



## **Paying nature for services rendered - the case of water**

**Thursday, 29 November 2007, 9:30-12:00  
International Environment House II, ground floor**

Does the price of our tap water include payment for the natural purification carried out by forests, wetlands and soil? Ecosystems provide essential services for sustaining life on the planet. They improve water quality through filtration, prevent floods, regulate run-off, reduce erosion and lower the risk of land-slides.

But against a backdrop of growing demand for water, environmental degradation continues to worsen, threatening natural resources as well as the ecosystems that support them.

The "payment for ecosystem services" approach has received growing attention in recent years as an effective tool for generating additional financial resources, redirecting funding to environmentally sound technologies and sustainable practices, creating incentives for investment and increasing private-sector involvement.

Today's roundtable brings together an array of stakeholders who will share experience, recommendations and innovative stories from around the world.

- |       |   |
|-------|---|
| 9:00  | Coffee  |
| 9:30  | Welcome, Christophe Bouvier, Director, UNEP Europe  |
| 9:40  | Introduction by the moderator, Sibylle Vermont, Senior Scientific Officer, Swiss Federal Office for the Environment   |
| 9:50  | Presentations by the panel members: <ul style="list-style-type: none"><li>• Francesca Bernardini, Secretary, UNECE Water Convention</li><li>• Claudia Sadoff, Economic Advisor, Water Programme, The World Conservation Union (IUCN)</li><li>• Tobias Salathé, Senior Adviser for Europe, Ramsar Convention</li><li>• Rob Hope, Senior Research Fellow, Oxford University Centre for the Environment</li><li>• Emmanuel Manichon, President, Nestlé Waters Vosges</li></ul> |
| 11:00 | General debate and question and answer session  |
| 11:50 | Wrap-up by the moderator  |
| 12:00 | Close   |



## Paying nature for services rendered – the case of water

### Speaker biographies

**Francesca Bernardini** is the Secretary of the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Aim of the work under the Convention is to promote transboundary cooperation, ecologically sound and rational water management, and conservation of water resources in the region, in particular in countries with economies in transition. A chemical engineer by training, she previously worked for the UNECE's programme on the Transport of Dangerous Goods.

**Christophe Bouvier** is Director of the UNEP Regional Office for Europe. Prior to this, he was the UNOPS Regional Director for Central Asia, North Africa, Near East and Europe, and most recently Strategic Advisor for UNDP Iraq. He has over 27 years of experience within the United Nations system and has held senior positions at UNDP and the FAO, in charge of a range of development, humanitarian, peace-building and environment-related activities.

**Rob Hope** is a Senior Research Fellow at Oxford University Centre for the Environment. Rob's research interests focus on development policy and environmental management. He has published widely on evaluation of policy design and societal impacts of payments for environmental services, watershed development, wetland management and forest management from interdisciplinary development projects in Africa, Asia and Central America.

**Emmanuel Manichon** is a graduate of the Institut National Agronomique Paris-Grignon (France). He started with Nestlé in 1990 and held various positions in Sales, Marketing and Purchasing in France and abroad. 40 years old, he was appointed head of Nestlé Waters Vosges in January 2007, and is in charge of Nestlé's biggest water factory, the Vittel/Contrex/Hepar production site, including the local environmental initiatives such as Agrivair.



**Claudia Sadoff** is a Lead Economist with the World Bank, currently on external service as an Economic Advisor jointly appointed to the World Conservation Union (IUCN) and the International Water Management Institute (IWMI). She has 20 years of experience in international development, with expertise in the growth and poverty impacts of water resources policies, investments, incentives and institutions; and cooperation and benefit sharing in international rivers.

**Tobias Salathé** works at the secretariat of the Ramsar Convention on Wetlands where he focuses on implementation issues and provides partners with advice and support, mainly in Europe. Prior to this, he worked for the development of wetland-related programmes in the Mediterranean for the European Commission and the Tour du Valat Foundation. This followed his time as a programme manager for BirdLife International, as a conservation and communications consultant, and his earlier ecology studies.

**Sibylle Vermont** is Senior Scientific Officer at the Swiss Federal Office for the Environment, responsible for international policy on water, forests and wetlands. She also works in close cooperation with the UNECE Water Convention, especially on the role of terrestrial ecosystems in integrated water resources management, including on payments for ecosystem services.

A vertical photograph of a waterfall with multiple cascades, surrounded by green foliage, positioned on the left side of the slide.

# **Recommendations on Payments for Ecosystem Services in Integrated Water Resources Management**

Francesca Bernardini

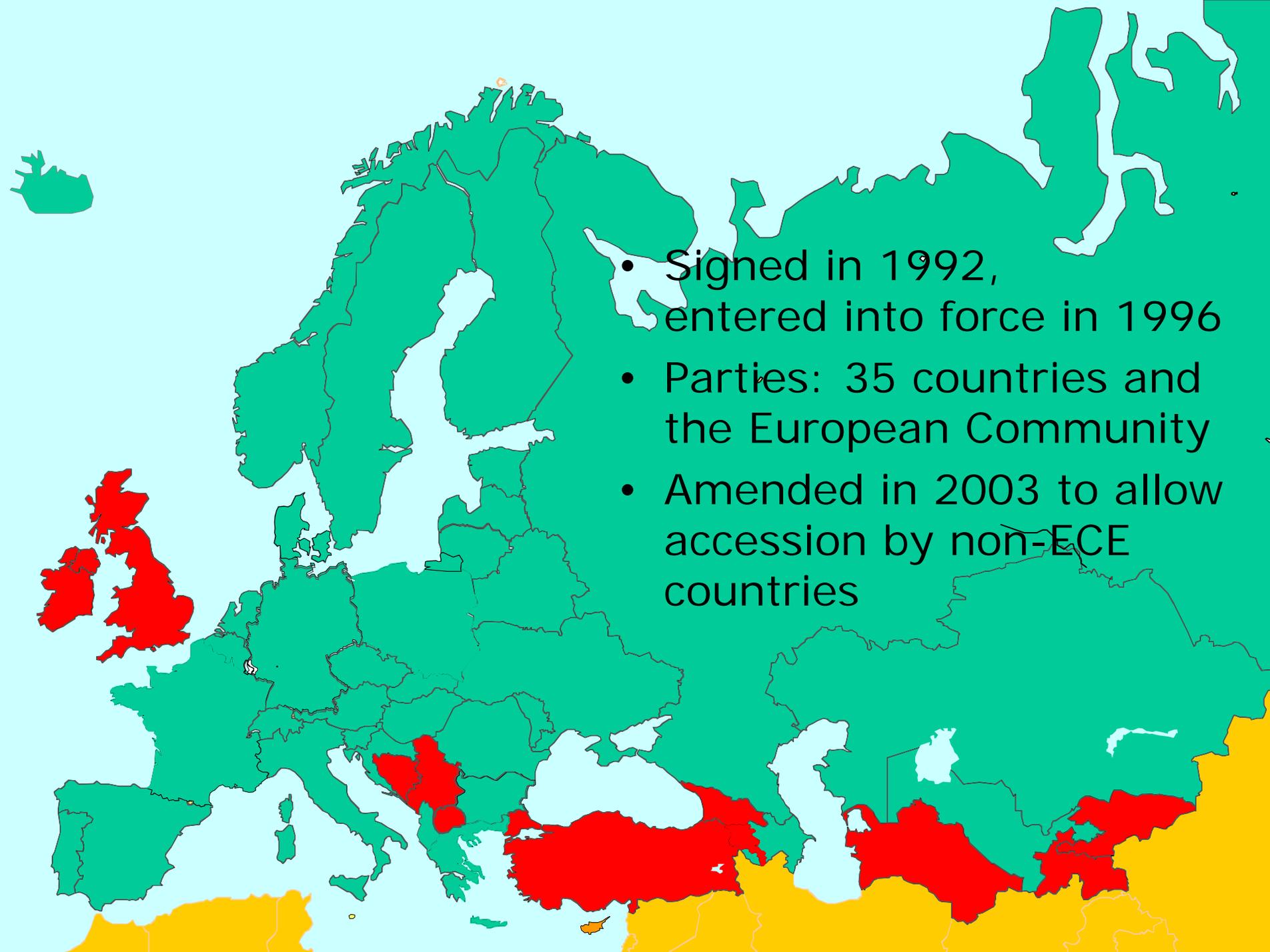
United Nations Economic Commission for Europe



