



# THE DITCHLEY FOUNDATION

**A NOTE BY THE DIRECTOR**

**DITCHLEY 16/06**

## **Can the earth still sustain us? Biodiversity, resources and pollution 16-18 June 2016**

### **Introduction**

The June 2016 conference, my last as Director, found us considering the extent to which our current economic practices and lifestyles were compatible with a healthy planet, able to sustain us into the future. We had seventeen nationalities and a wide range of views around the table, as well as an almost even gender balance, to help look at this fundamental issue. We were keen to avoid too much doom and gloom and, with the help of our expert Chair, aimed to focus instead on what could realistically be done. But we could not help reflecting from time to time on why it seemed so difficult to attract support for more radical action, given the obvious risks we were running.

### **Summary**

We were clear that we were facing very serious risks to the health of the planet and our sustainable presence on it. But quantifying or prioritising these risks was more difficult, because of their interconnectedness, and the impossibility of predicting how societies and people would respond as the situation evolved. Faced with this, one temptation was to exaggerate or sensationalise, to attract attention and/or funding, but this was ultimately counterproductive. We also regretted the way in which the environmental debate had been politicised, with certain causes taken over by the left, which produced an inevitable counter-reaction, and unhelpful north-south polarisation about who was to blame.

We therefore favoured a new narrative, with new language, which was more appealing to ordinary people and companies, and a simple vision of what we wanted our lives to be like in the future. The risks to that could then be identified and addressed in pragmatic and bite-sized fashion, in ways which were clearly linked to concerns about practical issues such as jobs and health. People needed to be engaged and empowered, not lectured at. Meanwhile we saw a strong requirement for education about environmental issues in schools to be stepped up, as this ball seemed to have been dropped in recent years.

But was popular mobilisation actually necessary for effective environmental action? Measures could be taken top down, and implemented without community consultation, however attractive the latter might seem. Most participants thought top down and bottom up were not alternatives. Governments could of course act of their own volition, but public pressure on environmental issues was usually required,

because the action was often not as self-evidently necessary as, for example, over health or education. Moreover, community buy-in helped ensure any action was sustained and effective.

We spent a lot of time on the risks to biodiversity (for which a new name more meaningful to the public would be good). These risks were great, not least from continued population growth and rapid urbanisation, but particularly difficult to quantify, and often apparently local more than global. The risks were greatest in the global south, but that was also where awareness of them, and readiness to act, where that might seem to threaten immediate economic goals, were lowest. Prioritising action was a real challenge in this area, and could not simply be determined by science. We should also accept much more readily than currently that action could not always be win-win, and often involved uncomfortable trade-offs and losers, who needed to be addressed and helped.

One main conclusion was that biodiversity risks could not be successfully addressed in isolation. Biodiversity concerns and actions needed to be mainstreamed into all kinds of infrastructure and other projects from the start, as well as into education and training at all levels. Otherwise, huge and irreversible damage to habitats and species was unavoidable as urbanisation continued apace. But the biggest drivers of risk were still our consumption habits and lifestyle choices, which were likely to prove increasingly unsustainable, for example in the areas of food and water. It was no good imagining that lecturing people about the need for dramatic change was going to be effective. Governments were also particularly cautious about decisive action in this demand-side area. Incremental change was therefore the realistic way forward, using health concerns as one obvious way into young people's attitudes in particular.

How far could we use economic tools to drive change? Not everything of value could be expressed in economic or financial terms, especially where the environment was concerned. But we had to act at the moment within the current political and economic paradigms. We saw no opposition between the use of economic incentives and of controls such as regulations. The key was to find the right mixture of measures for specific contexts and individual threats. There were plenty of tools in the toolkit, and it was better to go with the grain of markets where possible than trying to oppose or ignore them. We lamented the lack of progress in some obvious areas such as carbon pricing, and were not convinced that an effective global carbon price was anywhere in the offing. But that was no reason to give up.

