



NATURAL  
CAPITAL  
COALITION

ENABLING BUSINESS  
DECISIONS THAT INTEGRATE  
NATURAL CAPITAL

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LEARNING FROM  
A COMPLEX  
SYSTEMS  
PERSPECTIVE

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ICAEW



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## 01 Introduction

The central focus of this paper is enabling better business decisions by taking natural capital into account. In exploring this we give specific attention to elements that promote up scaling the Natural Capital Protocol (the Protocol), an important tool for improving business decision-making that the Natural Capital Coalition (the Coalition) is currently developing and pilot testing.

Fishing regulations usually specify minimum catch size limitations to protect smaller fish. It seems intuitive that protecting the young fish helps to sustain fisheries. But according to George Sugihara<sup>1</sup> that intuition is wrong. “It’s not the young ones that should be thrown back but the larger, older fish that should be spared,” he explains. They stabilize the population and provide “more and better quality offspring.” Such seemingly commonsense policies, can lead to boom and bust cycles. Fishing populations are systems that should be analyzed using complexity tools as Sugihara has done, and not assuming they are equilibrium systems, behaving linearly: understanding fisheries requires grasping their systemic nature.

Responsible use of natural resources is often subject to such systemic dynamics. Policies and metrics that aim to improve the health of our natural environment and the way we exploit natural resources need to take into account these effects. In this paper, we explore how to create an enabling environment for natural capital to be integrated into business decisions. In order to do so, we aim to further broaden our perspective. Therefore we look at the issue through a systems lens, in order to discover whether this yields new ideas for action.

The enabling environment should not only support current front-runners that are already interested in the Protocol, but help create broader interest in the business community, with the aim to mainstream natural capital thinking in all businesses, from SMEs to corporates. We also want to look beyond today’s companies: the average life expectancy of firms is less than 15 years and around 40 for the only largest companies. How can new companies be influenced to include natural capital considerations early on? Should one expect a changed approach in care for nature to come from the existing system, or focus attention on the renewal of the economic system with different features? Are there other systemic effects; such as is the case with the fisheries? It is the old adage of working within the system – or working to create a new system.

Our ambition here is merely to stimulate the discussion, rather than to provide definitive answers. First we set the ‘natural capital scene’, by shortly describing the emerging movement of better business decision-making by taking natural capital into account. Then, we explore lessons that can be derived from a systems lens, building on our growing understanding of the dynamics of complex systems. Subsequently we present possible elements of an enabling environment to better integrate natural capital in business decisions through the Protocol. Then we reflect on systemic effects that may require new policy approaches. We conclude with next steps and an invitation to join the discussion.

## 02 An emerging revolution: taking natural capital into account

Over the last decade we have seen that business is slowly taking natural capital into account following increasing recognition through international and government led initiatives of how natural capital underpins our economy and its importance to our wellbeing. An important step has been the international collaborative program ‘The Economics of Ecosystems and Biodiversity’ (TEEB) that aimed to develop a global study on the economics of ecosystems and biodiversity loss and to guide practical policy responses. This program resulted in several reports, including one in 2010 which was dedicated to business.

A breakthrough within the business community was the publication by Kering’s Puma unit of its 2010 Environmental Profit – and Loss Account.<sup>2</sup> For the first time a company reported on its impact by using monetization to compare different environmental impacts and relating them to the financial performance. Also governments and financial institutions explored ways to incorporate natural capital into their systems, such as the UN’s System of Environmental-Economic Accounting (SEEA), and the Natural Capital Declaration (NCD) in the financial sector. Since then, several businesses have followed in Kering’s footsteps. However, the lack of a shared framework for businesses that want to integrate natural capital is hampering a broader uptake. In order to fill this gap the Coalition was established, to build on previous efforts.

### Going beyond the ‘business case’

What is the business case for including nature in decision-making? Business cases are framed as a pre-requisite for business decisions, but is that their real role?

In fact a survey<sup>3</sup> of over 80 Coalition business partners has found that many factors may influence the adoption of the Protocol. The framework should be accessible and flexible, as well as convey credibility and relevance. In addition it should deliver meaningful results, which improve the quality of decision-making and also unlock value. This is consistent with a view of business as a complex system, where profit can be framed as a fitness criterium, rather than a goal.

A way to circumvent this might be through promoting a ‘Protocol adoption challenge’ among top business schools. Teams of students would compete to develop the business case for including nature in decision-making and focus on implementing the adoption of the Protocol in particular economic sectors or companies. Successful in other areas, this would constitute a push for innovation coming from the younger generation, a type of bottom-up strategy where winning teams have the opportunity to present the idea to top managers and CEOs and actually see their ideas being developed.

