it to reflect these changes.

In terms of environmental outcomes, these payments have translated into efforts to rehabilitate and protect nearly 117 million hectares – a total land area nearly the size of South Africa.

Of course, not all programs measure success in terms of land. Programs also returned nearly 138,000 megaliters of water to rivers and aquifers around the world in 2011 and more than 4.6 million megaliters to date – that's the equivalent of enough water to nearly fill Lake Michigan. Thanks to watershed investment programs, 3.4 million pounds of nitrogen and 97,000 pounds of phosphorus were kept out of global waterways in 2011, where they would have led to algal blooms and oxygen-starved “dead zones.”

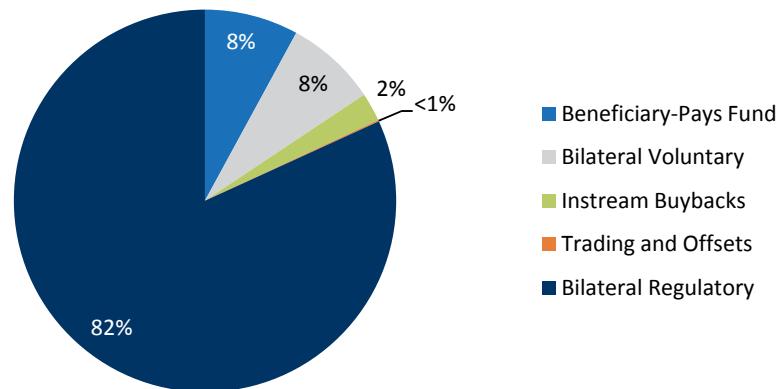
Nor do all watershed investments take the form of cash payments. We also see watershed service providers being compensated in the form of technical training, agricultural inputs, or even tenure security. Our survey respondents, where possible, have estimated the value of in-kind payments to be included in our aggregate transaction figures.

## China Takes the Wheel, Water Funds Take Off, and Nutrient Trading Takes It Easy

Watershed investments had their share of highs and lows in 2011. In some regions, a still-sluggish economy seems to have dampened activity, while in others, natural infrastructure's cost-effectiveness made it all the more attractive. A sampling of key report trends to take away:

- **China has cemented its position as a global leader in using compensation for ecological restoration and protection.** The country's political leadership has given “eco-compensation” a key role in China's latest Five-Year Plan and a proposed national land zoning system. Water insecurity poses probably the single biggest risk to the country's continued economic growth today, and the government has clearly decided that its ecological investments will pay off.<sup>2</sup>
- **Water funds**, which draw on a mix of funding streams to capitalize a fund, generally managed in trust, to invest in conservation and restoration projects, **are the fastest-growing model today in Latin America.** We've tracked eight new funds since our 2008 baseline and at least another seven are set to launch in 2012 and beyond. A new \$27-million dollar partnership between The Nature Conservancy, the FEMSA Foundation, the Inter-American Development Bank, and the Global Environment Facility aims to have 32 funds capitalized across Latin America by 2015. These funds offer sustainable financing, long-term stakeholder engagement, and flexibility to select projects at a landscape scale.
- **2011 was a slow year in North America as far as water quality trading,** with \$7.7 million in trades tracked down from a 2008 high of \$10.6 million. A slow economy is probably partly to blame, although we also see some signs that counter-intuitively suggest this means that markets are working. Survey respondents reported that increased engagement with nonpoint-source credit sellers like farmers translated into lower credit prices (and thus lower overall market values). Meanwhile, a number of point sources noted that they'd come in under their regulatory caps so haven't needed to trade at all in 2011, suggesting that trading in recent years had allowed them to buy time while making environmentally-friendly technological upgrades.

**Figure 3: Transactions by Watershed Investment Program Type, Annually**



*Source: Ecosystem Marketplace.*

<sup>2</sup> World Bank, 2007.