How could we find ways to mobilise some of the trillions of dollars sloshing around the international system for environmental ends? We saw no easy solutions. Projects had to be viable to attract finance, and there were not enough good ones around in the environmental field. Over-restrictive rules set by governments and financial institutions about the weighting of risk did not help. Was there nevertheless a chance that the private sector would in practice start to take the lead in environmental action, driven by their own operational concerns, even if governments were too timid and short-termist to act? There were different views around the table. Companies and even financial institutions were beginning to take these issues more seriously. Responsible investment/divestment campaigns were starting to have some impact, helped by the concept of stranded/unusable assets, for example in the oil and gas sector. But we were not yet convinced that significant action would result unless companies' operations were seen to be directly impacted. That meant the onus was still on governments to come up with strong and effective regulatory measures in key areas, with an eye to long term effects. Companies liked predictability and would accept even tough rules as long as they thought a level playing field was being established – which put a premium on internationally coordinated measures wherever possible.

This was a practically oriented discussion where we tried to avoid all-encompassing truths or solutions, or too much philosophising about whether GDP was a good measure of important things. The reality of future environmental action would be messy and a mixture of public and private sector measures. It would often seem inadequate, and a Sisyphean struggle. But there were no silver bullets and no alternative to persistence and effort. Behind the disappointments progress was being made.

## **Main Note**

### **The risks**

No-one at the conference expressed serious doubt about the extent of the risks facing the planet (or more accurately the human presence on the planet), from factors such as climate change, biodiversity loss, environmental degradation and pollution, ocean acidification, continuing population rise, and increasing urbanisation. One obvious way in which all this could come together was a growing inability of the world population to feed itself sustainably, through lack of sufficient usable land and water. However, it was more difficult to put these risks in any kind of order of priority, and to come up with reliably quantifiable indicators or timescales of dangerous change for some of them, particularly biodiversity loss. The risks from climate change came closest, with the targets set at the Paris COP21 meeting. However, even here no-one round the table thought either the 1.5 degree target, or even a 2 degree target, likely to be met in practice. And there was little good research so far about what a world of 3 or 4 degree temperature rise would actually be like, for example for agriculture. In any case, trying to put the fight against climate change ahead of efforts to combat other risks made no sense in the interconnected world in which we lived.

We therefore faced a lack of predictability, which more scientific research would be unlikely to change fundamentally, because of the impossibility of predicting accurately how societies, governments, businesses, ecosystems and people, with all the scope of human ingenuity, would respond to change as it occurred. Extrapolations from where we were now were only of limited value. The biggest source of unpredictability was precisely the interconnectedness of the risks we were discussing. None could readily be separated from the others, and each would be profoundly affected by what was happening elsewhere. The links between climate change and biodiversity loss were obvious, for example. But that did not mean we could easily know how these links would play out in practice over the next 50 years.

One result was a tendency to highlight worst case scenarios, in an attempt to gain attention and traction from governments and publics alike, because they were looking for clarity and clear answers to tough questions. Another manifestation was scientists being tempted to exaggerate their cases and findings in order to attract more funding. This might be understandable, and done from the best of intentions, but it risked being counterproductive, especially when predictions of catastrophe did not come to pass as quickly as had been claimed. There was a fundamental difficulty here about how to present the severity of the risks the world faced without turning people off, and how to present nuance and uncertainty. Some of the criticism of exaggeration was no doubt unfair. The optimists about climate change and other phenomena seemed to be allowed to get away with their own exaggerations without challenge. Nevertheless, this problem could not be dodged.

All this had been exacerbated by the way in which the environmental and climate change debates had become politicised. The political left had taken ownership of the issues, particularly in the developed world, and linked them to an anti-capitalist agenda. This had led to the alienation of the political right, the development of an anti-climate change discourse, and the emergence of a difficult political context

for efforts to solve these complex problems. A different kind of politicisation of the climate change debate, between global north and global south, over who was responsible for the problems and therefore who should take responsibility for fixing them, had not helped the search for solutions either, however justified the accusations against the north might be.

None of this meant that we should relax our scientific efforts to understand what was happening to the planet. We were for example deeply concerned to hear that the study of botany appeared to be in steep decline, even though most plant species were still not yet properly classified. This seemed very short-sighted. However, we did need to appreciate the clear limits on the scientists' ability to predict exactly what was going to happen and when. We also needed to get away from thinking of the risks as existing in separate silos.