## 02 An emerging revolution: taking natural capital into account

Continued

Currently, the Coalition is well advanced in developing the Protocol. The goal of the Protocol project is to create a framework, a tool to enable businesses to understand and incorporate nature into their decisions, to include risk management, to explore new revenue streams, to improve products and to value chain innovation. One of the motivations behind the Coalition was to bring together many of the initiatives that were happening across many forums, consolidating what was going on in many places. While there is widespread interest amongst leading companies, the implementation of the Protocol is still very much at a trial stage.

The draft Protocol aims to change the practice of existing companies. Yet in industrial transitions, some existing companies will not survive and new players will emerge. Most recently, the IT transition saw the disappearance of many familiar names (DEC, Compaq, Bull...) and the emergence of GAFA (Google, Apple, Facebook, Amazon). The plummeting market capitalization of the German utilities may portend a similar development in the energy transition. Acknowledging this is an awkward strategy for engaging the existing players. Yet a reflection on how dependent the envisioned change is on the current actors may well be important. Can the Protocol contribute to sufficient systemic change or does it mainly drive incremental change within existing structures? What additional policies may be required?

There are obvious parallels between the Protocol and management accounting. Disclosure through reporting can be an important driver as well, but it needs to be introduced at the right time. An early push for disclosure is tempting, but it does not always drive change and can occasionally stimulate risk adverse behavior, rather than push for innovation. Articulating the theory of change behind the Protocol can help push for the right kind of implementation. The dichotomy between 'principle-based' and 'rule-based' tools also reflects this dynamic. The terms themselves are the visible tip of a set of assumptions on the functioning of the underlying systems.

### The role of business data on natural capital

What is data for, in the context of managing Natural Capital? Amongst the various phases of transition, data is particularly important in the initial phase of the broader transition to include nature in decision-making. Just like in traditional accounting, having data on the state of a business is a required reflection of the state of affairs. The numbers provide a description of where things stand, so that the debate on appropriate action can start. This is subtly different from describing data such as profit as the goal, but considers it as the foundation for action. Data does not need to be public for this purpose, and as a result the requirement to disclose can come later in the transition. However, the faster businesses and other stakeholders can start to jointly develop and share data sources, the less scope there is for wasteful duplication of effort. Thus efforts to develop joint data collection and sharing initiatives are likely to be important over time.

Publicly shared data is important for accountability and verification by various stakeholders, but it is also a pre-requisite for collective action. Data/analysis which clearly demonstrates the extent and nature of a problem, the trends over time, and the associated impacts, provides the necessary basis for raising awareness about the existence of the problem. It highlights who stands to lose from it, and who is responsible for it. This in turn therefore motivates a response by relevant players (i.e. business, government, other stakeholders). Having shared data that is also relevant for various stakeholders forms the foundation for overcoming the collective problems, which characterize many natural resource issues – such as the 'tragedy of the commons'.

## 03 A systems perspective

Deeply interconnected systems behave in ways that surprise. Whether it is the economy, large organizations, energy policy or ecosystems, the interconnected nature of systems leads to emergent behavior not obviously triggered by a single cause. These complex systems can trip across thresholds into sudden transitions and can react disproportionately to seemingly small triggers, or even change out of themselves, endogenously. They have collective or emergent properties that cannot be traced back linearly to the underlying components.

### A glossary of terms

**A Complex System** is composed of a large number of parts that interact with each other. The interaction between the parts leads to the emergent collective behavior, which in turn influences the parts.

**Transition management** is an approach for tackling the complex issue of sustainable development. Transitions in complex systems can be non-linear, discontinuous and characterized by various phases.

**Natural Capital** is the stock of renewable and non-renewable natural resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.

**The Natural Capital Protocol** is a standardized framework for business to measure and value its direct and indirect impacts and dependencies on natural capital.

Uncertainty looms large in the modern world. Some small events appear to have large consequences, disproportionate to their importance. For example, in 2008 a crisis in the public finances in a relatively small economy such as Greece drew in the entire Euro zone; financial misbehavior by some banks tripped up the entire financial system. In public policy and in management, uncertainty is an unwelcome guest – and great efforts are expended to reduce and eradicate it through modeling, predictions and risk assessment. Yet complexity science suggests that many of those efforts will be fruitless as they overlook key features of these financial, socio-economic and political systems.