- **We tracked growing interest in stacking and bundling payments for multiple ecosystem services** – not just in the US, but also in Indonesia, Vietnam, Tanzania, Kenya, and Colombia. ‘Bundling’ refers to a payment that recognizes multiple ecosystem services delivered by an intervention, while “stacked” payments not only recognize multiple services but offer distinct revenue streams for each. Biodiversity is the most commonly “bundled” service, though the degree of rigor in measuring and protecting it appears to vary quite a bit. Financing for stacking and bundling remains mostly “internal” – we aren’t yet seeing many signs of linkages to new buyers in the carbon or biodiversity markets.
- **It’s not just developing countries who rely on natural water infrastructure to keep water sources clean and safe.** Green infrastructure as a substitute for or complement to traditional engineered approaches is gaining currency in the developed world – from using forests as green infiltration galleries in Germany, to using mussel beds to filter nitrate pollution instead of a treatment plant in Sweden, to New York City planning to restore wetlands to its waterfront to deal with storm events.
- **For the first time, we’ve tracked environmental water markets in Australia and the United States.** Governments and conservation groups are taking advantage of traditional water rights markets – which have historically been used by irrigators and municipalities to trade water rights for consumptive use – to buy and retire water rights to ensure sufficient water is left in rivers (known as “instream buybacks”). It’s an innovative use of existing markets to achieve environmental goals that channeled more than \$171 million in 2011 to restoring critical river systems.

## A Field Guide to Watershed Investments

The term ‘investments in watershed services’ covers a spectrum of instruments in practice. All are premised on the idea that our ecological infrastructure has tremendous value: we rely on it to filter our drinking water, absorb floods, keep soil on the land from eroding and clogging waterways, and recharge aquifers. Healthy watersheds can often do all of these things more cost-effectively than built infrastructure and with co-benefits like providing wildlife habitat and sequestering carbon.

In more than 200 towns, cities, and regions around the world, leaders and communities have opted to invest in our natural infrastructure and reward the people who protect it. The approach is a powerful new source of financing for conservation, a cost-effective way to ensure clean drinking water and supplies for other uses, and can be tailored to improve livelihoods in poor and rural communities who often manage water resources at their source.

In this report, we track a variety of mechanisms for investment and a range of terminology being used to describe them – from “payments for ecosystem services” to “reciprocal agreements for water” to “eco-compensation.” But all have some common elements (see Table 2). Where they vary lies in how these elements are operationalized. Project design can vary according to a region’s regulatory and institutional frameworks, local politics, economic realities, and regional environmental problems.

In our tracking, we see many of these design elements tending to “cluster” together. For example, a “polluter pays” program might usually be linked to some regulatory driver and transacts payments in cash. Cluster analysis on our inventory of global programs gives us several overarching program types that repeatedly appear around the world. We use these broad groupings in analysis in this report, as we feel they best reflect the “on-the-ground” realities of investments in watershed services, as opposed to a theory-driven typology. Still, it should be noted that these are general types; in practice we see a range of sub-types and hybrids.<sup>3</sup>

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<sup>3</sup> For further discussion, please see Forest Trends’ forthcoming white paper which can be accessed at <<http://forest-trends.org/dir/iw-types/>>.

**Table 2: Key Elements of Project Design**

Design Element	For example...
<b>Hydrological Service Goals: What problem is this mechanism trying to solve?</b>	- Groundwater infiltration, filtering of pollutants, or trapping of sediments
<b>Scale: At what geographic level do investments occur?</b>	- Local or watershed-scale - Regional, spanning multiple watersheds or jurisdictions, or encompassing a major basin - National, active in multiple areas or across an entire country
<b>Participants and other Stakeholders: Who are the key actors?</b>	- Providers: Private or communal landholders, forest managers, factories or treatment plants discharging into a water body - Beneficiaries: Water users downstream, hydropower operators concerned about sedimentation of their reservoir, beverage companies depending on clean water supplies - Other stakeholders: Community organizations, regulators, policy-makers, conservation professionals, ecosystem market service providers (such as aggregators or trading platform hosts)
<b>Buyer: Who pays?</b>	- Beneficiaries - Polluters - Public good payers (such as a government or NGO)
<b>Intervention: What does the buyer pay for?</b>	- Agricultural best management practices - Afforestation/reforestation or improved forest management - Technology upgrades to limit polluted discharge - Water rights transactions
<b>Driver: Why does the buyer pay?</b>	- Voluntary arrangement - Discharge permit requirements - Environmental tax or fee on water use
<b>Exchange Arrangement: How do they pay the hydrological service provider?</b>	- Bilateral contracts - Water fund - Marketplace mechanism
<b>Compensation: What form does the payment take?</b>	- Cash - In-kind: Agro-inputs, technical training, or tenure security
<b>Co-Benefits: Does the program have multiple objectives, beyond hydrological services?</b>	- Socio-economic goals: Poverty alleviation, indigenous representation/management of resources, or gender equity - Environmental co-benefits: Habitat for imperiled species, carbon sequestration, or landscape beauty