# UNECE Water Convention

- Protection of transboundary waters by preventing, controlling and reducing transboundary impacts
- Ecologically sound and rational management of transboundary waters
- Reasonable and equitable use of transboundary waters  $\Rightarrow$  conflict prevention
- Conservation and restoration of ecosystems



- 
- A map of Europe and its surrounding regions. Countries are color-coded: red (Ireland, United Kingdom, France, Italy, Greece, Turkey, Bulgaria, Romania, and parts of the Balkans), green (Spain, Portugal, Germany, Poland, Czech Republic, Slovakia, Austria, Hungary, Switzerland, and Norway), and yellow (Greece, Turkey, Bulgaria, Romania, and parts of the Balkans).
- Signed in 1992, entered into force in 1996
  - Parties: 35 countries and the European Community
  - Amended in 2003 to allow accession by non-ECE countries

# Ecosystem approach in water management

- Progressive shift of focus: from aquatic to terrestrial ecosystems
- Ecosystem services for water management
  - flood prevention, control and mitigation
  - regulating runoff and water supply
  - improving water quality
  - withholding sediments and reducing erosion,
  - supporting water storage in the soil; and facilitating groundwater recharge
  - cultural services



# Seminar on the role of ecosystem as water suppliers

= > **Many good practices but no full implementation**

- Establishing partnership
- Getting better information
- Strengthening capacities
- National legislation and international agreements
- Innovative economic tools and financing



# Seminar on environmental services and financing

PES have the potential to be an environmentally effective, economically efficient and socially equitable tool for IWRM

- Internalize environmental costs or benefits into production and/or consumption decisions
- Improve the quality and facilitate integration of relevant policies at all levels
- Generate/broaden source of finance
- Create incentives for investments and environmental friendly behaviour
- Create watershed solidarity