Complexity science is analyzing all kinds of systems and starting to yield a better understanding of them. Since 1986, the Santa Fe Institute has catalyzed a new science of complex systems, providing new insights and models across most scientific disciplines.<sup>3</sup> Stephen Hawking has said that he expects that ‘the next [21st] century will be the century of complexity.’ Going back to the root of the word, complexity can be traced to plexus in Latin, which means to braid. In effect, complexity is the science of braided, or interconnected systems. Highly interconnected (or complex systems) are characterized by inherent uncertainties, but also knowable patterns. Whether in policy, strategy or operations, the challenge is to harness complexity and make it work in practice, towards more effective policy and management.

More broadly, complexity science underscores how some uncertainties are irreducible and must be accepted, rather than simply wished away. There is no amount of data that will allow for the behavior of those systems to become entirely predictable. However the very fact that there is irreducible uncertainty is itself knowable. The generic insights from complexity science about the nature and characteristics of complex systems provide a complexity frame, distinct from the more technical results of the science.<sup>4</sup>

It is worth noting that not all systems are complex. Lord Browne, when he was CEO of BP, was once asked whether he thought the oil industry business model was complex and, after a moment of reflection, he answered no. Indeed most oil exploration projects are largely independent of each other, so that the whole is more or less the sum of its parts. Many industrial processes have been structured to be non-complex and therefore easier to manage and control. The behavior of a natural system, in contrast, is characterized by its interconnections and is therefore inherently complex.

Our education system and scientific tradition both guide us to strive to reduce these complex systems to their component parts and analyze their drivers in isolation. While this makes their analysis more tractable, it also puts us in danger of discarding the essence of their dynamics, as it overlooks the role of the interconnections between the parts. Fortunately we increasingly have tools to deal with complexity, rather than assuming it away.

Looking at issues through a complexity lens can lead to new policy options that may not have been considered before. Public policy debates are often locked into a dichotomy of free market versus state control frames. A complexity frame shows how top-down and bottom-up effects interact and how purposeful bottom-up policies can be designed and enacted. It thus provides another, complementary perspective on public policy questions, and can lead to different solutions and approaches that may not be intelligible without it. Complexity does not constitute a new paradigm; it is merely an expansion of the existing scientific approach. As such, a more limited reductionist approach can still be appropriate, albeit applied consciously and with awareness of its assumptions.

At the same time we need to be wary of over-reach. Sweeping claims have been made as to what the new science would deliver, both in the ambitions of complexity scientists, as well as in the accompanying media interpretations. Solid results have been delivered in a range of areas, from traffic management to the design of catalysts. However, we are unlikely to model the transition of entire economies or multinational companies any time soon – if ever. For policy and management, framing issues as complex provides an expansion of options; however, counting on complexity science to deliver new certainties is, for many topics of practical concern, at best premature.

### Elements of complexity frame solutions

Simple recipes will not easily divulge systemic solutions. There is no crisp list of terms conveniently starting with the same letter that can guide us. However, the collective experience of practitioners looking at a problem through a systems lens can lead the way to innovative solutions. Indeed, the very purpose of this document is to invite such a community of practice for a systems reflection on Natural Capital. Below are some suggestions for characteristic elements of complex systems that can help guide our reflections:

#### Ever-changing

Inside complex systems there are also non-linear relationships, often with multiple feedback loops. There is no balance in the classical, static sense, but there are multiple evolving equilibria. A complex system is continuously subject to fluctuations, but a system sometimes reverts back to an equilibrium state (the “attractor”). This appears like a ‘lock-in’, as state that the system cannot get out of without help. But we can also refer to the system as being resilient. That is not always a good thing: an organization like the Mafia is extremely resilient and for the energy system there appears to be a ‘lock-in’ to the system of fossil fuels. Under specific disturbances the system can also turn to a different equilibrium. This finally appears as a tipping point. However, the interesting phase is the build-up to the tipping point, where cascading effects occur inside the system. These cascading effects are not always reversible as thresholds can be crossed, or only with great effort (hysteresis).

#### Emergence

In a complex system the dynamic interaction between actors at micro level leads to structures and self-organization at macro level. It arises as macro-structures appear to surface ‘automatically’, but in fact there is an aggregation effect. Such an effect is more than the sum of its parts: the flight of a single bird cannot predict what formations a cloud of starlings will take. We also know emergence from our highways: often traffic jams caused by small-scale deviant behavior of a few individual motorists, with a long chain of effects on those behind them, lead to traffic jams even when there is no excess traffic. In relation to natural capital, an example of this might occur where behavior by individual firms results in culture change which has a disproportionate impact on overall business behavior.

