Humanity has long prospered by running down the planet’s natural capital. Can it now invent new ways of developing the economy both for and from biodiversity and find sufficient scientific, technical and financial resources to preserve and repair ecosystems? The aim of Caisse des Dépôts’ Mission Économie de la Biodiversité, which was launched in 2012, is to investigate the relationship between economics and biodiversity and come up with concrete responses to such questions. It is part of Caisse des Dépôts’ drive to promote biodiversity which has already resulted in the creation of CDC Biodiversité, the signature of the Natural Capital Declaration at Rio+20, and a commitment to France’s National Biodiversity Strategy.

The Mission Économie de la Biodiversité has a fact-finding and research and development brief. It is funded by Caisse des Dépôts and is part of CDC Biodiversité. It has a world class Scientific Committee and welcomes cooperation and partnership arrangements with other research bodies. The fruits of its labours will be widely circulated to the men and women who seek answers to these types of questions and the Unit will focus on the best ways of devising concrete, applicable initiatives and solutions, with particular emphasis on biodiversity offset projects, payment for ecosystem services and positive biodiversity outcomes.

This newsletter is one means of circulating this information. We have called it Biodiv’2050 and this time horizon is important for two reasons. First, in order to get a temporal perspective because, where natural spaces are concerned, the impacts of our work would generally be measured in decades, e.g., planting a forest, preventing erosion of unstable land, re-establishment of natural successional trends, etc. Second, because studies carried out by the IPCC and the French agronomics institute (INRA) point to 2050 as a turning point in the relationship between climate change and natural spaces. The second-half of the twenty-first century would appear to herald the dawn of a new environment to which present-day ecosystems are ill-adapted. This gives us a rough idea of how much time we have to put our house in order and prepare insofar as possible for this adaptation. We are open – as of now – to any ideas or proposals related to the Unit’s brief or scope of activities.

LAURENT PIERMONT
Chairman, CDC Biodiversité
Economic crisis, ecological crisis: where do the opportunities lie?

Joint discussion between Gilles Boeuf, President of the Muséum National d’Histoire Naturelle and Jacques Weber, economist and anthropologist, retired director of research at CIRAD.

Payment for Ecosystem Services in France: from the virtues of the concept to the challenges of implementation.

Spotlight: how to reconcile biodiversity and profitable forests: an innovative example from the Landes region.

Biodiversity, the new future for cities?

Inventing new financing solutions for re-establishing ecological networks.

Caisse des Dépôts: first French signatory of the Natural Capital Declaration.

A first step towards environmental accounting?
Analysis of an environmental profit and loss account prepared by the German subsidiary of the Puma group, by the economist Michel Trommetter.

Towards a French network on payments for environmental services? By Alain Karsenty, socio-economist at CIRAD.

Presentation of the Conservation Finance Alliance international network.
Economic Crisis, Ecological Crisis: Where Do the Opportunities Lie?

A debate between two thinkers from two different domains – economics and ecology – involving enlightened and radically innovative ideas on how to surmount the current crises. Joint discussion between Gilles Boeuf, President of the Muséum National d’Histoire Naturelle and Jacques Weber, economist and anthropologist, retired director of research at CIRAD.

Europe is currently grappling with economic, financial and ecological crises. In your opinion, to what extent are these crises interrelated?

JW: There is no economic and financial crisis – we are dealing with the first major ecological crisis that humanity has had to confront. The symptoms are economic and financial – but they are only symptoms. Until we have understood that the real underlying sickness consists of an ecological crisis, the current situation will go on and on, lurching from one emergency to the next, from financial crisis to austerity plan. The cost of this crisis can be measured in social terms, in the rising numbers of unemployed and distressed populations. Huge resources have been thrown into resolving the financial crisis but one mess follows another: from Ireland to Cyprus, and from Cyprus to somewhere else before too long. This is what happens when we treat the symptoms instead of the causes.

So you think there is a misunderstanding?

JW: No, there’s an inversion, a refusal to see straight. I have said all this in front of national elected representatives, politicians and trade unionists, but there is a form of autism!

GB: To add to what Jacques said, I would agree that what we are currently experiencing is indeed an ecological crisis but it is also accompanied by a crisis of arrogance. When I hear people saying that we are going to fix everything by simply reverting to a system of domination over nature, forgetting that we are just one species among many (and pretty close to chimpanzees at that!), we’re going to run out of track pretty fast. We could be leveraging an innovative and much more humble approach based around an observation of the living world. I love when Jacques says: “start by helping economists to resolve their problems using an ecological approach and not the other way around”.