Our conclusion was that we needed to find new ways of framing this debate, getting away from the search for absolute truth, and focussing the discussion on the risks and uncertainties we faced as a species, and the need to manage these risks sensibly. One way to do this was to articulate a vision of what we wanted our lives to be like in 50 or 100 years' time, to explore and consider the risks to achieving that future, and then to try to agree on practical ways of reducing and mitigating those risks. These solutions should be pragmatic and meaningful to people's lives now, not appear as impossible dreams or big risks in themselves, and wherever possible be presented as opportunities, if we really wanted to get traction. People's mind-sets were not well geared to thinking about long-term risks or long-term solutions, and this needed to be factored into our approaches. We also needed to express these things in language which resonated with companies and ordinary people, not just other environmentalists.

We also needed to recognise that environmental issues could never capture people's undivided attention, however important they might seem to those living in the environmental bubble, and that environmental threats were not separate from everyday questions about economic prosperity, livelihoods, jobs, food and health, but were intimately connected to them. Breaking down the big issues into their component parts and finding policy steps which made a difference to everyday lives, while also contributing to solving the big issues, made a lot of sense. Health issues could be a particularly effective way into environmental issues, for example. There was an obvious danger in all this that such an approach would never generate the pace or scale of change necessary to avert the huge risks we now faced, but the politicisation of the debate could probably not now be reversed in the immediate future. Other approaches therefore had to be tried.

As part of this debate, there was a lively exchange about the need for and relevance of public or community mobilisation for effective environmental action. It was argued that some activists seemed to regard this as indispensable, and an end in itself, in a way they would not over other political issues such as education or health. They were correspondingly reluctant to acknowledge action which did not come via the community route. Others argued that the reality was that much actual change came from top-down government decisions and regulations, and that such decisions in some countries were made by undemocratic governments little interested in the views of their citizens. They could nevertheless still be effective, for example in helping save a threatened species. Too romantic a view of environmental action could even be unhelpful, because the search for the holy grail of community engagement and support distracted attention from the goal.

This was vigorously contested by another group round the table. Education and health were down-to-earth issues which concerned everyone in their daily lives and automatically generated attention from

governments and publics alike. Environmental concerns were usually more abstract, and governments would always tend to ignore them unless there was an active, well publicly-supported lobby holding their feet to the fire. The choice was not therefore between top down and bottom up. Both were needed, particularly in democracies, if enough action was to result.

All sides in this discussion were agreed that, in any event, committed and influential leaders and influencers were needed, whether at community or governmental level. Without them, precious little would happen.

We also discussed how the public should be brought into the environmental debate more effectively. The general view round the table was that people needed to be engaged and empowered, not simply told about issues. They appreciated a genuine dialogue about issues which mattered to them, and to feel that things were being done by them or for them, not to them. This might mean putting the campaigning focus on a particular issue or species, like bees or hedgehogs, even when these concerns were not central to mankind's survival. Once engaged in this way, people were more likely to move on to the bigger issues than if they had simply been lectured about them in the first place. More attention also needed to be paid to engaging people's emotions as well as to rational argument, to use of role models to whom people would be likely to listen, for example celebrities, and to better exploitation of social media.

One point on which all were agreed was the need to do much more to educate children and young people about the environmental risks to the world they would be inheriting. There had been good progress on this in the 1970s and 1980s, in various countries, but more recently we seemed to have dropped the ball. A fresh look at the curriculum was needed in many places. This was not just about providing information but also about fostering greater scientific literacy, to enable people to understand scientific arguments better and navigate the vast volumes of information now available from the internet with more skill and discrimination.

### **Maintaining biodiversity**

The objective of stopping biodiversity loss and preserving a wide variety of species was widely agreed to be vital. Species loss was not new but current rates of extinction were alarming. However, it was clearly not enough just to say that for effective action to follow, and a number of barriers to action were identified. The first was the term itself, which did not resonate with the wider public beyond academia and conservation bodies, and indeed did not mean much at all to most people. Other terms such as 'the fabric of life', or 'life on earth', or even simply 'nature', might represent better what we were talking about, as long as we did not just equate nature with wilderness. We also needed to be careful not just to talk about conservation. Nature was constantly changing, as different parts of it and different species interacted in dynamic and evolving ways. We could not simply try to stop the clock at a particular moment in time.

It was also often difficult to quantify how and why biodiversity mattered. Some elements of it, such as the continued existence of large masses of vegetation and healthy oceans for our climate, were clearly of global or regional importance. The benefits of other parts were much more local, and had multiple values for people, related to their culture, ways of life, and relationships to their surroundings, as well as economic and ecological value. It was often hard or impossible to attach meaningful financial figures to particular species or habitats, especially given the interconnectedness of so much of what we were

talking about. Not everything which mattered could be measured, but this problem did not make pushing through effective policy steps any easier.