#### The central role of actor diversity

A complex system is not a homogeneous population of rational actors, but its very diversity and differences define its behavior. Actors (individuals and institutions) have different motivations for their actions, although they may be driven by routines and habits. For a classical economist this is called a non-rational actor, but researchers like Kahneman have provided a much richer characterization of individual behavior.<sup>5</sup> Crucially non-rational does not mean irrational – and human behavior follows knowable patterns. Collectively their behavior can go well beyond traditional patterns such as the ‘tragedy of the commons’, where actors are assumed to have incentives to take out more than they put in. Elinor Ostrom has documented how the tragedy of the commons is often the consequence of simplistic governance arrangements and that

communities can develop more polycentric, ambiguous forms of governance that overcome this. However, such messy governance systems are not intelligible in a traditional market or a government control frame; they require a complexity frame to make sense of. An example is the governance of the EU, which is sometimes the butt of derogatory media coverage for its lack of clarity. But it can be argued that this confusion is at least partly a feature of the frame of the observer, rather than of the observed structure. The EU’s governance can plausibly be described as a polycentric system, which better helps interpret how it is effective and predicts project likely outcomes, problems and successes.

#### Networks matter

Complex systems may be described in terms of relationships and interactions between various components of a network. Networks are not always homogeneous; social networks and the Internet are characterized by a structure with hubs: a small number of specific components with very many connections, and a large number of components with few connections. This is a particularly stable configuration, under most circumstances. Understanding the impact of different network topologies is essential. For example, the Central Banks traditionally focus on the stability of individual banks, assuming individual agents determine the stability of the system. Taking a systems lens, it becomes readily apparent that network stability and agent stability are very different problems.

### A tap on the shoulder

A group of connected individuals can change quickly, if something can be made contagious across the relations that link them. This is of course true of the spread of a disease, but it can be equally true for the spread of benign ideas. The connections are often not visible, so a challenge is to identify them. Can we find ways to leverage this connectivity to spread the implementation of the Protocol?

Here are four such suggestions:

- **Bring someone in:** When becoming a member of the Coalition, the company should commit to inviting another company/organization to join within a year – it can be a supplier, a competitor or a peer from a different sector. Note that bringing a supplier could help focus on supply-chain traceability, a key motivation for businesses engaging in natural capital management.
- **Create specific C-level agendas:** In order to attract attention and interest of CEOs and CFOs, specific agendas or programs could be developed using a language that is understandable and interesting at C-level.

## 03 A systems perspective

Continued

- **Create a partnership:** When working in the Coalition, organizations have the opportunity to create partnership projects with at least one other company, either the one that the company has invited or another one, in order to pool resources and work towards a common cause. The project can be on a specific geography or on a specific ecosystem/biome or on a specific part of operations.
- **Knock-on impacts associated with implementing the Protocol:** When a company implements the Protocol, it might assess its dependence on a particular natural asset, and future risks to the continued availability of that asset, looking at increasing demands on that asset from additional sources such as other businesses. If that information is shared publicly, it shifts the attention onto other companies who may not have previously been engaging on natural capital, and increases their awareness and the pressure on them to assess their own risks and ways to manage them.

### Evolution

The dynamics of a complex system often evolve step by step through an evolutionary mechanism like in natural systems, rather than following a planned route. These mutations lead to innovation and differentiation, which is then maintained or reduced through a mechanism of selection. The next step is 'retention' or building on existing success. In this perspective, the market is not so much the mechanism that connects supply and demand with an optimal price, but rather a selection mechanism, a test for success or failure of new innovations and ideas.<sup>6</sup> The strategy for the Protocol itself also follows such an approach: it is not set in stone and is intended to incorporate the lessons and insights that are discovered en route, in turn enriching the Protocol. A good way to stimulate such innovation by the private sector is through 'crowdsourcing of regulatory solutions' whereby government sets out a timetable over which it intends to develop a regulatory solution (i.e. makes the regulatory threat clear) and then gives business the space to come up with its own solutions in that timeframe. This allows for a period of innovation and experimentation in which the best ideas are scaled up while less successful approaches are dropped.

### Government's role in innovation

Government could play a substantial role in all transition phases to integrating natural capital into business practice. It is often assumed that innovation is primarily done by firms. However, in Mariana Mazzucato's book 'The Entrepreneurial State', it is shown that it is governments that need to be entrepreneurial in fundamental innovation, creating the conditions that will draw in business. For example, she cites the four key technologies underpinning the smart phone and relates how they were all developed with government funding. Government then created ecosystems of innovation amongst universities, business and small entrepreneurs as well as being the buyer and provider of tax breaks and subsidies that created the technologies.