The current system of production and consumption outstrips the capacity of ecosystems to produce resources and absorb our waste. Is it still possible to reconcile economic development goals with protection of biodiversity?

GB: I believe that you need to look at the facts of the current situation. The biodiversity that is currently present on the surface of our planet, produced by millions of years of evolution, has given us a range of abundant - but limited – natural resources. The major problem today is the constantly increasing anthropogenic pressure on living matter, forcing us to exceed the replenishment thresholds of these renewable natural resources. Take forests or fisheries which are harvested as if they were infinite, inexhaustible resources. How will living matter react to these steadily increasing pressures? By adapting to them! We can observe such adaptability in fish stocks: while the animals are now capable of reproducing when they are twice as young, they lay smaller eggs, which hatch smaller individuals, so this ends up being counter-productive both economically and ecologically. When we observe past imbalances created by humanity, we realise that it always took just one last straw to break the camel’s back: just a tiny bit more pressure and the whole system collapses. In June 2012, an article in Nature, one of the most prestigious scientific journals, revealed that there had been a change in the modus operandi of 50% of all ecosystems, i.e., a fundamental, irreversible shift in their activities towards new systems that do not provide the same ecological services. We therefore need to tackle these current issues against a backdrop of population increase and development of human activities in order to manage resources in a sustainable manner.

JW: The erosion of biodiversity is gathering pace and we are living in an accelerating phase but, as Robert Barbaut puts it, biodiversity is like a library of innovations
“Biodiversity is not just bees and baby pandas! It is first and foremost 70% of the raw materials, and between 30% and 40% of the technologies all around us!”

Given this context, what recommendations would you make to firms who still do not know how to integrate biodiversity into their businesses from an operating perspective but wish to remain competitive?

JW: Biodiversity is not just bees and baby pandas! It is first and foremost 70% of the raw materials and between 30% and 40% of the technologies all around us! Biodiversity is not some external constraint of which we have to be careful, it is the sine qua non of economic production and profitability and we need to look after the availability of these means of production. Similarly, the impacts on living organisms should not be viewed as external constraints but rather as costs of production. A good manager minimises production costs to maximise profit. This needs to be clearly explained to firms in a factual way to get them to incorporate biodiversity into the vernacular of corporate jargon.

GB: For a while now, I’ve been meeting more and more entrepreneurs and realising that things have changed a lot and that we really do want to know each other better. I think that the Grenelle environmental conference was a really good thing. Business has to understand that biodiversity is a formidable resource for economic survival – take a look at the book written by Robert Barbault and Jacques Weber, “La vie, quelle entreprise!” (“Life, what a great business!”) – as well as brand image and a firm’s ability to woo future customers. We also need to be thinking about the organisation of systems and the links between economics and biodiversity: all projects should avoid or reduce environmental waste or offset the waste that remains. Lastly, we now need to focus all of our efforts on real applied and cross-disciplinary research in ecology and economics. Scientific articles should start bringing together ecologists, economists, sociologists as well as philosophers, who are always useful for stimulating reflection.
Dominique Dron - former General Commissioner for Sustainable Development – stresses that one of the challenges in switching to ecological practices is to identify processes that are sufficiently powerful to channel long-term investment flows in the direction of performance. In your opinion, what are the conditions for a successful ecological transition?

JW: We cannot really speak about ecological transition unless we define where achieving such a transition would leave us and it is remarkable how such as post-transition outcome is never defined in French debates. How can we envisage a transition to an undefined and therefore intangible state? Let us start from where we are now: wealth can only be produced by running down ecosystems because most of a business’ expenses are labour-related. However, what is drawn from nature is free, leading to overexploitation of natural resources: only scare resources are saved. Based on this observation, what suggestions can we make for defining a post-transition state? I can provide part of the answer: by transferring all or part of labour-related charges to what is drawn down from nature and what constitutes the economy’s finite raw material. Therefore, because it is finite, constant, which means shifting charges from one part of a system to another without actually changing them. This would be enough to change behaviours but it will not be easily accepted by businesses even though most of them actually agree with the analysis. They cannot do anything before the regulatory context changes as that would be economic suicide, but if regulations evolve they will adapt along with them. This is what I mean by a proposal for exiting the current crisis and I think that this is what Dominique Dron means when he talks about powerful processes.