The risks to biodiversity were meanwhile not evenly distributed around the world. Losses were much greater and more widespread in the global south, but concern about biodiversity tended to be greater in the north. Many people in the south were too focussed on survival to think much about environmental worries, even though these might be precisely what would threaten most their economic survival in the longer run. There was also an attitude among some developing country governments that they could worry about biodiversity concerns once they had sorted out their economic development. This was short-sighted, and erroneous, since a lot of the losses would not be reversible. All in all, biodiversity concerns were certainly not, and should not be seen as, a 'luxury' only open to rich countries and communities.

One of the big challenges now was how to decide priorities for investment and effort. The answers would in many cases come not from science, though science had a vital role to play in helping decide how to tackle the problems, but from the complex interplay of different interests and values in particular societies. People were often very concerned about and attached to their immediate environment, although views could well differ about the importance of a particular landscape, compared to the economic value of a traditional activity threatening that same landscape. There would always be uncomfortable trade-offs and compromises to be made, especially about the critical question of land use. The effects on 'losers' had to be considered. For example, how should the risks of erosion of a traditional upland habitat be weighed against the wishes and interests of those who grazed their sheep there, and what should be offered to farmers being told they could no longer use that land?

The difficulty of prioritising also applied to western donor governments trying to decide the relative merits of action at home to protect a humble species with popular appeal, and action overseas on a project of much bigger global significance, but with less control of the process or of the results. Similarly there could be uncomfortable choices between major 'brand' species like tigers or rhinos, which had huge symbolic value, versus habitats or plants with a much lower profile but possibly a much more important economic, social or environmental impact.

We had the same debate on the ways to make things happen over biodiversity as over environmental action more generally – top down v. bottom up. There was the added element that so much action on biodiversity was around communities, which meant committed local leadership was especially vital. Community buy-in would normally mean that a policy was more likely to be sustainable over time. Nevertheless, we had to acknowledge that top down action could still be effective, and could be helpfully taken in some cases even without consulting local communities.

Perhaps our most important conclusion was that biodiversity projects on their own were never likely to be enough to have the necessary effects. Biodiversity concerns therefore needed to be mainstreamed into all economic and development activity. This was particularly obvious when we looked at the amount of new construction of infrastructure and housing coming our way, in developed and especially developing countries, because of the population growth and urbanisation of the coming decades. City developments equivalent to 175 times the current size of London were in the pipeline. Unless biodiversity was mainstreamed into these projects from the start, huge and largely irreversible damage could be done to species and habitats. For the moment there was little or no sign of this kind of mainstreaming at international or national level, for example either in the G20 documents about future

infrastructure, or in the work of the Infrastructure Commission in the UK. Changing this should be a major priority, though we were better at saying this than at explaining exactly how this should be done.

Mainstreaming should also go further, into agriculture and agribusiness projects, and into the education and careers of engineers and businessmen as well as life scientists, as a crucial factor for growth and prosperity as well as for lifestyle, well-being and justice.

Despite these fears about the direct effects of future urbanisation and construction activity on biodiversity, we also recognised that much, perhaps most, of the damage came indirectly from our styles of living and particularly patterns of consumption. Consumption of raw materials was growing faster than the global population rise because of greater prosperity and changing habits in some major countries. There was a very direct effect on ecosystems from the raw materials we used, the way we used them, and the extent to which we re-used or recycled them. The most obvious example, but far from the only one, was in the area of food. So-called western diets with large amounts of red meat were increasingly unsustainable, even in the west, because of the amount of land required to produce the protein. As and when the citizens of other countries became prosperous enough to demand similar diets, for example hundreds of millions of Chinese and Indian people, this unsustainability became much more dramatic. At the same time it was not politically or morally acceptable/possible to say to those in the developing world that they could not or should aspire to what was available elsewhere.

In a similar way, environmental improvements in developed countries did not always translate into global benefits. Western societies might reduce their own waste and emissions, but if they were outsourcing manufacture of many products to developing countries, the overall effect might be the opposite as products were made in countries without good policies in place to reduce waste, pollution and emissions. It was said, for example, that Europe's environmental footprint was three times its geographical size because of what it imported from elsewhere.