This perspective on how innovation is enabled and deployed highlights how interconnections between public and private entities are essential for progress, extending to better use of natural capital.

### Discontinuous transitions

Change in complex systems is often not continuous, but comes in phases that are analogous to phase shifts as described in physics, when water turns into steam. What happens is that small pockets of the new state appear, dispersed throughout the system, often not visible to the casual observer. These pockets multiply and grow in size by connecting and merging. Suddenly, when some of the larger pockets recombine, they become visible at the scale of the system: they have reached a critical mass. This constitutes a tipping point for the system. In social systems, in a successive phase such change may become institutionalized.

**03** A systems perspective  
Continued

**Scaling up**

“It’s hard to sell a swamp to an engineer”, was a key message from a project team from Dow that looked at barriers to scaling up Green Infrastructure.<sup>9</sup> A Green Infrastructure project is never ‘finished’ in the same sense as a traditional infrastructure project, which can be handed off to routine maintenance, instead of involving continuous adaptation and evolution.

Green Infrastructure uses elements of natural systems, and is contrasted with traditional gray infrastructure that is blueprint-driven. Examples include creating oyster reefs for coastal protection, and reed beds that treat industrial wastewater, and restoring natural riparian habitat to enhance water provision.

Pilots in various companies such as PDO’s Constructed Wetlands for Produced Water Treatment in Oman or Union Carbide’s Wetlands for Wastewater Treatment in Seadrift Texas have shown that Green Infrastructure solutions often demonstrate financial advantages in the form of lower capital expenditures and lower operating costs. Yet time and time again, these advantages do not translate into widespread adoption and scaling up.

The barriers are cultural as reflected above, but also require skill diversity. Green Infrastructure inevitably requires a wider engagement with multiple stakeholders, a more comprehensive economic and environmental footprint analysis relative to traditional models and techniques, and adaptation to business processes.

The challenges to Green Infrastructure are emblematic for the barrier to scaling up the adoption of natural capital in the later phases of transition. Mere financial viability is not enough, nor is data that demonstrates success. A deeper transformation must be accommodated.

**The contagion of social norms**

In most macro-economic models it is assumed that social norms are given. In a complexity perspective we see how social norms co-evolve with policy, through constant interaction. Policy must take explicit account of this relationship. Take for example the discrepancy of public support for the Energy Transition in the UK and in Germany. The German emphasis on the adoption of solar panels on private homes has made the transition a matter of personal identity. Neighbors will inquire about the visible choices made, and challenge other inconsistent choices: “What about the Porsche in your garage, if you are so green?” The UK’s priority on offshore wind may well be sensible from an energy infrastructure perspective, but it can be expected to have much less effect on social norms, as green electrons replace brown electrons in anonymous power sockets. The contagion effect into other environmental issues also is less likely to occur. This difference in engaging individual social norms helps explain the much higher level of support in Germany. In a systems perspective, attention to the co-evolution of social norms becomes an explicit policy consideration.

**04** The enabling environment

When considering an enabling environment promoting business decisions that integrate natural capital, we can distinguish two processes. On the one hand there is the overall desired outcome, which is the systematic inclusion of nature in decision-making. On the other hand there is the upscaling of the use of the Protocol, that can play an important role in creating awareness and first moves throughout business, in order to bring the overall desired outcome within reach.

Applying a systems lens helps identify the potential elements of an enabling environment. Many of them are highlighted in boxes throughout the text:

Lessons learned	Elements of an enabling environment
<i>Feedback loops rule</i> , so identify and influence major feedback loops	<ul style="list-style-type: none"> <li>– Invest in data that can be used in implementing the Protocol</li> <li>– Develop benchmarks based on the Protocol to ignite a ‘race to the top’</li> <li>– Use the Protocol to embed natural capital in reporting frameworks and regulations</li> </ul>
<i>Networks are crucial</i> , so take an active networking role and connect to all stakeholders	<ul style="list-style-type: none"> <li>– Use dynamic networks to increase the uptake of the Protocol</li> <li>– Connect to other initiatives related to natural capital thinking and tools</li> </ul>
<i>Change requires time</i> , so identify major phases of change and adapt your strategy accordingly	<ul style="list-style-type: none"> <li>– Build tools to support change (especially to promote the use of the protocol by SMEs and first-followers)</li> </ul>
<i>Influence ‘right and wrong’</i> , so develop a narrative and embed this in norm-influencing agents	<ul style="list-style-type: none"> <li>– Build a narrative around natural capital (including business case discussion)</li> <li>– Embed natural capital in education</li> <li>– Internalize natural capital in prices</li> <li>– Enable For Benefit Corporations</li> <li>– Use the Protocol to embed natural capital into (public) procurement</li> </ul>

It will take time to achieve full inclusion of natural capital in business decision-making and it will take time for the Protocol to be used by the majority of the business community. However, in order to better gauge direction, we assess where the Protocol currently stands in terms of the transition steps.