GB: I am actually convinced that we need to ascertain whether we are capable of loving, understanding and observing more effectively this nature to which we are so closely bound. The human body contains 10 to 100 times more bacteria than human cells. Each and every one of us is an ode to biological diversity but few of us actually realise this. Our organisms are two-thirds water and our blood contains iodine from the ancestral oceans so if we have no bond with living matter, what exactly are we? Once we accept this, we can change our outlook and adopt a more cooperative mindset. I often point out that we only consume what is biological and we only cooperate with what is biological and this is why I’m particularly interested in what is known as bio-inspiration. Nature optimises systems by leveraging its exceptional adaptation capacities: we should look around us instead of trying to reinvent everything! We just need to invent new, much more effectively optimised technologies by looking at living organisms and the economic and social benefits will follow immediately! Ecological transition is contingent on this change of mindset: realising how deeply embedded humankind is in the living matter from which it has emerged.
**UNDERSTANDING PAYMENT FOR ECOSYSTEM SERVICES IN FRANCE: FROM THE VIRTUES OF THE CONCEPT TO THE CHALLENGES OF IMPLEMENTATION**

Payments for Environmental or Ecosystem Services (PES) are an economic instrument for biodiversity conservation currently at the forefront of scientific and political debates. In the following article Aurélien Guingand, economist at the Mission Économie de la Biodiversité, clarifies the key issues and opportunities related to this mechanism.

In line with the recommendations of The Economics of Ecosystems and Biodiversity (TEEB) reports and the decisions of the 10th and 11th Conferences of the Parties to the Convention on Biological Diversity held in Nagoya (2010) and Hyderabad (2012), an economic approach to the environment is currently seen as one of the most innovative solutions to Counteract Biodiversity loss. This idea reflects two major concerns. First, traditional conservation policies based on a three-pronged regulation-control-sanction approach have not succeeded in stemming biodiversity loss for the moment. Second, austerity coupled with the need for more efficient use of public funds has triggered a quest for alternative, more incentive-based financing solutions capable of raising additional sources of funding not previously tapped in biodiversity conservation campaigns (Laurans et al., 2011), however, their potential needs to be assessed in terms of their operational capacity to meet well-defined objectives.

**What is a PES?**

Although the exact definition of a PES still gives rise to debate and controversy, the most commonly-accepted one qualifies a PES as a "voluntary transaction where a well-defined environmental service (or a land-use likely to secure its provision) is being "bought" by at least one buyer from at least one environmental service provider, if and only if the environmental service provider secures service provision (Wunder, 2005). Take the example of a watershed: upstream landowners may receive payments from downstream water users (businesses, local authorities, consumers, etc.) in exchange for water treatment and pollution filtration performed by forest cover or wetlands. This would concern agreements negotiated between several stakeholders to pay suppliers for a service previously provided free of charge. This definition stresses both the voluntary and contingent nature of such arrangements although in practice, voluntary PES, contractualised between agents on a bilateral basis, cover only part of the social cost of their deterioration, i.e., all of the costs of the deterioration in these services borne by society, are not factored into the calculation of the private costs borne by economic actors. Thence the need to put a value on such services, factor them into the decision making process and ensure their funding and preservation. Payments for Ecosystem Services (PES) would appear in principle to do just this by turning the preservation of the environment into an income-generating activity that encourages economic agents to change their behaviour. PES also appear capable of raising additional sources of funding not previously tapped in biodiversity conservation campaigns (Laurans et al., 2011), however, their potential needs to be assessed in terms of their operational capacity to meet well-defined objectives.
of the spectrum of existing PES. Generally speaking, PES may be classified according to two main criteria: (i) whether payment is voluntary or regulatory; and (ii) whether an intermediary (public or private body or institutional structure) is involved in liaising between payer-beneficiaries and suppliers. Most currently-existing PES involve remuneration of watershed protection services, carbon sequestration and storage, habitat preservation for biodiversity conservation or landscape beauty. In addition, many of these ecosystem services are produced jointly and may simultaneously range from the local up to the global scale. In such circumstances, ecosystem services and their payments can be “bundled”. At the present time, it is difficult to get an overview of PES in operation throughout the world due to the absence of a common definition and the huge variability in local project features. However certain – non-exhaustive – data can provide us with pointers. Watershed services (replenishing aquifers, helping to prevent soil erosion, purifying water by filtering out pollutants) are among the best documented PES.