*Source: Ecosystem Marketplace.*

### Core Program Types

When people talk about payments for watershed services, they are generally referring to either a bilateral agreement or a beneficiary-pays fund. These two are the most commonly observed program types around the world, though in practice we see a good deal of variation on these broad models. Beyond differences in implementation, we also see evidence of hybrids and even one type morphing into another over time. In addition to bilateral agreements and beneficiary-pays funds, we track two other general types: trading & offsets and instream buybacks. In this report, we attempt to highlight trends and outcomes specific to different program types wherever useful for the models described below.

## Key Programs Tracked in this Report

### BILATERAL AGREEMENTS

The largest group of programs tracked is bilateral agreements, which are characterized by the use of direct deals between payer and provider. Multiple payers and providers may participate in the program, but contracts always take a bilateral form, as opposed to using other exchange arrangements like a marketplace or water fund mechanism. Government agri-environmental payments often fall into this category. Bilateral arrangements may be either voluntary on the part of the payer or driven by some form of regulation. These types of arrangements are observed at a range of scales, from a local deal up to a national-level payment program.

### BENEFICIARY-PAYS FUND

Here, individuals or organizations who benefit from watershed restoration or preservation contribute to a centralized fund, often matched by public co-investment. The contributors to the fund do not necessarily determine how money is invested in the watershed; generally some trustee, council, or technical committee selects interventions. An endowment fund is a common feature, with only interest being used for restoration or conservation projects while the principal is left untouched. We also often see a mix of participation drivers on the payer/beneficiary side: some beneficiaries (usually domestic water users) may be required to contribute to the fund through mandatory fees, while others participate voluntarily. Watershed service providers always participate voluntarily. These schemes predominantly take place at the local level though there are also instances of regional and national programs that fall into this type. These programs are most often seen in Latin America.

### TRADING & OFFSETS

These are the cases where we observe a fairly high degree of commoditization of watershed services, often paired with some kind of marketplace exchange arrangement. Water quality trading programs in North America and Oceania fall into this group as do some quantity-driven mechanisms like groundwater mitigation banking programs and instream flow restoration certificates in the United States. The “polluter pays” principle is often an underlying force: there is usually a linked regulatory driver for participation, particularly on the side of the buyer.

### INSTREAM BUYBACKS

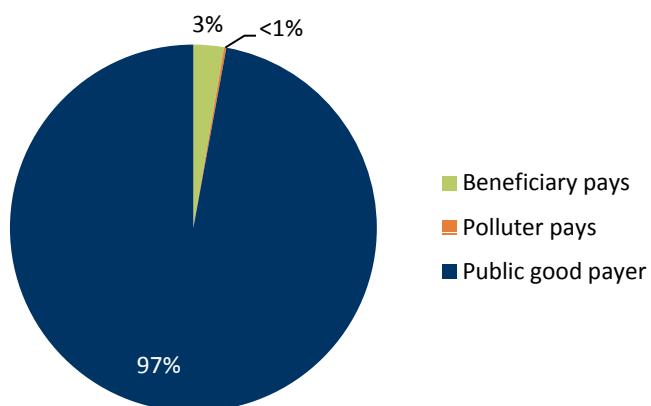
Instream buybacks are the purchase of water rights for the purpose of leaving that water instream (rather than diverting it for irrigation, drinking, or some other consumptive use) to restore natural flow regimes. These transactions usually have a strong biodiversity co-benefit component, with the goal of protecting or enhancing aquatic and riparian habitats. The buyer is generally a government or non-profit organization which may not necessarily benefit from the intervention; in this respect the presence of a “public good payer” is a defining characteristic of instream buybacks. We observe these types of programs only in areas with defined property rights for water extraction and existing markets for water rights – thus to date, instream buybacks have only taken place in Australia and the United States.

### Who's Buying? Who's Selling?

We find three main types of funders: beneficiaries of watershed protection (like a downstream city), polluters compensating for their impacts (like a factory offsetting its polluted effluent) and ‘public good payers’ that may not be directly benefitted by or responsible for watershed cleanup, but fund it nonetheless on behalf of general welfare (usually a government or NGO).