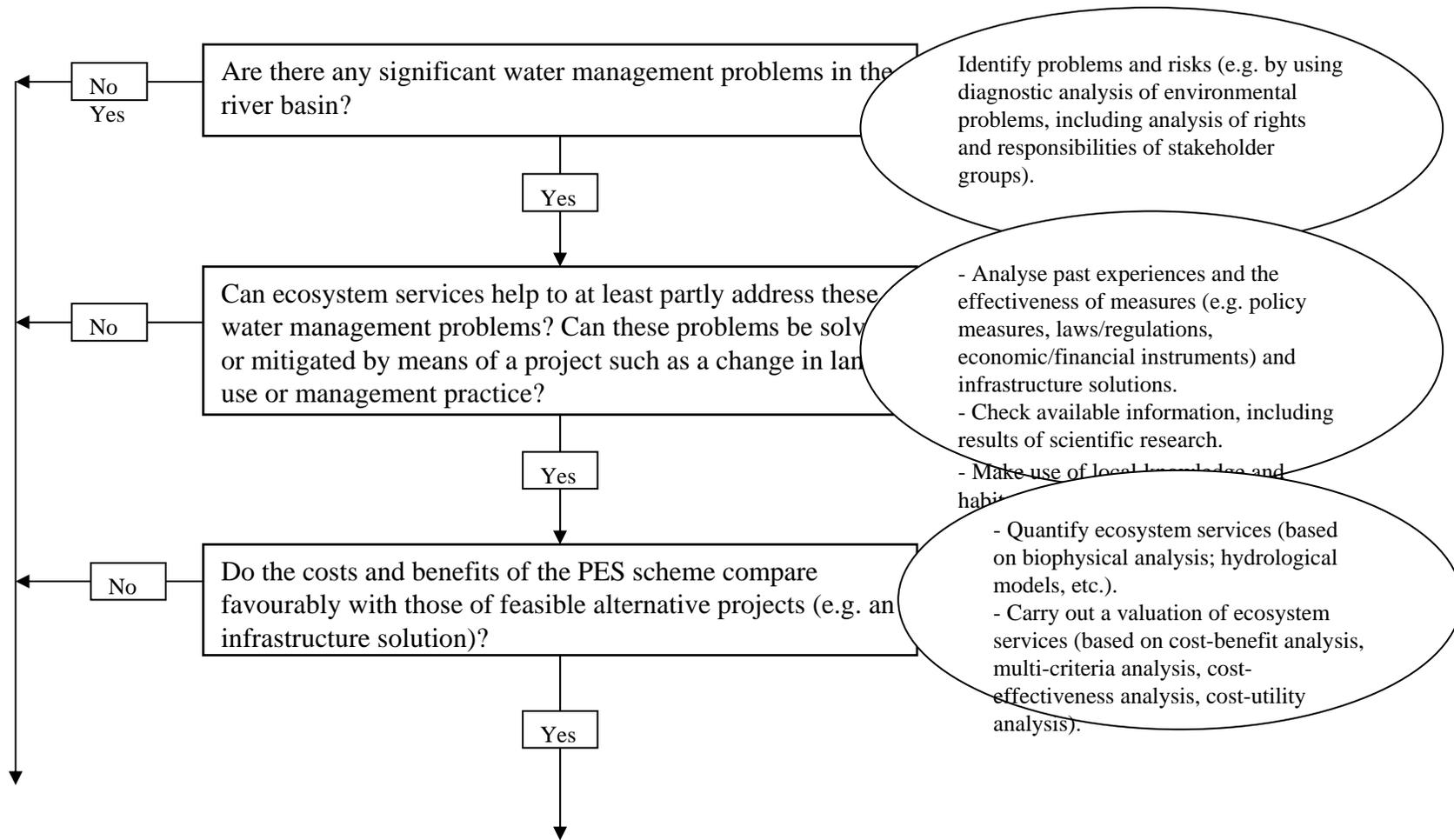


# UNECE Recommendations on PES

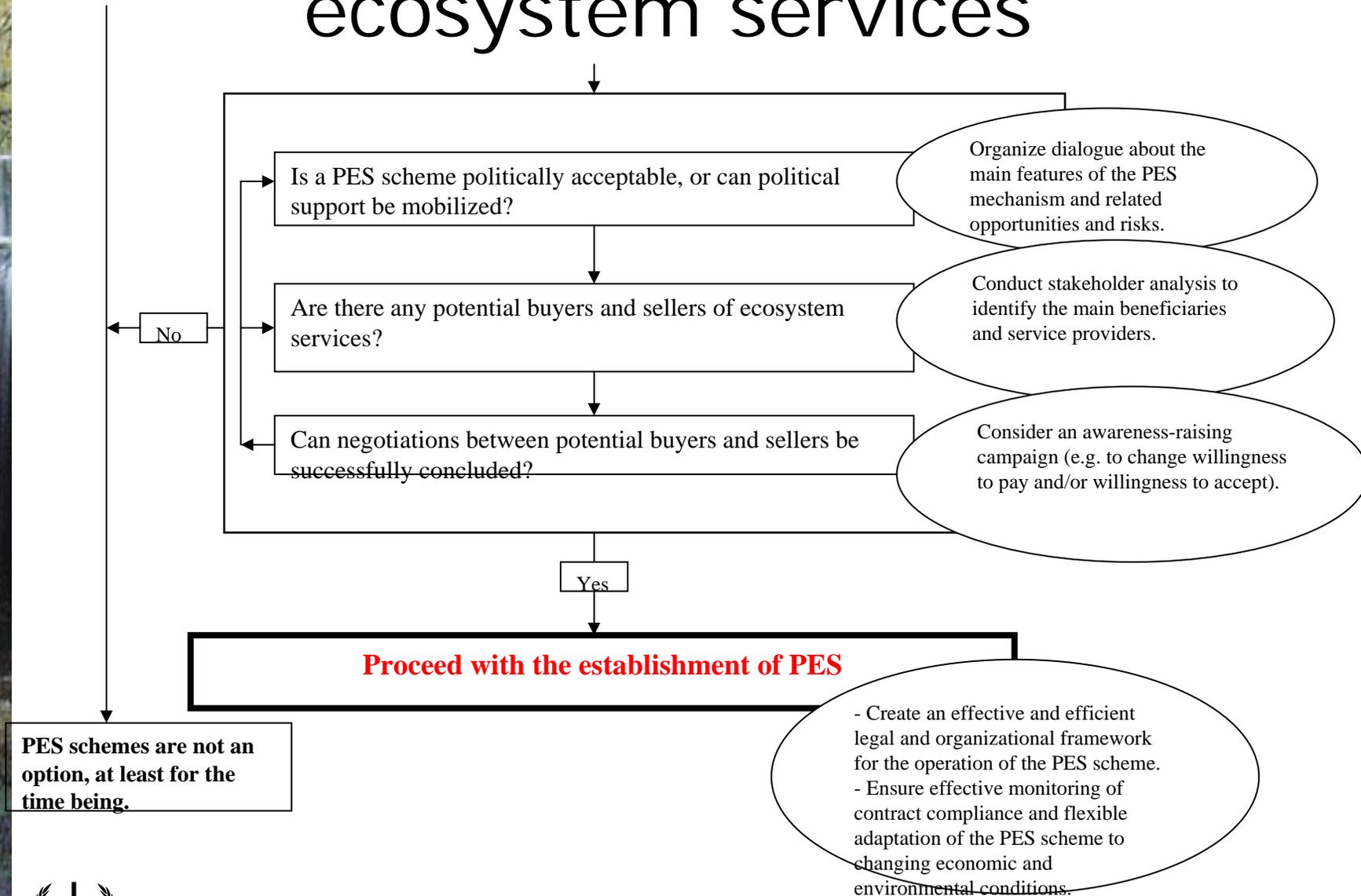
- Based on good practices from different sectors
- Aimed to support Governments at all levels as well as other actors (suppliers and users)
- Not only for the UNECE region
- PES are site specific, Recommendations identify basic rules



# Water management issues and ecosystem services



# Water management issues and ecosystem services



# Core principles for PES

- Adaptive learning process
- Environmental effectiveness, economic efficiency and social equity
- Transparency to support negotiation, trust and compliance
- Conditionality of payment
- Need for monitoring of the service and revisions of scheme



# Basis for PES establishment

- Stakeholders involvement
- Types of PES schemes and financial arrangements
- Legal and institutional frameworks



# Accompanying measures

- Information needs analysis and monitoring
- Awareness raising, communication and strengthening of capacities
- Research needs
- Financing



# The way ahead

- Adopted by the Parties to the Water Convention in November 2006
  - Promotion and capacity building activities
  - Further technical guidance
  - Implement and test them through pilot projects
- ⇒ Assess usefulness and implementation in 2009

**Need for continued cooperation with other sectors**



A vertical photograph of a waterfall with multiple cascades, surrounded by green trees and foliage.

# Thank you!

Recommendations available at  
**[http://www.unece.org/env/water/  
publications/pub74.htm](http://www.unece.org/env/water/publications/pub74.htm)**





# Paying Nature for Services Rendered: the case of water

Geneva Environment Network  
29 November 2007

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## **PES – More Than Marginal?**

Claudia W Sadoff  
Economic Advisor, IUCN  
Principle Economist, IWMI

# Outline

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1. A Concept That Works in Practice
2. Does it Work in Theory?
3. Two Challenges Looking Ahead



# A Concept That Works in Practice

## **Financing Watershed Conservation in Quito**

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**Fondo Nacional del Agua (FONAG) - National Water Fund**

### **Ecosystem services provided:**

Watershed conservation to enhance drinking water quality in the city of Quito

**Funding mechanism:** A non-declining endowment fund, solvent & growing

### **Buyers:** FONAG and its contributors

Quito water utility (EMAAP-Q) contributes 1% of water revenues

Electrical utility, \$45,000/ year

Contributions by FONAG, TNC, a brewery & the Swiss development agency

### **Sellers:** Watershed managers & advocates

Managers of forests, protected areas and agriculture

Developers of ecotourism, training, communication and environmental education

### **Elements for success:**

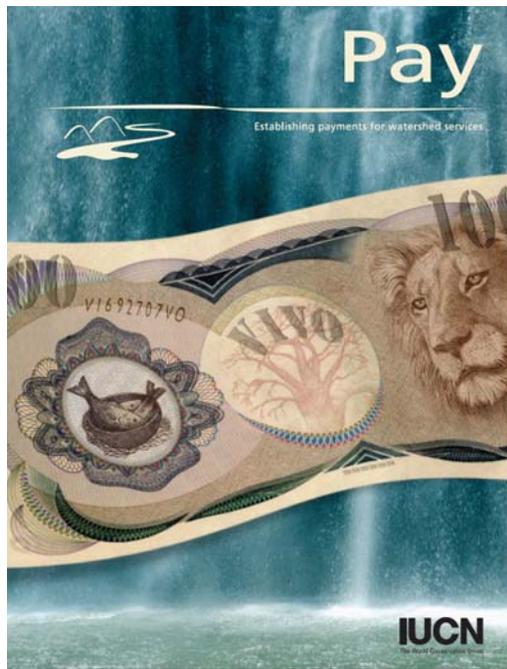
Strong political support – Mayor of Quito & other influential parties

Strong financial base – the two major water users (water & power utilities), NGOs, donors

Significant intermediation – from FONAG, TNC & more (IUCN in an advisory capacity)

# A Concept That Works in Practice

**Many demonstrated successes**



<http://www.iucn.org/dbtw-wpd/edocs/2006-054.pdf>

Location	Activities Compensated	Watershed Services Provided	Service Buyer	Service Seller	Price Paid (per ha. per year)
Murray Darling Basin, Australia	Reforestation	Salinity control Freshwater supply	Downstream farmers' association	Government and upstream landowners	\$45
Sarapiquí watershed, Costa Rica	Protecting, sustainably managing, and replanting forests	Hydropower Regulation of flows Sedimentation control	Energía Global (hydropower company) and National Fund for Forest Financing (FONAFIFO)	Private upstream landowners	\$48
Costa Rica	Protecting, sustainably managing, and replanting forests	Freshwater supply Wildlife habitat Cultural heritage and identity	National Forest Office and FONAFIFO	Private upstream landowners	\$45–116
United States	Soil conservation	Soil protection Sedimentation control Water quality control Regulation of flow	U.S. Department of Agriculture	Farmers	\$125
State of Paraná, Brazil	Watershed restoration	Freshwater supply Wildlife habitat	State of Paraná	Municipalities and private landowners	\$170
Rhine-Meuse Basin, France	Reduced-input farm management	Water quality control Freshwater supply	Perrier Vittel (private bottler of mineral water)	Upstream farmers	\$230