The parties involved: supply and demand for PES

On the supply side, the providers of ecosystem services are generally actors who are in a position not to actually produce the service but to enhance or maintain the capacity of an ecosystem to continue to supply the service, e.g., farmers or landowners. The term “PES” is therefore misleading as it does not indicate that the object of the transaction is rarely the service itself. For pragmatic reasons, suppliers are generally compensated for the opportunity costs related to changes in land use likely to favour the production of the service in question. In a nutshell, a PES seeks to make collectively beneficial land use practices profitable on an individual basis.

Key figures for Watershed Payments for Ecosystem Services throughout the world in 2011¹

- Number of active programmes: 205
- Number of programmes in development: 76
- Total annual value of transactions: $8.2 billion
- Number of hectares managed for watershed services: 117 millions

Source: Ecosystem Marketplace

¹ 116 million hectares out of 117 are included for China where more than 60 watershed PES programmes were in progress in 2011, for a total annual transaction value of €7.5 billion. A significant portion of these programmes are carried out under the national watershed eco-compensation programme, which (1) consolidates the watershed management policies between different jurisdictional boundaries – taking the form of financial transfers in some cases – and (2) targets and compensates upstream service providers for better management in the watersheds that are important sources of drinking water.
FOCUS
Examples of PES

A number of examples illustrate the potential of watershed PES as well as the complex issues involved in making them work on the ground. For a number of years, the cities of New York (USA) and Munich (Germany) have been working with farmers located upstream to facilitate transition to a more sustainable type of agriculture in order to preserve the quality of drinking water. In France, Nestlé (owners of the Vittel brand) and Evian (owners of the eponymous mineral water) have also set up similar programmes to preserve the quality of resources on which their business depends directly. However, the programmes actually implemented on the ground often correspond only partially to a PES. They may include broader land management policies for areas deemed to be of critical importance or policies to provide technical assistance or improve existing infrastructures. Moreover, decision-making may be dictated by both economic (preventative versus curative costs) and regulatory imperatives.

On the demand side, service users may be either direct beneficiaries or a third-party (public or private) buyer, acting as intermediary between the payers and service suppliers. Third-party intermediation is often required when the ecosystem service involves benefits not easily appropriated by users (Engel, 2008), or when there are many users and coordination between them is costly. This latter remark reveals the difference between reality and the perception we have of this instrument as based on negotiation between stakeholders without any public intervention: at the present time, the bulk of PES arrangements are funded and administrated by the public purse. This is especially the case for watershed services such as water supply where demand comes essentially from the public sector. It is indeed very rare to find businesses behind this type of PES projects either for enhancing their reputation or for securing their supply chain. Moreover, private sector initiatives are frequently motivated by current regulatory compliance issues.

Examples of PES

A number of examples illustrate the potential of watershed PES as well as the complex issues involved in making them work on the ground. For a number of years, the cities of New York (USA) and Munich (Germany) have been working with farmers located upstream to facilitate transition to a more sustainable type of agriculture in order to preserve the quality of drinking water. In France, Nestlé (owners of the Vittel brand) and Evian (owners of the eponymous mineral water) have also set up similar programmes to preserve the quality of resources on which their business depends directly. However, the programmes actually implemented on the ground often correspond only partially to a PES. They may include broader land management policies for areas deemed to be of critical importance or policies to provide technical assistance or improve existing infrastructures. Moreover, decision-making may be dictated by both economic (preventative versus curative costs) and regulatory imperatives.

The two key issues here are transforming a theoretical willingness to pay into an actual payment and raising private funds to finance PES.

Implementing PES and evaluation criteria

Implementing PES on an operational basis raises three key issues: environmental effectiveness, economic efficiency and equity.
which raises the issue of the pertinence of the geographical scale used to deploy the programme.

**Economic efficiency**

The economic efficiency of PES is intrinsically bound up with the additionality of ecosystem service supplies compared to the status quo (i.e., a situation where there is no payment). When there is payment, it is tantamount to paying actors to perform activities that they would have carried out anyway either voluntarily or involuntarily. In practice, evaluating additionality and the contingent basis of payment is equivalent to setting up a relatively costly system for monitoring in relation to a baseline and sanctioning failure to fulfil contractual obligations (ibid).

Another source of inefficiency consists of paying sums that are insufficient to cover the opportunity costs of changing practices (Engel, 2008).