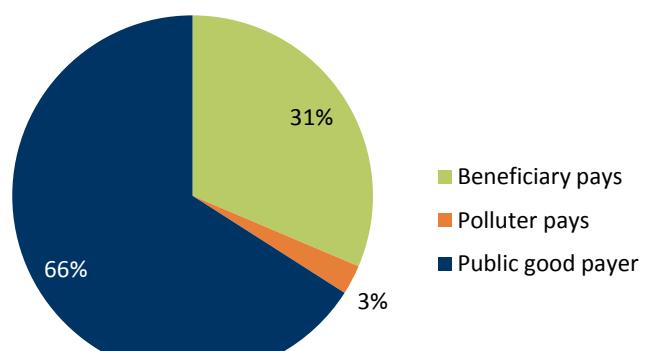
Considered by payer type – beneficiary, polluter, or a public good payer – payments were overwhelmingly initiated by public good payers like governments and NGOs. However, China again skews these numbers with massive spending by government eco-compensation programs (see Figures 4a and 4b). When China is set aside, beneficiary-pays programs account for an estimated \$162 million out of \$517 million in global transactions, or nearly a third of payments. Polluter-pays programs, leaving aside China, comprise about three percent of transactions.

**Figure 4a: Watershed Investments by Payer Type, Globally**



Source: Ecosystem Marketplace.

**Figure 4b: Watershed Investments by Payer Type, Globally, Excluding China**



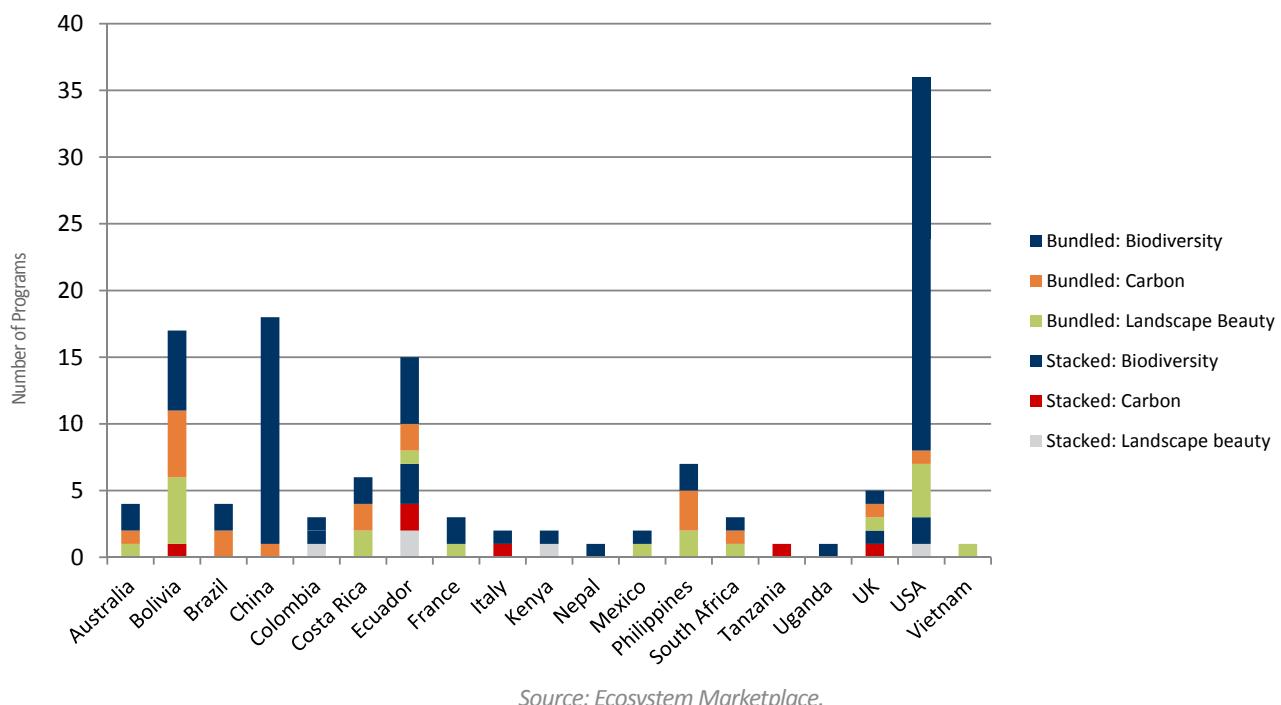
Source: Ecosystem Marketplace.