There were differing views on the extent to which it was possible to change consumption habits by telling people they had to change their way of life, or trying to pressure them to do so. Some saw little alternative, given the size of the risks, even though it was clear that governments preferred action on the supply side rather than the demand side. However, the majority did not believe this was a viable way forward in current political and economic circumstances. It risked putting people off environmentalism for little real gain. The best hope was to encourage incremental change and hope that gradually different habits would take hold, for example over diet, or aspects of the so-called sharing economy, and be seen to be 'cool'. That could happen first of all in the west, with others elsewhere then imitating this, just as they tended now to imitate current unacceptable and unsustainable habits. There were already a few signs of this in some areas. Health concerns, already a major factor for many young people, were probably the best way into this, since health and environmental benefit could obviously go together.

### **Environment and economics: the cost/price of environmental risks**

Much of our discussion was about the necessity and value of using economic and financial tools to achieve environmental objectives. We were tempted at times to go down the path of a broader discussion about what the economy was for, whether economic growth was an aim that made sense in terms of people's real well-being, and whether we needed a new paradigm altogether. Green GDP and green accounting were touched on at different times. We were also reminded regularly by several

participants about the importance and risks of economic inequality in the world, and the dangers of inter-generational inequity.

However, without in any way dismissing these ideas, we by and large avoided the temptation to get stuck on this kind of discussion, and tried to focus instead on how to find practical ways forward within current economic and political frameworks. We were nevertheless keen to underline that economics as currently practised could not capture the full value of environmental goods, since some had ecological, cultural, and emotional elements which could not be measured by current tools.

What was the right balance to be struck between using the economic toolkit of incentives, subsidies, and taxes on the one hand, and command and control measures such as laws and regulations on the other? We thought that there could be no question of trying to choose between the two. Both were needed, and the mixture to be applied in any particular context had to be considered and decided intelligently. There were no one-size-fits-all solutions. In fact governments had plenty of tools of both kinds at their disposal. They just needed to use them with greater discrimination, determination and vigour if they really wanted to achieve change that mattered, and contribute to the ultimate aim of a sustainable and resilient environment.

The most obvious form of an economic lever to achieve environmental ends, in the climate change context, was putting a price on carbon. This was widely accepted, even by many big polluters (albeit hypocritically in some cases), as the right way forward to help reduce emissions. There were many national and local versions of carbon taxes or cap and trade schemes, and some successful examples, for example in Sweden. But many schemes were ineffective or half-hearted, and there had been little or no progress towards a global carbon price, let alone one at a level which could make the kind of difference likely to make the Paris targets achievable. Why was this? There was no simple answer. Powerful lobbying of governments by important industries was certainly a big part of it. Individual governments could also always point to the absence of action elsewhere in the world and the need for a level playing field in order to justify their own timidity.

However, it might just be necessary to accept that the complexities of setting and having respected a global carbon price were too great in present circumstances, and that the right approach was to encourage each government to put in place the best mixture of policies and measures to achieve results in their own political and economic context. This could include carbon taxes or cap and trade schemes, but also have in the mix serious energy efficiency measures (always neglected despite the major gains which could be achieved), help for renewables, and incentives for less polluting technologies (for example in steel-making). These could add up to an effective approach if pursued with enough vigour, and could also more easily go with the grain of companies in developing countries which were reluctant to allow environmental concerns to affect their bottom line when making investment decisions. One country to watch was China, which might go for a carbon pricing scheme soon, and might be less susceptible to lobbies against toughness.

On the financial side, there was a major conundrum. Trillions of dollars, in pension and other funds, were sloshing around the world looking for a home where they could make a decent return. The world was full of things needing to be done, from basic infrastructure to environmental projects, and interest rates were at historic lows. Yet there seemed to be no way of putting the money and the project together. Why was this? The simple answer was that the projects concerned were not seen as likely to generate a sufficient return to justify the investment. This applied as much to non-environmental

schemes as to environmental ones. Yet there was evidence that some environmental schemes could in principle generate very high rates of economic return.