## 04 The enabling environment Continued

### Connecting to other processes

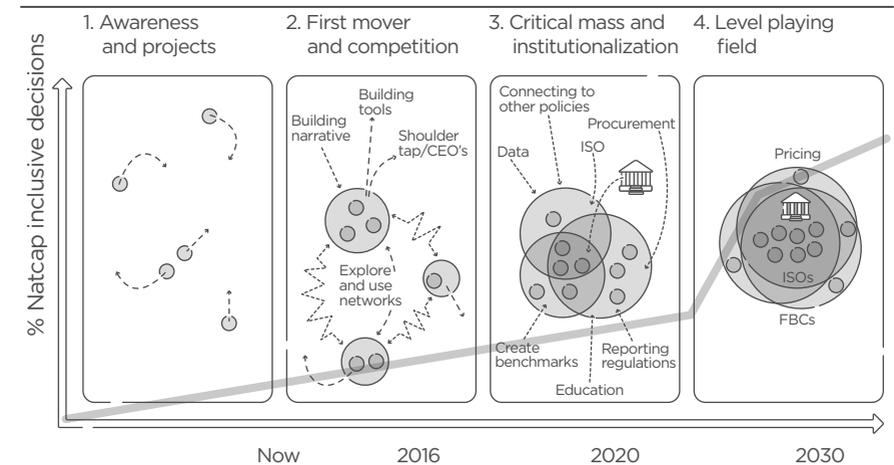
There are many conversations and initiatives that pursue agendas related to the Coalition's ambitions. Some connections have already been made, but in particular in the context of identifying and stimulating first movers, it may be worthy of a focused effort to build more links.

For example:

- **Sustainable agriculture:** RSPO, RTRS and Cocoa Coalition may offer opportunities to include Natural Capital language and considerations in projects such as pilots, within the Protocol process that are linked to these initiatives.
- **Sustainable mining:** How can the Protocol influence the legislation for mining? Can it connect to circular economy package EU and discussion on urban mining?
- **Infrastructure:** How can infrastructure plans and policies support sustainable use and management, including - if necessary - restoration of natural capital?
- **Cities:** Initiatives such as the C40 or the Rockefeller Foundations 100 Resilient Cities focus on urban transitions. Engaging with them may play cities a leadership role in scaling up thinking of valuing natural capital in business but also understand/build awareness beyond urban boundaries.

Four phases can usefully be distinguished. In the first phase (inception phase) there is no comprehensive approach; frontrunners are small and individually active. In the second phase (first mover phase) there is an emergence of more organized and visible initiatives. Frontrunners are growing and mainstream players start to experiment. It is the competition between initiatives that leads to innovation. In the third critical mass phase competition no longer is helpful enough. Stakeholders recognize that they need to work together to tackle obstacles that inhibit change. Standardization of tools and instruments take flight and government starts to institutionalize the agenda. In the fourth and final institutional phase change becomes mainstream. The building of the Protocol itself has approximately progressed to from phase 1 through 2: frontrunners start to pilot with the Protocol, and first steps with respect to institutionalization are explored (e.g. the decision of ISO to develop a natural capital standard). However, at the same time within the broader business community, awareness of the importance of natural capital decision-making still is in its infancy (phase 1). This means that it is not plausible that institutionalization of the Protocol will take place quickly. Too early an institutionalization may even be counterproductive and reduce the take-up of the Protocol.

Therefore, the introduction of possible policy actions to support the third and fourth phase, like benchmarking, voluntary reporting and mandatory standards (ISO etc...), need to be carefully planned and implemented, with the right timing. Building on these deliberations, the possible elements of an enabling environment introduced can be positioned tentatively in time:



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The suggested years are at best indicative, but give a sense of possible timing. However, it is important to acknowledge that these elements need time to be prepared and support to be implemented. Therefore, it always seems smart to prepare the grounds for later phases in the transition by investing in continuous innovation. This includes creating new partnerships for cooperation, as in the example of Netherlands' Green Deals.