# Outline

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1. A Concept That Works in Practice
2. Does it Work in Theory?
3. Two Challenges Looking Ahead



## The Concept, in Theory

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- **Internalizing (positive) externalities of ecosystem management**  
The opposite of 'polluter pays' & just as fundamental
- **The case of water: 'basinwide' is best**  
The geography of the water cycle usually ensures a separation between providers & beneficiaries – opportunities for PES

**Theory points to broad market failures.**

**How far does practice take us in achieving this?**

# Does it Work in Theory?

## What does PES look like in practice?

Targeted direct transactions between buyers & sellers of ecosystem services (with some important exceptions)

### In practice must have:

- Need clear, site specific science (what we are selling?)
- Cover high, often hidden, transaction costs (what we are spending?)
- Find willing buyers/sellers (without a regressive wealth impact)
- Need reasonably robust institutions, tenure rights, rule of law, etc.

It is an excellent tool, in very specific settings...

## What about everywhere else?

- Transactions-focused PES is one (usually small-scale) tool for a large-scale challenge
- Fails to capture multifunctionality
- The construct needs broad application – not just ad hoc
- Perverse economic signals & incentives are everywhere & overwhelming

# Does it Work in Theory?

## How could PES be applied broadly (in theory)?

- Water pricing (all water, to motivate & finance ecosystem management)
- Sectoral planning & management (Swiss model, structuring trade-offs)
- Macroeconomic analysis & planning (GNP, Genuine savings)
- River basin management & benefit sharing (payment in-kind)
- Trade regimes (including global carbon)

A mixture of uphill battles & untapped opportunities

# Outline

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# Two Challenges Moving Ahead

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## #1 Keep Refining PES Mechanisms

**Efficiency** – costs are often hidden, need rigorous economic analysis

**Equity** – is often assumed, seek to incorporate poverty goals

**Institutions** – are often ad hoc, ensure local demand & ownership

**Scalability & replicability** – evidence is unclear

→ **Be pragmatic about limitations**



## Two Challenges Moving Ahead

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### #2 Move Beyond the Marginal

**Leverage the concept & expertise of PES** in other debates around more systematic incentives

**In national economies & the global system** seek to align broader incentives, Doha Round, carbon & climate change, international rivers

**→ Be bold & innovative about opportunities for PES**  
(in theory)



Thank you.





paying nature for services rendered

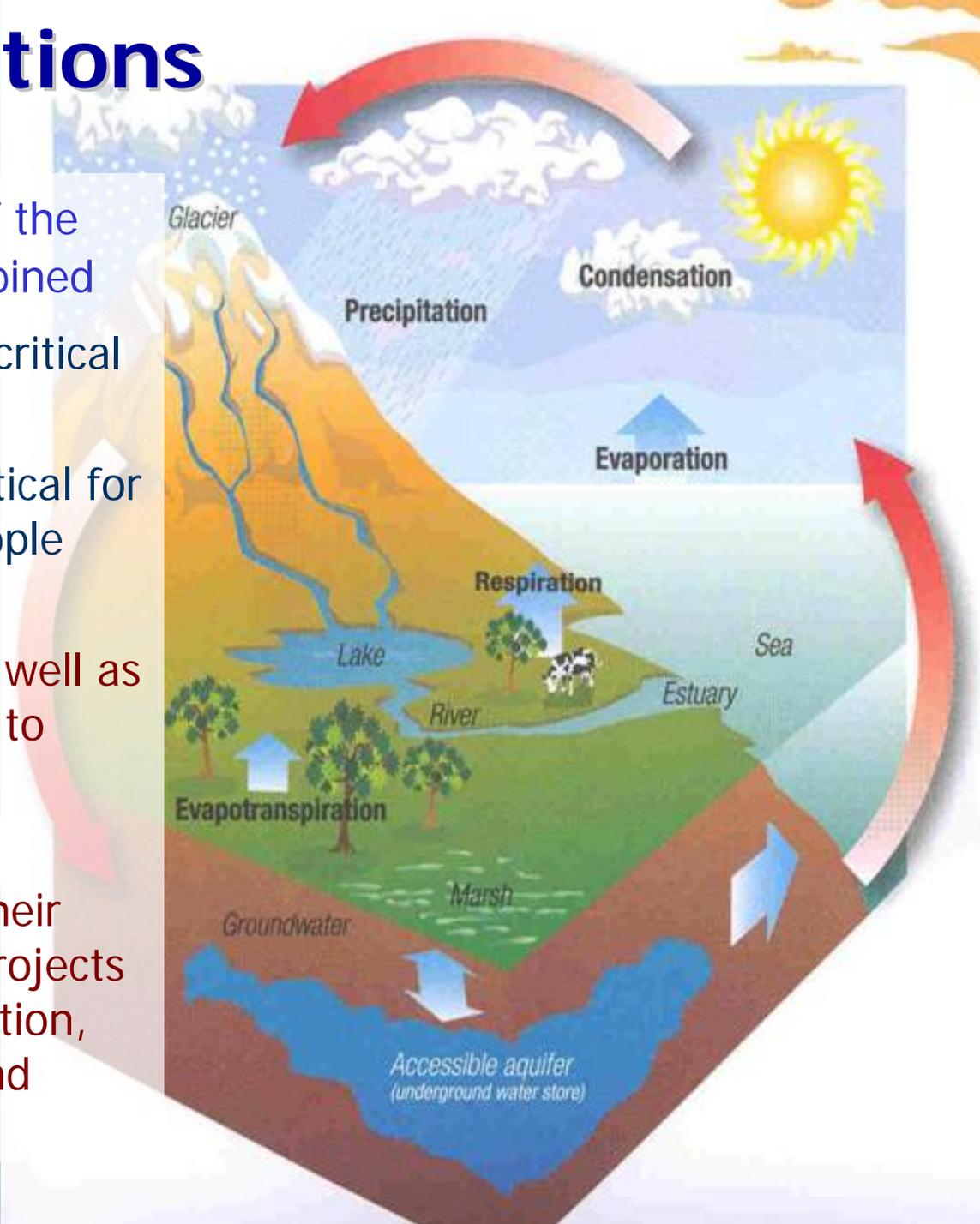
*8 perspectives for*  
water-related ecosystems