**Equity**

The principal of PES is that they pay those who were not willing to change their practices for having actually changed them, whereas agents who spontaneously change their behaviour at the same time are not compensated. Uniform payments risk not reflecting the loss of subjective utility of each party. They also may have the paradoxical effect of directly conflicting with the purposes of regulation or even encouraging agents to be remunerated in return for compliance (Karsenty et al., 2009). Lastly, the underlying principle of PES may go against the approach developed by E. Ostrom and others which aims to highlight regulation and institutional governance processes for the collective management of natural resources.

In conclusion

PES are innovative arrangements which demonstrate that preserving the environment can be an economically worthwhile option for all stakeholders concerned. This makes them an especially promising mechanism. Their ability to provide solutions to environmental challenges depends greatly on how they are implemented.

Consequently, three recommendations may be made:

- Any PES project must consider the fit between the three key dimensions of environmental effectiveness, economic efficiency and equity. One possible way forward is to switch from an approach based on offsetting opportunity costs – that frequently goes hand in hand with abandoning usage rights – to an investment-based approach that serves to finance changes in technical structural arrangements (Karsenty et al., 2009).

- Inability to take into account the complexities inherent to ecological dynamics can militate against effective management of ecosystem functions. Therefore, it is important to envisage PES initiatives as part of an ecosystem approach based on integrated links between several different services (e.g., biodiversity co-benefits derived from carbon sequestration).
Legal issues involved in implementing PES in France

By Bernard Labat, jurist in environmental law and programme officer on “Economics and Biodiversity” to the Humanité et Biodiversité association.

Aside from economic considerations, the lack of an adequate legal framework is a considerable obstacle to the development of PES in France. One potential solution which is increasingly being talked about consists of reworking the question of easements from an environmental angle. The notion of easement relates to material encumbrances on property that restrict the owner’s rights to the benefit of other owners or third parties. However, the coercive connotation of the term in French (i.e., servitude) does not reflect the idea that easements may be voluntarily provided for by the parties concerned in a mutually beneficial manner.

At present, the debate is structured around three ideas:

- Greater flexibility in standard contractual easements provided for under Article 637 of the French Civil Code which do not preclude the principle of remuneration but which currently require the establishment of a legal relationship between two substantive issues: “servient” encumbered land and dominant land that benefits from the easement. In concrete terms, if we wish to use an easement to impose an environmental obligation on a landowner, two distinct land assets need to be brought together and this greatly reduces the scope of action from an environmental perspective.

- A legal arrangement that combines easements or rights in rem in pursuit of a general environmental interest which is tantamount to introducing public interest environmental easements. However, public interest easements have the disadvantage of not giving any entitlement to indemnification for those bound by them except in very specific circumstances.

- Using or reorganising the arsenal of other legal instruments that may be envisaged or effectively employed for contractual purposes: rural, environmental or quarry leases, administrative long leases, fiduciary instruments or arrangements that allow owners, managers or farmers to band together for contractual purposes. These instruments form part of a complex legal environment with development potential.

In the short term, legislative or regulatory developments would only appear to be likely for the first possibility, i.e., making private contractual easements more flexible. At the same time, we need to overcome resistance and even aversion to easement-type arrangements and work on making them more socially acceptable.

Bibliography:
The Mission Économie de la Biodiversité is attempting to come up with tools that reconcile economic development and preservation of biodiversity, and to devise and experiment with innovative biodiversity-centric projects. From setting up a new forestry programme that preserves both biodiversity and profitability, to coming up with new solutions for financing green and blue corridors, the MEB is using all of its resources to develop the tools of tomorrow.

How can we safeguard biodiversity, timber production and carbon storage while maintaining profitability for the forest owner? The Mission Économie de la Biodiversité has been looking at the case of the false ringlet butterfly as it explores new ideas for the production of maritime pines among the forests of the Landes region in south-east France.
The false ringlet butterfly (Coenonympha oedippus) lives in open, prairie-type habitats, wetlands and peat bogs covered with purple moor grass or black bog-rush. In the South-West of France it manages to survive in substitution habitats of grassy moor left from cutaway forest or in old pinewood copse.

The Landes forests of Gascony provide the last remaining bastion of the European populations of these butterflies, classified as endangered and strictly protected (Annexes II and IV of the EU Habitats Directive). The maritime pines forests were severely battered by Cyclone Klaus in 2009, leaving many areas of very open and humid treeland that could host large populations of false ringlets.