## Co-Benefits

### Environmental Co-Benefits

Sixty-six programs – nearly a third of those tracked – reported that they engage in some form of stacking or bundling (see Figure 5). Conservation of habitats that support biodiversity was the most common ecosystem service targeted. Most often this meant protection or rehabilitation of ecologically valuable habitats, although a large number of bundled biodiversity payments were instream buybacks in the US and Australia, where restoring natural flow regimes was expected to support aquatic and riparian habitats. These programs are often driven by concerns about endangered and threatened species.

**Figure 5: Stacking and Bundling with Watershed Investments, Globally**



Source: Ecosystem Marketplace.

Although we did not ask programs to provide detailed information on how bundled environmental co-benefits are measured, protected, or monitored, we suspect that there is considerable variation across programs, ranging from assuming habitat protection will deliver biodiversity benefits to very detailed tracking and management strategies.

Thirteen programs reported that stacking payments for co-benefits was taking place. These tended to be Latin American water funds or programs supported by a single buyer. In all cases but one, payments came from ‘inside’ the program – that is, through existing funding streams and established buyers.

### Socio-Economic Co-Benefits

We tracked 54 programs that report explicit social objectives, exhibiting a variety of social goals (see Figure 6). Nearly half of these are in China, where eco-compensation can be considered in part a rural welfare support program to more evenly distribute benefits of economic growth to poorer regions of the country.

Investments in watershed services programs also appear to be pursued as a strategy for community development; program requirements like strong social capital, functioning institutions, and tenure security also support larger goals of socio-economic development.

Though some programs offer compelling evidence that social goals are being met with demonstrated improvements for incomes, equity, and food security, we also found that worryingly little socio-economic monitoring appears to be taking place.

## Outlook

We've seen watershed investment programs nearly double in number and geographic spread over the past four years. These four years have also seen government cutbacks, austerity measures, down-sized corporate environmental departments, and unprecedented economic and political uncertainty, including the largest global recession in recent memory.

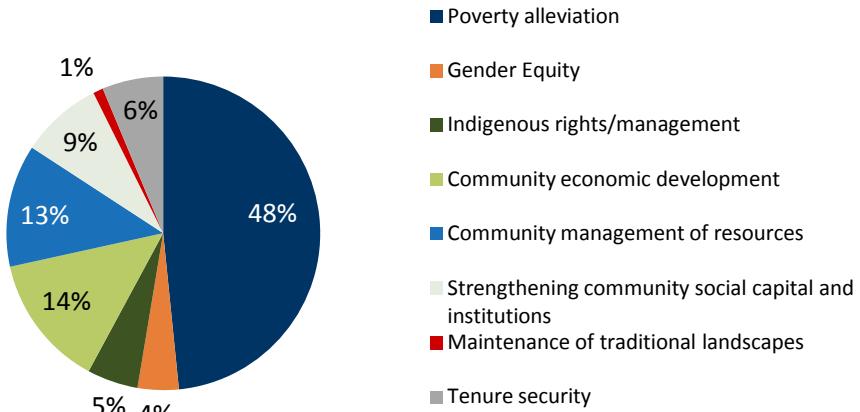
Such continued growth in management systems for a natural resource in the midst of a major global economic downturn should be raising eyebrows. Leaders and communities around the world are recognizing water security as a serious problem and taking creative steps to address it.

This report attempts to capture activity that has taken place over the course of a year, 2011, that is already in our past. But in our research, we've also come across new developments, ongoing trends, and future projections. In this section, we summarize the most important of these.