Ramsar Convention  
on Wetlands

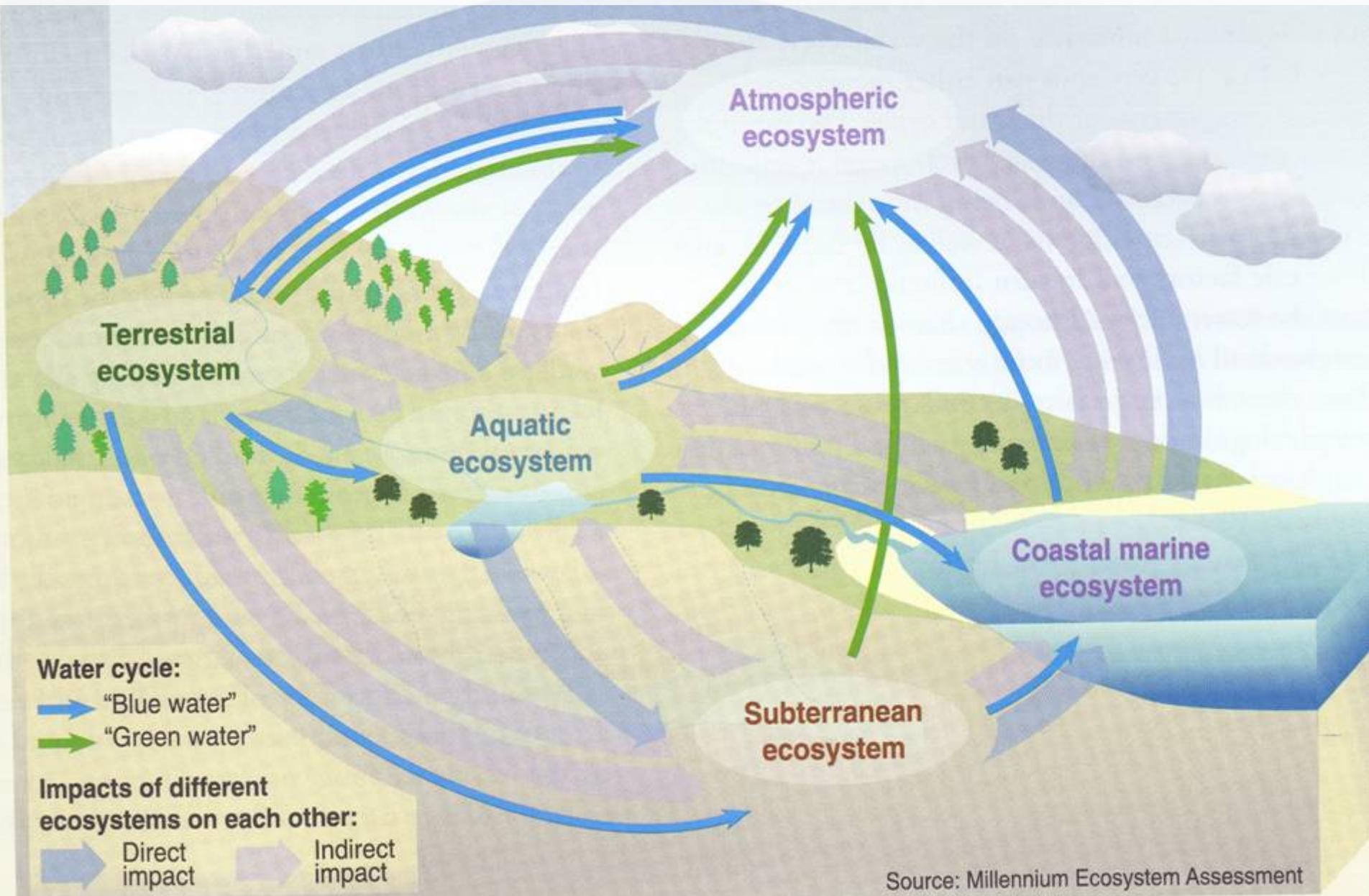
# Ramsar Resolutions

- wetlands account for half of the **value** of all ecosystems combined
- wetland ecosystems play a critical role in **water management**
- **wise use** of wetlands is critical for the provision of water for people and nature
- wetlands are a **source** - as well as a **user** - of water, in addition to supplying a range of other ecosystem **services**
- maintaining wetlands and their **functions** in water-related projects contributes to **poverty** reduction, sustainable **development** and **biodiversity** conservation



# 1) fundamental: use a **Catchment Basin Approach**

the **hydrological cycle** supports and links all environmental components



A background image showing a calm lake in the foreground. In the middle ground, there is a house with a porch and a fence. Behind the house, there are several large, leafy green trees. The sky is a pale, overcast grey. The overall scene is peaceful and natural.

**provisioning:** food, fresh water, fiber, fuel, biochemical and genetic materials

**regulating:** climate, water flows, water purification, waste treatment, erosion, natural hazards, pollination

**cultural:** spiritual, inspirational, recreational, aesthetic, educational

**supporting:** soil formation, nutrient cycling

2) recognize the services



**willingness to pay** can only be increased if **additional benefits** can be demonstrated *against* established baselines, business as usual or the status quo

PES are better accepted under **environmentally degraded** conditions

**3) integrate environmental services and costs**



**3,000 USD/ha y:** Waza Logone floodplain (Cameroun)  
fisheries, crops water supplies

**5,820 USD/ha y:** mangroves (Fiji)  
water purification

**22,000 USD/ha y:** coastal wetlands (Rep. Korea)  
fisheries, waste treatment, aesthetic functions

**2,600 USD/ha y:** urban marshes (Sri Lanka)  
water supplies, water treatment, flood attenuation, fisheries

**4) need to value the services**



link **upstream** services with **downstream** users

Ramsar's « **critical path** » to link catchment basin planning with local ecosystem management

define objectives and **benefits** to focus investments

**5) link ecosystem services with good water management**

A photograph of a modern cable-stayed bridge with a white pylon and yellow cables, spanning a wide river. A white boat is visible on the water below the bridge. In the background, there are power line towers and a forested hillside under a clear sky.

define **benefits** and their **costs**

find **sellers** and **buyers**

**pay** directly **for the service**, but only if it is actually delivered (cf. agricultural subsidies)

6) **establish contracts**

difficulty to establish **markets**

analyse who is actually **paying** (directly – indirectly)

establish schemes, and assess **compliance** with them

**evaluate** if objectives are attained

7) **public vs private agreements**





**communicate**, inform, educate, share information

undertake local **valuation** studies

need to design **payment** schemes

**assess** their outcome – and communicate this to **new**  
potential **buyers** and **sellers**

**8) need for grassroots  
development efforts**

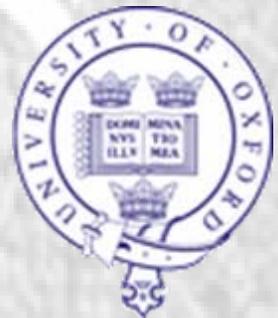
# Enterprise, development and water ecosystem management: lessons and policy implications



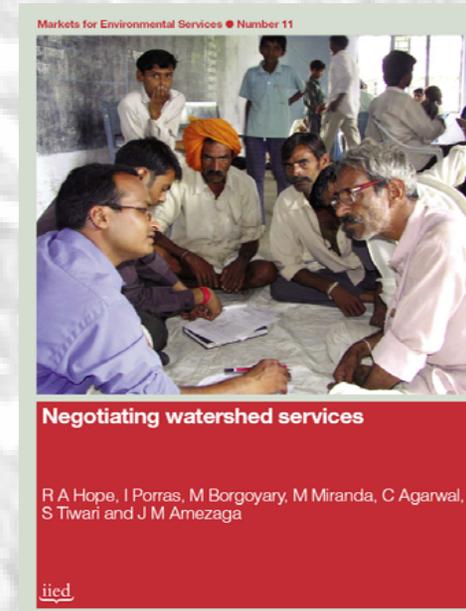
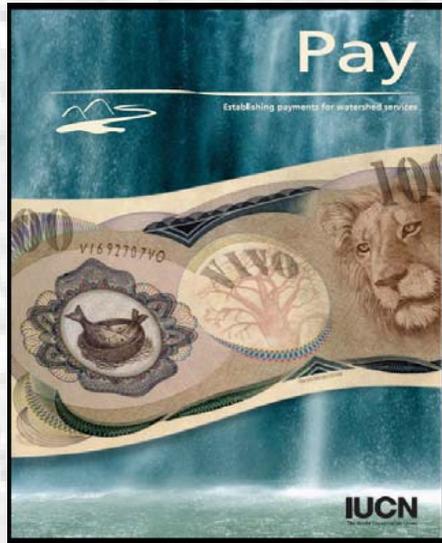
***Paying nature for services rendered - the case for water***