However, forestry management practices here are not conducive to the butterfly as they consist of eliminating all vegetation that competes with the pine trees and maintaining a dense tree population until harvesting, thirty-five years later. CDC Biodiversité and Société Forestière (subsidiary of Caisse des Dépôts) have been working together to identify new practices that could help to preserve habitats that are more conducive to false ringlets. The aim of the project, which involves naturalists, ecologists, foresters and economists, is to seek out multi-functional practices capable of reconciling timber production with protection of biodiversity and verifiable carbon sequestration, and guaranteeing profits for forest owners in the region.

New profitable forestry management practices that preserve biodiversity

All management actions and decisions were analysed to determine their impact on the presence of moor grass – the host plant that is indispensable to the false ringlet – as well as the humidity and openness of land plots, resulting in a proposal that was quite different from existing standard practices. The main changes related to the method of plantation (no tilling or use of herbicides to eliminate competing vegetation so as to limit interference with host plants), tree-thinning practices (more intensive thinning to limit tree density as soon as possible and optimise the amount of light getting down to the ground) and increasing the tree rotation period from 35 to 70 years in order to increase biomass storage and stave off the return of ground vegetation conditions that are less favourable to the butterfly.

The impact of drainage ditches was also assessed to restore wetlands that are more conducive to the host plant as quickly as possible. Based on a financial analysis, this new system is largely profitable, albeit less than the standard current practice dedicated purely to timber production, but this is where carbon sequestration comes into the equation, i.e., as a means of making up the shortfall.
A positive impact on greenhouse gas emission thanks to carbon storage

The new forestry practices could have a positive impact on greenhouse gas emissions by (i) boosting the amount of carbon stored by the forest by harvesting later, resulting in bigger trees; and (ii) by cutting down on emissions from tilling and fertilisation. The first assessment of the increase in carbon stock was carried out by Société Forestière which calculated a 50% increase in the “medium and long-term carbon stock” based on Verified Carbon Standards (the first global voluntary certification label for forest and carbon projects). Once the additionality of the new practices has been substantiated – using a recognised carbon label such as VCS, for example – this may give entitlement to carbon credits, thus generating additional revenues.

Additional income generated by the preservation of biodiversity

The preservation of the false ringlet butterfly is currently being considered as part of offset arrangements where the forest owner would be remunerated in return for switching to practices that are more conducive to the butterfly and the preservation of its habitat. Remuneration at the present time is variable but the amounts in question would appear to indicate that profits from “Wood, Carbon, Biodiversity” programmes are equal to or greater than (depending on the price of CO₂) profits from standard “Wood” management practices.

New perspectives for sustainable forestry management

This demonstration proves that in the case in point it is possible to reconcile forestry profitability with preservation of biodiversity. Subsequent developments in the programme and their implementation will enable the initial findings to be validated.

This work will involve expanding the scope of the method and the findings. One inherent stumbling block relates to the territorial character of biodiversity: the challenges and appropriate management practices are totally dependent on the site itself and the species in situ.

Therefore the key point in all this consists primarily in one principle and one method: defining the needs of the species concerned and deducing what is conducive/unconducive to its presence, then using technical choices or planning changes to maximise these favourable periods, and targeting approaches that optimise overall profitability.

Differential carbon stock between the two scenarios over time (in tonnes of CO₂/ha)
(without including risk factors or any leaks or other sources of risk)

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Biodiversity, the new future for cities?

It is now an established fact that biodiversity is present in cities but this urban biodiversity needs to be more than just a nice little novelty. Functioning urban ecosystems are necessary for effective preservation of overall biodiversity and they represent great opportunities for modern cities that use ecosystem services on a sustainable basis as part of their modus operandi. In particular,

- reducing urban heat islands,
- harvesting rainwater and the impacts on its quality are crucial issues in cities to which ecosystem services can provide solutions.

The Mission Économie de la Biodiversité is funding two theses in functional ecology at the BIOEMCO research unit – part of Ecole Normale Supérieure de Paris. The two researchers are focusing on the characteristics of functional ecosystem roofs and how trees use water in cities, and their research will form part of a broader reflection process. The aim is to come up with techniques for using plants in cities and model roofs that maximise ecosystem services and are economically viable for contractors.

Inventing new financing solutions for re-establishing ecological networks?