## 04 The enabling environment Continued

### Investing in public-private coalitions

Public-private coalitions can play an important role in the systemic change that is necessary to achieve a sustainable use of natural capital. Government can promote the development of these public-private coalitions. Examples are the so-called 'Green Deals' that the Dutch government has developed to spur on sustainability. These Green Deals are agreements (covenants) between private and public partners, including NGOs, for joint actions to remove bottlenecks or to increase collaboration to achieve or implement sustainable solutions. Government can, for example, change laws and rules or find partners for cooperation. This way, a Green Deal can help to implement plans for sustainability which are related to, e.g. energy, climate, water, raw materials, mobility, bio-based economy, construction and food. Green Deals have proven to be useful tools to upscale existing projects and push for best practices. An example with respect to natural capital is the Transparency Green Deal that focuses on developing methods and tools that measure the impact and dependency on natural and social capital. Initially 19 parties signed to participate, later 15 more joined.

The effectiveness of policy options might change over time, as transformations happen and the transition becomes more apparent. Therefore, in due time different packages of policy options for an enabling environment could be distinguished:

Short-term delivery	Mid-term delivery	Long-term delivery
Reach out and help	Embed and institutionalize	
<ul style="list-style-type: none"> <li>– Build tools to support change (especially for SMEs and early adopters)</li> <li>– Shoulder tap (including CEO-networks)</li> <li>– Use dynamic networks</li> <li>– Build a narrative (including business case discussion)</li> </ul>	<ul style="list-style-type: none"> <li>– Invest in data</li> <li>– Develop benchmarks to ignite a 'race to the top'</li> <li>– Connecting to other policies (zombie-strategy)</li> <li>– Embed natural capital inclusive (public) procurement</li> </ul>	<ul style="list-style-type: none"> <li>– Embed natural capital in reporting frameworks and regulations</li> <li>– Embed natural capital in education</li> <li>– Internalize natural capital in prices</li> <li>– Enable For Benefit Corporations</li> </ul>

## 05 Towards a new business eco-structure

The Protocol is clearly the cornerstone of the Coalition's effort to cement the inclusion of nature in decision-making. However, as mentioned earlier, today's companies will only play a part in shaping the future. As much as we think of companies as eternal, they are not. A half-life of 10 years (for US companies) implies that in 2035, only a quarter of today's companies will be around.<sup>7</sup> As former Santa Fe Institute President Geoffrey West puts it "It's hard to kill a city, but easy to kill a company". Therefore, the Coalition's theory of change needs to go well beyond today's companies and reflect how it can change the design of the companies of the future.

### Harvesting the dynamics of networks

Different networks behave differently; some networks have high degrees of connectivity, others are sparse. Some are resilient, others vulnerable. Certain common networks such as the Internet are very resilient to random disturbance, but very fragile to targeted attacks.

In other words, not all networks are the same and knowing the particular topology of a network is important to be able to engage with it purposefully. For example, in some parts of the world, markets tend to be more concentrated than others, with power in the hands of a few very influential companies. In other parts of the world, state-owned enterprises dominate and can be more easily (and directly) influenced by government objectives.

The theory of change for natural capital could include for consideration an engagement strategy depending on the nature of the network. In a network perspective, this would require mapping their connections, in order to understand their topology. What are the highly connected nodes in this network? Who are the influencers and who are the followers? This approach would also include direct engagement with members of this network to understand their views as well as explore what narratives concern them and what tools would be useful for them to integrate nature into their governance.

There is a second reason why the focus on today's companies is not sufficient from a systems perspective. Just like the behavior of a bird flock is not determined by coaxing them to be better flockers individually, the collective behaviors of companies may not be determined only by getting each company to adopt the Protocol. The goal of the Coalition is to influence the collective behavior, which requires a reflection on how the sum of companies' behaviors comes together. This includes attempting to anticipate unforeseen effects, rebound effects and other emergent phenomena. In other words, the challenge is to change the whole system, rather than merely changing existing companies inside the system. Here, analyzing the knock-on impacts of a few companies adopting the Protocol may be useful. If some companies are managing natural capital better than others, and thus gaining better access to it, that may in turn jeopardize other companies' business models if they are therefore crowded out because they did not foresee the problem. This could either create resistance to the whole concept from those players, or wider adoption as late adopters realize they must address this issue if they are to continue to compete.

## 05 Towards a new business eco-structure Continued

### Narratives matter

In 1833, William Foster Lloyd, a Victorian economist, coined the phrase 'the tragedy of the commons' describing the effects of unregulated grazing on common land. Following a now-famous article in 1968 by Garrett Hardin, this became the accepted principle for framing our interactions with commons resources such as the fish stocks, forests or the climate. The 'tragedy of the commons' is a situation where the aggregate effect of individual decisions to maximize personal benefits in a public common is a resultant negative effect, a depleted common resource resulting in diminished collective and individual value. The standard recipe for solving depletion of natural resources has subsequently been regulation.