UNEP, Geneva Environment Network, November 29<sup>th</sup>, 2007

Dr. Rob Hope, Oxford University Centre for the Environment, UK



# Paying nature for water services ... or selling out on nature and the poor?



Vol 443/7 September 2006

nature

## COMMENTARY

### Selling out on nature

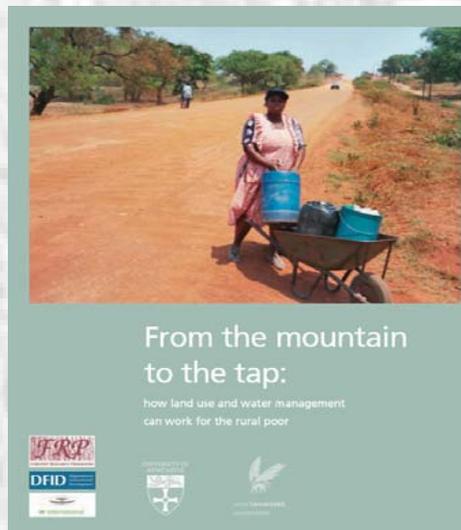
With scant evidence that market-based conservation works, argues Douglas J. McCauley, the time is ripe for returning to the protection of nature for nature's sake.

Probably the most important trend in conservation science at the moment is 'ecosystem services', typically seen as economic benefits provided by natural ecosystems<sup>1</sup>. They form the basis of most market-oriented mechanisms for conservation. The underlying assumption is that if scientists can identify ecosystem services, quantify their economic value, and ultimately bring conservation more in synchrony with market ideologies<sup>2</sup>, then the decision-makers will recognize the folly of environmental destruction and work to safeguard nature.

But market-based mechanisms for conservation are not a panacea for our current conservation ills. If we mean to make significant and long-lasting gains in conservation, we must strongly assert the primacy of ethics and aesthetics in conservation. We must act quickly to redirect much of the effort now being devoted to the commodification of nature back towards instilling a love for nature in more people.



L.E. AUSTIN/CORBIS IMAGES

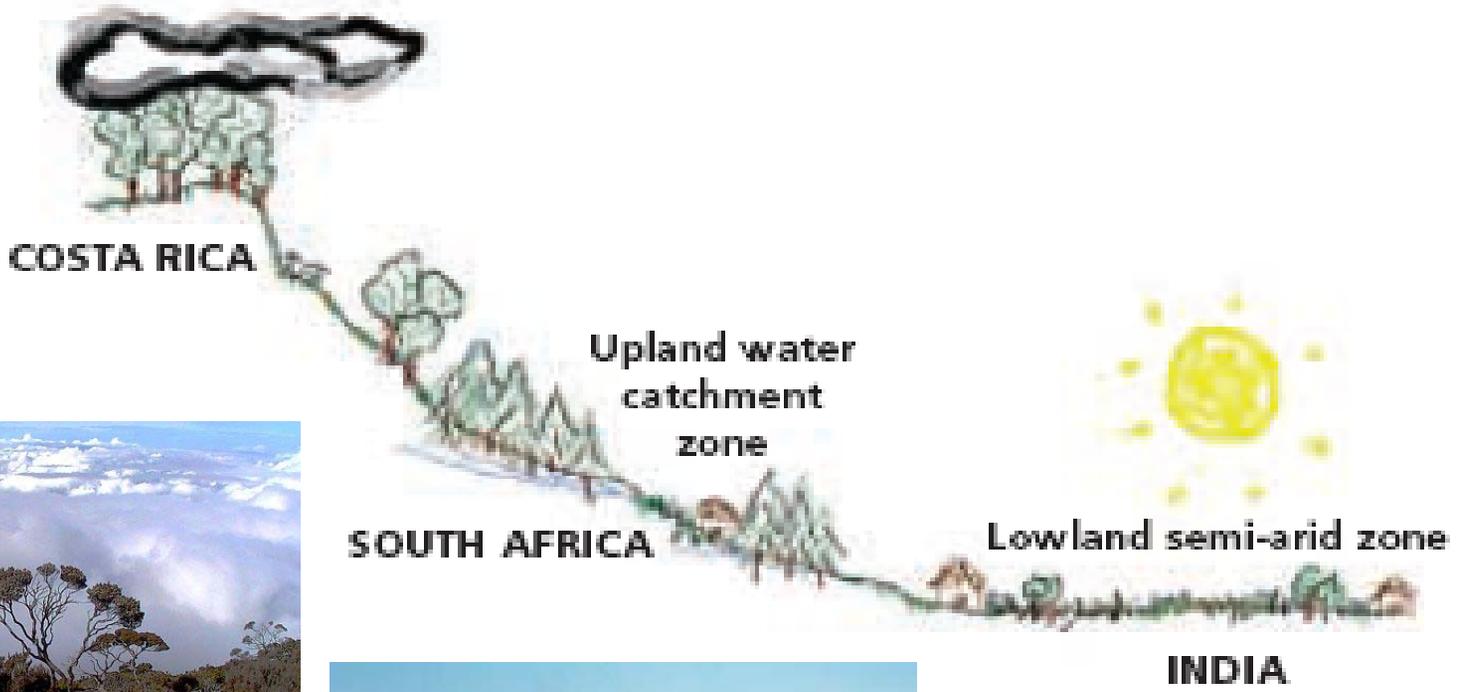


### Negotiating watershed services

R A Hope, I Porras, M Borgoyary, M Miranda, C Agarwal, S Tiwari and J M Amezaga

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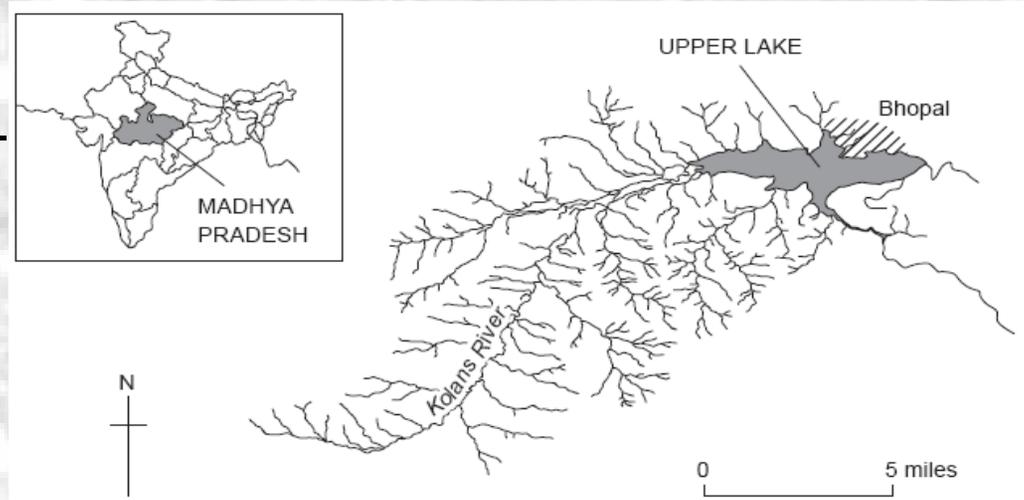
**Tropical montane  
cloud forests**



# Lesson 1: Market-based approaches can promote state and non-state institutional cooperation and investment

## ***Policy implication***

- At the Bhoj wetland, upland agro-chemical run-off pollutes the Ramsar wetland site that provides 40% of Bhopal's drinking water needs.
- Interested govt and business actors have 'joined hands' to explore organic farming innovations that convert urban waste to nascent organic land management in the upper Kolans watershed.