Establishing green and blue corridors is a key, innovative plank of the Grenelle environmental conference and this ecological infrastructure needs to become embedded in planning processes, especially through local and regional ecological coherency blueprints (SRCE in French) and how these are included in planning documentation.

- SRCEs are currently being drawn up at regional level and the question of funding their implementation remains a hot topic. For those few regions that have actually estimated the costs involved, there is little doubt that, as expected, currently available public funding falls a long way short of what is necessary.
- So what additional sources of funding can be raised? The Mission Économie de la Biodiversité is currently working on this very question. The first phase of its analysis will focus on the types of financing used up to the present for re-establishing ecological networks and then go on to propose possible additional methods. The findings will then be used to set up pilot schemes at local and regional level.
INTERNATIONAL
A FIRST STEP TOWARDS ENVIRONMENTAL ACCOUNTING?

The Environmental Profit & Loss Account (EP&L) developed by Puma – the sporting goods manufacturer owned by the Pinault, Printemps, Redoute group – calculates the environmental impact of the firm’s business at all levels of the production chain from an economic perspective (see table): from distributors to extractors of raw materials and farmers, both for the production of cotton and cattle (source of leather). The key contribution of this exercise is the especially wide-ranging scope of the evaluation of pre-production impacts: this type of analysis usually stops at first-tier suppliers – or second-tier suppliers for the really diligent! The project is part of the group’s stated aim of accounting for and using the value of services they derive from nature to optimise their risk management processes. Can this approach be termed environmental accounting? What are its main benefits and limits?

Methodology
An EP&L reflects the following environmental issues: water scarcity (water consumption), biodiversity loss and ecosystem services (land conversion), participation in climate change (greenhouse gas emissions) or smog(1) and acid rain (other atmospheric pollutants). Puma has decided to estimate the financial impact of its environmental footprint.

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(1) Mix of smoke and fog that sometimes lingers over urban and industrial centres.
It should be noted that Puma itself does not generate much pollutant emissions or ecosystem impacts directly and it outsources a large part of the production chain, including parts of its production activity. The company’s business is limited to distribution. Therefore, suppliers and their practices are central to any environmental degradation and although Puma is not directly liable, the company and its suppliers are totally dependent on each other.

**Economic analysis**

This exercise is part of a quest for more efficient input management (innovating by cutting production costs). Such work is not new in itself and the economist Porter has demonstrated how better input management can generate a “double dividend” of economic efficiency and ecological decision-making. Reducing water consumption, CO₂ emissions and land-use are part of just such an approach:

- **enhanced ecological efficiency due to a reduced environmental impact on the back of a reduction in input consumption;**
- **enhanced economic efficiency driven by the dual impact of a reduction in consumption (lower input costs at constant prices) and anticipation of increases in the price of these resources on the market, which should give an even greater boost to the firms competitiveness in the medium term.**

However, there is a mismatch between the values assigned to water and carbon and actual values, especially the cost of the measures Puma should take to fully offset the deterioration in natural capital for which the company is responsible. The figures that appear in the report are actually average values for carbon and water². The value assigned for water both as input and output (including waste water) is simply a function of the scarcity of the resource and not its quality. To underline this point about the disconnection between values used and actual values, Jacques Richard (2012) noted: “Given the disagreements between specialists, the report’s authors had to take average costs for carbon and water from a number of different studies”.

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² Given that the average value for ‘l’ of water ranges from a few cents to €5, depending on the scarcity of the resource.
Conclusions

Puma set out to perform a proper exercise in calculating economic externalities and despite the inherent limits, it appears to have come up with a reasonably accurate result. Technical choices have been substantiated, assumptions are always provided and methodological limits pointed out in quite a transparent manner. Therefore, this would appear to be the most comprehensive exercise in calculating economic externalities performed by a private corporation to date across its entire production chain.

As part of the exercise, Puma is proposing to implement a code of good conduct and environmental, social, health and safety standards. The company also reports on individual responsibility and fair cost-sharing arrangements. Suppliers need to try to reduce their impacts without hitting shareholder interests in line with a dual dividend approach, and plans are also afoot to participate in philanthropic or job-creation initiatives for offsetting purposes.

However, we should note that there is a big difference between the text that actually deals with the impacts of the ecosystem services and the reality of the study: there are definitely differences in substance between stated aims and the reality of the work carried out.