### The Good News

- **With 76 new programs in development, interest in IWS clearly continues to spread.** Countries like Gabon, Ghana, Kyrgyzstan, Malawi, Bulgaria, and Romania are in line to implement their first IWS mechanism in 2012 and the coming years.
- **China's already-massive investments in watershed services are expected to grow even more,** as eco-compensation settles into its new role as a key element of environmental policy in the most recent Five-Year plan and new land-zoning framework, a new national ‘eco-compensation’ ordinance, and ramped-up government funding for pilots.
- **Latin American transactions overall are expected to see a jump in 2012.** Between new water funds coming online and increased funding for national programs like Mexico’s **PSAH** and Ecuador’s **Socio Páramo**, relatively modest activity in Latin America appears to have turned the corner in 2012 based on our initial tracking.
- **Water quality markets in the United States are expected to see a 2012 bounce** as well, with an uptick in overall economic activity and a surge of regulatory drivers behind new growth. New water quality standards in the Chesapeake Bay watershed made themselves felt in 2012. The first interstate water quality trading program under a single set of rules also expects to begin trading soon in the **Ohio River Basin**. We’re also tracking the emergence of a new player in water quality trading: private nutrient banks,

**Figure 6: Socio-Economic Objectives Reported by Watershed Investment Program Globally**



*Source: Ecosystem Marketplace.*

which are repurposing the wetland banking model for nutrient credits. In Virginia, banks look to have quadrupled in number in 2012 and have been behind a big piece of trading activity in the state.

- **Transboundary programs are slowly emerging.** We tracked a developing program in the **Danube Basin**, as well as a new effort to restore instream flows in the **Colorado River**, which flows from the United States into Mexico, with a coalition of American and Mexican NGOs working together to secure instream flow rights.
- **Increased experimentation with stacking and bundling of multiple ecosystem services is everywhere.** We've heard about streambank credits in the US state of Georgia, programs linking with carbon in Indonesia, bundled payments for landscape beauty by tourism operators in Vietnam, and more. While in 2011 payments still tended to come from "inside" existing programs – that is, from the same buyers that also paid for watershed services, rather than new sources of financing – in 2012 and beyond we expect to see increased cross-investment between ecosystem markets. We've heard about pollinator credits stacking with water quality, wetland banks pursuing both carbon and nutrient accreditation, water funds linking to international carbon markets, and more.
- **Climate risk adaptation and mitigation are increasingly cited as a driver of watershed investment.** Protecting water supplies from climate change effects like natural disasters, glacier melt, and food insecurity were much more frequently reported as program drivers than in our last survey, though it's not always clear how these concerns are translating into management. Better information about how IWS can increase resilience to climate effects and natural disasters and the cost-effectiveness of doing so will likely strengthen the usefulness of IWS mechanisms as a tool for communities in long-term planning. IWS as a risk mitigation strategy is already being taken up in locales from New York City and Denver to Peru and the Philippines.

## The Bad News

- **We have seen little movement from the private sector to tackle their water-related risk.** Fifty-three programs tracked use some private sector funding, but these are nearly always regulation-driven and public or NGO-initiated. IWS remains largely powered by the public sector and public good investors. This trend is echoed in a recent Deloitte report (CDP Global Water Report) showing that over half the Global 500 companies report having experienced water-related challenges, yet are failing to take action to improve water stewardship. The exception to this are a few progressive and clearly exposed businesses, namely certain beverage companies including the members of the Water Futures Partnership, Coca-Cola, natural mineral water companies, and a number of breweries around the world.
- **In many regions and particularly Africa and Latin America, new or developing programs identified in 2008 no longer existed by 2011.** This seems to be directly linked to initial grant monies running out and programs struggling to stay operative thereafter. Of course, sometimes an IWS mechanism may simply not be appropriate to a given locale or water resource problem. But it's an unwelcome trend nonetheless, and underscores how long-term financing and local ownership are essential.
- **Survey responses suggest that socio-economic monitoring is relatively rare.** Only sixteen cases of monitoring these impacts were reported. In contrast, 126 programs confirmed that environmental monitoring takes place.

## The Bottom Line

We hope you'll come away from this report convinced of two things: firstly, that the widespread adoption of ecological investment mechanisms is a key part of any strategy for ensuring secure and sustainable water systems – and secondly, that accurate tracking of these finance mechanisms and making information about them freely available to decision makers around the world is crucial to timely and widespread adoption. The latter conviction drives this report and the rest of our work at Ecosystem Marketplace.

The global landscape in 2011 looks very different from what we found in 2008 in our first report. Water insecurity has sharpened the need for scaling up investment in our ecological infrastructure, while patchy global economic growth has underlined the need to do so cost-effectively.

This report tracks a rich and diverse portfolio of programs around the world that have found creative ways to finance safe drinking water and instream supplies. Models for watershed investment have both multiplied and matured since our last report, and show great promise in 2012 and beyond.

# Mapping Watershed Payment Programs







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