## Lesson 2: Poor people are often unlikely to benefit from payment schemes

### ***Policy implication***

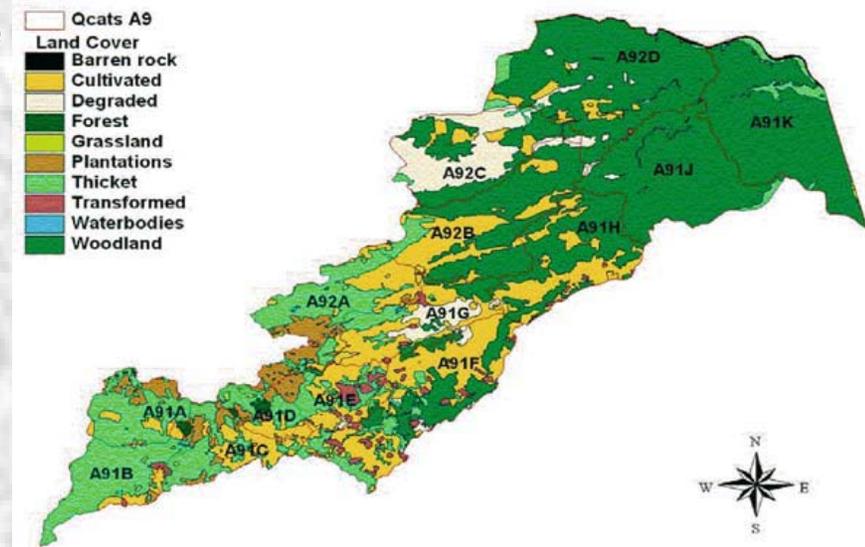
- Many poor people are landless or land insecure limiting their ability to participate in payment schemes.
- Care must be taken that perverse outcomes do not make such vulnerable groups worse off due to incentives for elite groups to capture environmental goods and services that support their livelihoods.
- Putting a 'price' on water may result in formalising rights to more powerful actors excluding informal or customary rights.



# Lesson 3: Hydrological evidence is necessary to promote the enduring nature of any agreement

## ***Policy implication***

- Establishing burden of proof is complicated by significant difficulties in obtaining reliable and credible evidence.
- Issue-based groups can motivate public opinion before satisfactory evidence is provided.
- The Working for Water programme in South Africa is based largely on good scientific evidence of both hydrological, biodiversity and fire hazard benefits.



# Lesson 4: Policy action should be informed by objective information on public preferences in the design phase with adaptive management systems

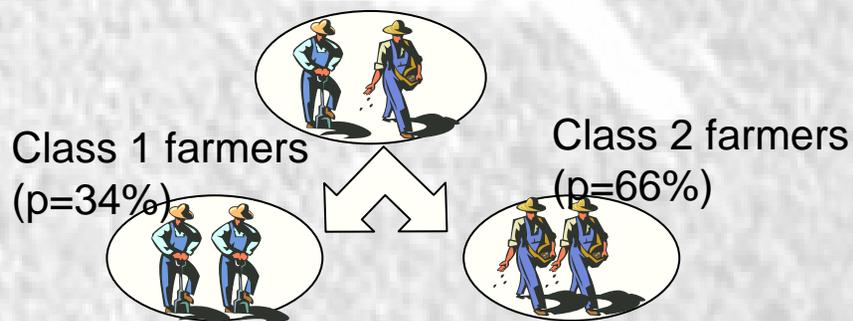
## Policy implication

- Choice experiment analysis from the Bhoj wetland indicates that with the right incentives and institutional support farmer land management decision-making can be changed;
- Land certification may provide a self-enforcing institutional arrangement for land management change. This will require transitional financing and capacity-building for farmers shifting to organic production and reduce long-term transaction costs and monitoring of off-site water quality impacts from agricultural runoff.

Card 6 Set 5

	# 1	# 2	# 3	# 4	# 5
LAND COMMITTED TO ORGANIC FARMING	25% 	50% 	75% 	100% 	CURRENT SITUATION (Q.4/5)
ORGANIC CROP PRICE INCREASE PER 100 RUPEES	 \$13	 \$9	 \$7	 \$11	?
COST OF CERTIFICATION PER ACRE	 \$3000	 \$3000	 \$3000	 \$1000	?
PRICE COMPOST TROLLEY (2 tonnes)	 \$1200	 \$1200	 \$1500	 \$900	?
FARMER DAYS TO COMPOST ONE TROLLEY	 12	 16	 16	 4	?
VOTE FOR ONE ONLY					

Yield  ↓      \$Fertiliser  ↓



# Conclusions and future directions

Paying nature for water services may be considered as a strategic policy approach in different contexts if:

- land and water management changes are desirable and socially-acceptable,
- negotiating institutional change is feasible, and,
- interventions and investments are expected to offer high returns with low (opportunity) costs.

Monitoring and evaluating distributed impacts on social and environmental change are critical to:

- improving the design of such schemes,
- identifying successful approaches, and,
- guiding future initiatives/investments.



# Agrivair

## Presentation of a water preservation programme

Geneva November 29 2007  
Emmanuel Manichon



# Agenda:

1. **The business interest for Nestlé Waters**
2. **Lessons learnt and criteria for success**
3. **Agrivair, and PES**



# Agenda:

- 1. The business interest for Nestlé Waters**
- 2. Lessons learnt and criteria for success**
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## Nestlé Waters: A global player

- **Water Division of the Nestlé Group, accounting for approximately 10% of sales**
- **Number 1 player on the bottled water market in both volume and value**
- **Present in 130 countries / 37 operating companies**
- **A unique portfolio of 72 brands**