There seemed to be two factors at play here. One was the absence of enough really good environmental projects, even for donors willing to fund them, never mind financial investors looking for a profit, and a distinct lack of absorptive capacity in developing countries. The other was the detailed rules about risk weighting applied not only by commercial lenders but also by the International Financial Institutions, which effectively made even good projects appear unviable. Partly as a result, efforts to use public money to leverage private finance, for example through the Green Climate Fund, had made little progress so far. So-called green bonds were attractive to some investors, at least in the sense that those available were snapped up by funds which needed to meet quotas for responsible investing. But the scale remained very small. Again, detailed finance ministry rules about risk weighting and liability seemed to be at least partly to blame. Perhaps it might be necessary to accept that green financing would never come from the big battalions, but would have to come from smaller organisations and institutions.

To what extent might wider changes in investment policies, or divestment policies, in favour of environmentally sound activities and projects and against the opposite, start to make a real difference to business practices? This was already happening to a limited extent, for example the market's effective abandonment of coal companies, but not on a significant scale otherwise. Companies would in the end listen mostly to their financial backers, investors or shareholders, and the latter did not seem to be putting much pressure on them for now. Nevertheless there was behind the news a drumbeat of pressure on funds from NGOs and other activists to be more responsible about their investments, and more transparent too. Car manufacturers could be vulnerable, as well as oil and gas companies. Some public statements, such as the speech from the Governor of the Bank of England in September 2015 warning investors not to ignore environmental concerns, could be seen as straws in the wind. The concept of stranded assets, such as un-burnable fossil fuels on the books of oil and gas companies, was increasingly widely understood, if not yet widely acted upon, because of the perception that there was as yet no viable alternative to fossil fuels to meet rising world energy demand, particularly for transport. We also needed to recognise that many of these assets were in the hands of governments around the world, not private companies, and were therefore not susceptible to investor pressure in the same way.

The wider question here was whether the private sector, both business and finance, would finish up leading the charge towards more sustainable policies, for practical reasons of their own, while governments continued to dither and worry more about short-term priorities such as jobs than the environment and long-term issues. We were not sure this would prove to be the case. Companies tended to act only when a particular problem, such as lack of water availability, threatened their operations directly. They would not usually act out of altruism, or even concern about the planet and their children's future, though individual bosses might be influenced by this up to a point. On the other hand, there was no doubt that some companies were beginning to see links between their viability and the resilience of the societies in which they operated, and to start to draw conclusions accordingly. Parts of the financial industry were having similar thoughts. In some sectors, company bosses had to think long term, especially when making new investments, and were beginning to factor in more explicitly longer term elements such as the environment in which they would be working.

In the end, we suspected, the primary responsibility would always be on governments to set the rules and regulations of the game. Even when there was resistance and controversy, when push came to shove companies liked clarity and predictability about the rules and would follow them, as long as they also thought that overall a level playing field was being created. So governments had to be bolder, more imaginative and more focussed on long-term benefits in how they shaped the future context.

This discussion too came back to the question of how to frame the overall narrative. The discourse of fear about coming disaster had not worked in mobilising governments or publics, and tended if anything to engender feelings of hopelessness and helplessness. What was required was a more positive and hopeful agenda, which fitted better into people's wider economic and social concerns, as well as a more realistic one. On the latter point, while there was certainly no need to accept any suggestion that environmental action and economic growth automatically pulled in opposite directions, utopian suggestions that environmental action could usually be win-win for everyone could be naive and had not worked. There would always be trade-offs to be made, and nearly always some losers from these trade-offs. That should be acknowledged up front and wherever possible exit strategy measures put in place to help/compensate the losers.

A case in point was the coal industry in developed countries, now in disarray because of the shift to less polluting fossil fuels, and low prices for these. Much of it would no doubt close in the next few years, which would be great for the environment overall, but not for those who lost their jobs or pensions, and not necessarily for the objective of effective clean-up of the damage done by coal-mining by those responsible. These problems needed to be factored in, and appropriate compensatory measures taken, not least because this would help soften resistance to change in other industries likely to follow the same route in due course.