Proposals for the future

In the wake of this evaluation of negative externalities, Puma intends to prepare an evaluation of the company’s positive social externalities in terms of job creation, tax payment, corporate philanthropy, etc. The idea is to add up positive and negative externalities to estimate overall social costs generated by a company based on the assumption that substitution between different types of capital is possible (financial, environmental and social capital) and corresponding to a weak conception of sustainability. A certain amount of deterioration of natural capital and drawdown of resources is possible if the corresponding losses are offset by financial gains.

Michel Trommetter

is an economist and researcher at the French agronomics institute (INRA). He is a member of several scientific committees including that of the Paris Natural History Museum (Muséum National d’Histoire Naturelle de Paris). His research focuses principally on analysing intellectual property rights in biotechnologies, innovation and biodiversity from an economic perspective.
Caisse des Dépôts: first French signatory of the Natural Capital Declaration

At the Rio+20 UN Conference on Sustainable Development held on 18 June 2012, financial actors were offered the chance to sign the “Natural Capital Declaration” as part of United Nations Environment Programme Finance Initiative.

Natural capital is the stock of natural ecosystems that yields a flow of valuable ecosystem goods or services into the future. It concerns the supply of food or certain building materials as well as regulatory services such as climate or water and air quality regulation, pollinisation and cultural services.

The declaration aims to recognise and reaffirm the importance, for financial businesses (lenders, investors, insurers), of natural capital in preserving a global sustainable economy. Financial institutions leave a considerable ecological footprint through their clients but, aside from a responsible approach, the declaration aims for a better assessment of the ecological risk, particularly for the key agri-business and tourism sectors, for example.

41 banks, investment funds and insurance groups, supported by about 20 NGOs (such as the WWF and the Global Reporting Initiative) have undertaken to:

- understand the interactions between their operations and natural capital (impacts and dependencies);
- integrate Natural Capital considerations into the decision-making process of all financial products and services;
- report/communicate: collaborate to build a global consensus around the development of Integrated Reporting which includes Natural Capital as part of the wider definition of resources and relationships key to an organization’s success;
- work towards building a global consensus for the integration of Natural Capital into private sector accounting and decision-making.

Phase 2 has just been launched in order to coordinate the implementation of the related research work over the 2013-2015 period.

Caisse des Dépôts has been a participant in the UN Global Compact since 2004. It was among the very first signatories of the UN’s Principles for Responsible Investment in 2006 – and the first French signatory – and it constantly works to promote responsible investment principles among French investors.
A number of research projects dealing with PES are in progress in France and throughout Europe. The SERENA project (http://www.serena-anr.org/) focuses on issues related to the emerging notion of “environmental service” in public policies in rural areas. The PESMIX project (http://pesmix.cirad.fr/) aims to evaluate the contribution of these instruments to environmental and agricultural policies and analyse synergies/conflicts with other instruments used in public and private initiatives by comparing situations in Mexico and Madagascar.

The INVALUABLE European project, (http://invaluable.fr/), coordinated by IDDRI (France), researches the use of market-based instruments (MBIs) and the economic valuation of ecosystem services. We should also mention the BIODISCEE cross-disciplinary thematic network of the French Institute for Ecology and the Environment (INEE) and the French Society for Environmental Law which is developing research programmes around PES. A joint conference to deal with these projects and networks is planned for May or June 2014 in Montpellier and could constitute an important step on the road to a PES cross-disciplinary research network / forum.

**Presemtation of the International Conservation Finance Alliance Network (CFA)**

CFA is a global network set up in 2002 to tackle the challenges posed by sustainable financing and biodiversity conservation. It includes a broad range of over 200 actors drawn from both the private sector (companies, banks, NGOs, foundations and universities) and the public sector (ministries, international organisations). The network helps pool experiences and facilitate cooperation between partner organisations and it develops tools designed to optimise conservation financing capabilities (e.g., Environmental Funds Toolkit). Most of its activities are carried out by working groups tasked with producing publications, organising workshops and getting pilot projects off the ground. The three core themes tackled by the working groups are protected areas financing, innovative biodiversity financing mechanisms and environmental funds.

**Initiatives Towards a French Network on Payments for Environmental Services?**

by Alain Karsenty, socio-economist at CIRAD.

Alain Karsenty, has a PhD in social science and is a researcher at CIRAD. He analyses public policies concerning forests, land use and the environment in developing countries, especially in Central Africa. His key research focuses include forestry taxation and anti-deforestation economic policies and instruments.

For more information, go to www.conservationfinance.org