Elinor Ostrom has spent her life meticulously capturing the many situations where humans actually manage collective resources adequately. Recognized with a Nobel Memorial prize, she catalogued the pre-requisites for successful collective action. There are several, including a distributed form of overlapping governance that she coins as polycentric, but striking is the importance of shared narratives and stories. In addition to having visible and relevant information, the agents also need to have shared stories of successful collective action in the past.

The implication is that the language and the narratives around Natural Capital are an essential element of changing the way nature is treated. One of the concerns expressed is that the word 'capital' itself may well be problematic, as the nature of financial and natural capital are quite different. It is in essence linear and fungible, which nature is exactly not. For example, a large fish caught as part of an ensemble of large fish causes great damage to an ecosystem, but a large fish caught as part of an array of fish sizes much less so. The concept of capital is challenged to deal with this context dependence, yet it is at the center of the organizing principles of ecosystems.

Appropriate narratives can contribute to better integrating nature in decision-making, but they need to be tested and held up against principles such as those formulated by Ostrom.

These two considerations - different companies and different collective behaviors - necessarily require exploration and experimentation. Our knowledge and understanding of complex systems helps and give pointers, but it is not sufficient to provide a recipe. The boxes throughout this paper describe some of the associated ideas, such as For Benefit Corporations and the essential role of narratives. These ideas can have radical consequences: take for example For Benefit Corporations. If you decide that these new structures provide the best opportunity for the required change in social norms and behavior, then this would argue for opposing any efforts to include purpose in existing company law. In this perspective, this inclusion holds the danger of being the harbinger of a deeper lock-in of the current system, rather than enabling a shift to integrate considerations of nature in decision-making. For such a shift, the new structure would be required, as a way out of the current lock-in.

### Towards a new business eco-system

When one engages in any public activity at some scale, one is quickly placed before a stark choice: is the goal of your activity profit or an ideal? In the first case you will be steered into the kind of commercial vehicle that has evolved from a structure invented in the Netherlands in the 17th century to deal with the commercial risks around colonial enterprises. In the second case, you will be coaxed towards a foundation or its equivalent in other legal systems. Anyone who has worked for either knows this is a false choice. Very few companies exist solely to maximize profits and many foundations could use the operational discipline that the profit model imposes.

In a complexity frame, we surmise that we may be paying a hefty price from this forced duality. Since social norms co-evolve with the institutions and structures, it is plausible that some of the strongly consumerist norms that have evolved, are related to this bipolar structure. If one accepts that there may be some truth to this, how would you go about changing this?

In 2012, California introduced a new kind of legal entity, the 'For Benefit Corporation'. The intention is to mid-wife an entirely new asset class, where companies exist for a social, environmental or other purpose of their choice, and profit is merely an essential fitness criterion. Thirty US states have followed suit. It has attracted both existing corporates (e.g. Patagonia and Unilever's Ben&Jerry's), as well as social enterprises. In Europe, only Italy has draft legislation underway.

This is a complexity frame policy, because through purposeful legislation it creates a new space within which bottom-up innovation can occur. It also assumes that it must be highly adaptive, as unforeseen effects will crop up and requires tweaks. An interesting question is, are For Benefit Corporations an opportunity to create a space for companies to embrace Natural Capital?

Note that For Benefit Companies are different to the BCorp label, which is certification effort to support companies that serve social or environmental purposes. This is not inconsistent, but it is a more limited labeling model than defining an entirely new asset class.

These are undoubtedly impactful ideas in themselves, but even they can only be the start of a collective discussion, not the end of it.

## 06 Next steps

With this paper we do not aim to conclude discussions. We want to bring a new kind of thinking to help inform the development of an enabling environment that promotes better business decision-making by taking natural capital into account. We have raised questions by looking through a systems lens at natural capital adoption and used this to identify possible policy elements that could contribute to an enabling environment. We also have put these elements in a phasing perspective.

This clearly needs to be developed further, through a joint effort. In 2016, the Coalition will continue to develop suggestions and will seek collaboration with governments, international institutions, business, NGOs and science to further elaborate the options.

Building on these discussions, and on the results of the pilot-testing phase of the draft Protocol, the Coalition will prepare, in parallel with drafting the Protocol, and together with interested partners, a follow-up paper on an enabling environment for inclusion of natural capital in business decision-making.

## Notes

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