One area of interest and difference in all this was the role of technology. Technological fixes to environmental problems were seen by some activists as not really legitimate, because they did not contain within them the elements of ethics and values which were seen as crucial for moves towards sustainability. On the other hand they should not be dismissed when they really could make a difference in circumstances where other measures were simply not going to work, or at least not going to work in time. Carbon capture and storage was an obvious example. Effective and affordable technology could make a big difference to emissions, for example from coal-fired power stations in countries like China and India, though it could also be seen as enabling use of coal to continue for longer. There was no obvious right answer to such questions but they should be looked at on a case by case basis, without either being obsessed by technology, or allowing the best to be the enemy of the good for purist reasons. We also noted that technology might be much more relevant, and effective, in the area of climate change than in that of preserving biodiversity; and that encouraging more disruptive technologies in the environmental area might be a good way of breaking up the lobbying power of vested interests.

## **Conclusion**

The conference was marked by a desire not to fall into the trap of trying to articulate all-encompassing truths, or recommend all-encompassing solutions. As in other areas of modern international life, there were no silver bullets, and no simple, multilaterally-agreed ways forward. Action would be messy and taken for a variety of reasons by a wide variety of public and private stake-holders. We needed to keep experimenting to see what worked, and then scale that up wherever possible. Such action might often be seen as insufficient. It might often feel, as one participant commented, that we were trying to do a

complicated jigsaw without the benefit of the picture on the top of the box. But behind the disappointments, progress was being made, and understanding of our dependence on a healthy environment and a healthy planet was growing. Concepts such as planetary boundaries and natural capital were helping with this. Long-term persistence was required to change mind-sets and habits, and there would always be plenty of opposition from economic incumbents and potential losers. That was a reason to press on and continue the fight, not lose heart or retreat back into a self-comforting bubble.

*This Note reflects the Director's personal impressions of the conference. No participant is in any way committed to its content or expression.*

**CHAIR: Dr Tony Juniper**

President, Wildlife Trusts (2015-); co-Founder, Robertsbridge consultancy group (2010-); Fellow, Institute of Sustainability Leadership, University of Cambridge (2008-); Special Advisor, Prince's Charities International Sustainability Unit; President, Society for the Environment; author, 'What's really happening to our planet?' (pub. June 2016). Formerly: Executive Director, Friends of the Earth (2003-08); Vice Chair, Friends of the Earth International (2000-08).

**ARGENTINA**

**Professor Sandra Díaz PhD**

Director, Núcleo DiverSus for Diversity and Sustainability; Professor of Community and Ecosystem Ecology, Universidad Nacional de Córdoba, Argentina; Senior Researcher, National Research Council (CONICET), Instituto Multidisciplinario de Biología Vegetal (IMBIV), Argentina; Multidisciplinary Expert Panel member, Intergovernmental Platform on Biodiversity and Ecosystem Services; Science Committee member, Future Earth. Formerly: Science Committee member, DIVERSITAS global programme; coordinating lead author for biotic regulation of ecosystems, Millennium Ecosystem Assessment.

**AUSTRALIA**

**Mr Keith Tuffley**

Managing Partner and CEO, The B Team.

**AUSTRIA**

**Eva Maria Mayerhofer**

Lead Environment and Biodiversity Specialist, European Investment Bank, Luxembourg (2005-).

**BRAZIL**

**Ms Melina Sakiyama**

Global South Focal Point, Global Youth Biodiversity Network

**CANADA**

**Dr Christen Audet**

Director, Project Development, AECOM (2008-); Vice-President, Environment, Quest Rare Minerals Ltd (2015-); Member, Canadian Institute of Forestry. Formerly: Environmental Audit Program Manager; University of Montreal Lecturer on Socio-ecological Systems; Guest Lecturer on biocultural diversity; Intergovernmental Advisor on World Heritage landscapes in the Mediterranean; Researcher on culturally protected woodlands in France; Forest Ecologist in Canada and Latin America.

**Dr Howard Browman**

Principal Research Scientist, Institute of Marine Research, Bergen, Norway (1998-); Editor-in-Chief, ICES Journal of Marine Science (2012-); member, Council of Science Editors' Editorial Policy Committee. Formerly: postdoctoral fellowships: University of Montreal, University of Victoria; Research Scientist, Department of Fisheries and Oceans Canada.

**Ms Janine Ferretti**

Head, Environmental and Safeguards Division, InterAmerican Development Bank, Washington, DC. Formerly: Executive Director, North American Commission for Environmental Cooperation (1994-2002); Executive Director, Pollution Probe (1991-94).

**Ms Ellen Quigley**

PhD Candidate in Economics Education, University of Cambridge.