# The specificity of Natural Mineral Waters

**Natural Mineral Water can be distinguished by:**

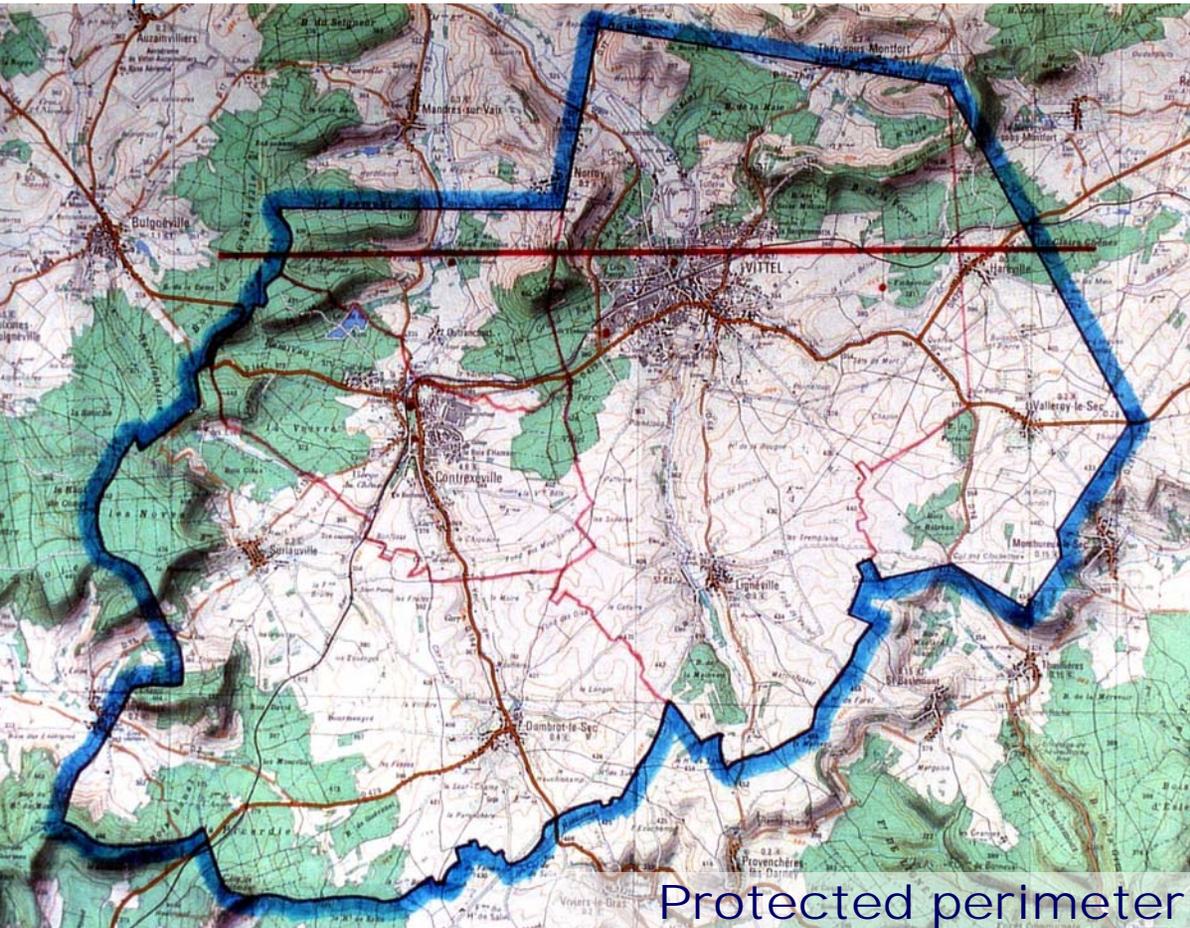
- **The stability in mineral content over time**
- **Coming from an underground water source, protected from risk of pollution**
- **As such, treatment is restricted**
- **Natural mineral water must be bottled at source**

EU Directive 80/777/CEE / 90/70/CE

Codex STAN 108-1981, rev1997

The logo for Contrex, featuring the brand name in a stylized font with a pink heart shape above the 'e'.The logo for HÉPAR, with the brand name in a bold, serif font and the words 'EAU MINÉRALE NATURELLE' in a smaller font below it.The logo for Vittel, consisting of the brand name in white text on a red vertical rectangular background.

# The specific local context



Protected perimeter



**CONTREX**      **VITTEL**

<b>Farming area</b>	<b>2,500 ha</b>	<b>3,600 ha</b>
<b>Parks and Golf courses</b>	<b>25 ha</b>	<b>600 ha</b>
<b>Built-up area</b>	<b>600 ha</b>	<b>400 ha</b>
<b>Forest</b>	<b>975 ha</b>	<b>400 ha</b>
<b>TOTAL</b>	<b>4,100 ha</b>	<b>5,000 ha</b>



# Agenda:

1. The interest for Nestlé Waters
2. **Lessons learnt and criteria for success**
3. Agrivair, and PES



# A good starting point; motivation, partners, information, feasibility

## ■ Sustainable motivation:

- Make sure the project makes economical sense for everyone involved, now and in the future
- Long term commitment in a dynamic/changing environment

## ■ Committed partners (*INRA, CNRS, CEMAGREF, Agences de l'eau*)

## ■ Solid background research

- Steering committee led by *INRA*
- 30 researches

## ■ Feasibility



## Definition and agreement on methodology (1)

A four step methodology was developed:

- **Understanding** the farming systems and why farmers do what they do
- **Analysing** conditions of changing farmers' practices and behaviour
- **Experimenting**, test, and validate in farmers' fields the management practices necessary to reduce the nitrate threat
- **Research** tools and indicators to support the change



## Definition and agreement on methodology (2)

### Inventory and analysis of the farms:

	A	B	C	D
<b>Farms number</b>	4	8	12	13
<b>Surface</b>	≈ 19 ha	< 50 ha	< 135 ha	> 135 ha
<b>Turnover</b>	≈ 200 000 F	≈ 500 000 F	≈ 1 000 000 F	> 1 000 000 F
<b>Production system</b>	Diversified rearing	Milk	Milk + meet	Milk + meet + cereals
<b>Fodder system</b>	Hay	Hay + A little of corn	Hay + corn	Hay+ corn
<b>Debt level</b>	No	No	High	High
<b>Succession</b>	None	Not sure	Sure	Probable
<b>Age of the farm manager</b>	> 50 years	> 50 years	≈ 41 years	< 40 years

## The Agrivair Guidelines: 360° approach to protect water

- 1- Elimination of corn cultivation**
- 2- Composting manure**
- 3- Maximum 1 cattle unit / Ha / year (i.e.: 1 dairy cow)**
- 4- No pesticide**
- 5- Putting in place a lucerne-based cultivation turnover**
- 6- Balancing the animals intake**
- 7- Put farms buildings in accordance with standards**



# Tools to support change

## 1. Technical and change management support

1. Free of charge for the farmer
2. Annual fertilization plan
3. Cultural rotation plan
4. Cattle feeding adjustment
5. Compost generation & utilization



# Tools to support change

## 2. Financial support

- 200 euros per hectares subsidy for 5 years
- Payment for new buildings, equipment
- Costs related to land acquisitions
- In total, an average of €2 Mios/year invested



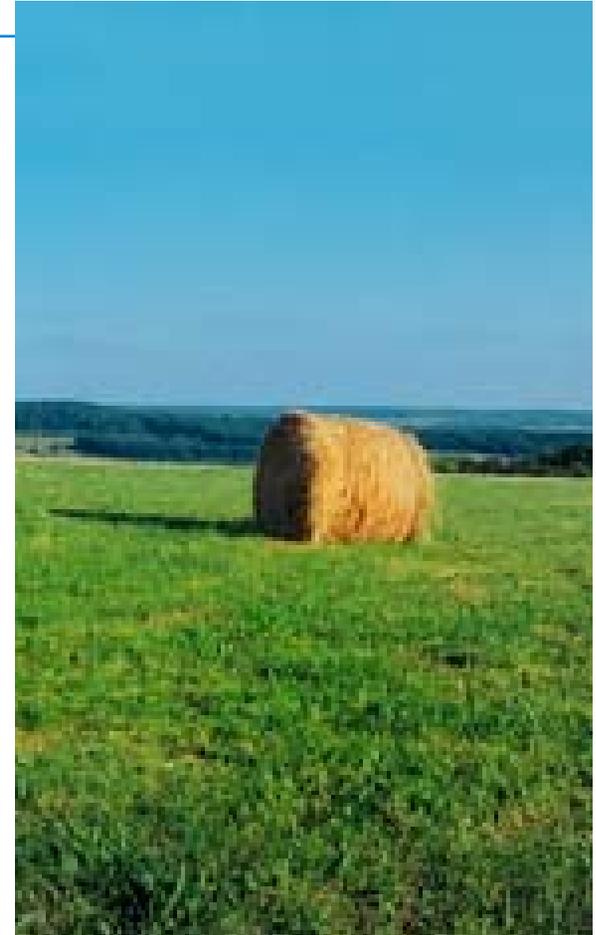
# Agenda:

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## Agrivair – a PES case?

- Agrivair → 1989
- IIED study
- Approach feasibility:
  - Case by case
  - Local situation and demand
  - Win-win situation
  - Dynamic system:  
Anticipating & Monitoring  
changes over the years





**Thank you!**