**The Hon Bob Rae PC CC OOnt QC**

Senior Partner, Olthuis, Kleer, Townshend, Toronto; Lecturer, University of Toronto School of Governance and Public Policy. Formerly: Member of Parliament for Toronto-Centre (2008-13); Interim Leader, Liberal Party of Canada (2011-13); Partner, Goodmans LLP, Toronto (1996-2007); Leader, New Democratic Party of Ontario (1982-96); Premier of Ontario (1990-95); Chairman, Forum of Federations and the Institute for Research in Public Policy; Member, Security and Intelligence Review Committee for Canada; member of the Board of Directors, The Canadian Ditchley Foundation.

**CANADA/GERMANY****Dr Claudia Ringler**

Deputy Division Director, Environment and Technology Production Division, International Food Policy Research Institute, Washington DC; co-leader, Managing Resource Variability and Competing Uses Flagship, CGIAR Research Program on Water, Land and Ecosystems; Chair, Food, Energy, Environment and Water Network.

**GERMANY****Mr Christian Schwarzer**

Steering Committee Member and Co-Founder, Global Youth Biodiversity Network; Youth Ambassador for the UN Decade on Biodiversity.

**INDIA****Mr Ravinder Pal Singh**

CEO and Secretary General, WWF-India (2003-). Formerly: General Manager and Head, Multinational Corporates, Deutsche Bank, Mumbai.

**JAPAN****Mr Hiroyuki Tezuka**

General Manager, Climate Change Policy Group, JFE Steel Corporation; Chairman, Working Group on International Environmental Strategy, KEIDANREN; Visiting Researcher, Graduate School of Public Policy, The University of Tokyo (2014-); Member, Private Sector Advisory Group, Green Climate Fund (2014-). Formerly: Visiting Fellow, Brookings Institution; Chief Washington, DC Representative, NKK Corporation; Assistant to the CEO, National Steel Corporation.

## **NEW ZEALAND**

### **Mr Benjamin Abraham**

DPhil Candidate in Public Policy, St Catherine's College, University of Oxford (2015-). Formerly: Policy Analyst, New Zealand Youth Delegation to COP21; Research Assistant, Galvanizing the Groundswell of Climate Action independent evaluation of the Lima-Paris Action Agenda for COP21; Intern, New Zealand Permanent Mission to the United Nations, New York.

## **OECD/GREECE**

### **Dr Katia Karousakis**

Biodiversity Team Leader, Climate, Biodiversity and Water Division, Environment Directorate, OECD, Paris.

## **RUSSIAN FEDERATION**

### **Ms Irina Fedorenko**

DPhil Candidate in Geography and the Environment, University of Oxford; Weidenfeld-Hoffmann Trust Scholar; co-Founder, BubbleNut Wash.

## **SPAIN**

### **Mr José Enrique Bofill Maestre**

Regional Director, MENA-Asia, Aqualia Gestión Integral del Agua, Madrid (2015-); Advisory Committee Member, Saudi Water and Power Forum; Member, Spanish Society of Civil Engineers; Member, Spanish Association for Desalination and Water Reuse. Formerly: Director Middle East, Aqualia Gestión Integral del Agua, Madrid (2008-15); Aqualia Infraestructuras: Commercial Director (2006-08), Construction Director (2004-06); Director, Technical Department (2000-04).

## **SWITZERLAND/GERMANY**

### **Mr Friedrich Wulf**

Head, International Biodiversity Policy, Pro Natura - Friends of the Earth Switzerland (2008-); International Biodiversity Campaigner, Friends of the Earth Europe; Secretary, Swiss IUCN Committee; Coordinator, Biodiversity Working Group of the German NGO Forum Environment and Development. Formerly: Board member, CBD Alliance (2008-16); Member, Friends of the Earth International steering group of the Cross-programme project "Climate and Biodiversity Finance" (2011-13); Head, Nature Conservation and Water Policies, BUND-Friends of the Earth Germany (2006-08).

## **UK**

### **Dr Sue Armstrong Brown**

Policy Director, Green Alliance (2014-). Formerly: Trustee of Wildlife and Countryside Link (2011-14); Head of Policy, Royal Society for the Protection of Birds (1999-2014); Scientific Advisor, Environment Group, then Ministry of Agriculture, Fisheries and Food; Environmental Research Scientist, Soil Survey and Land Research Centre.

### **Mr Rob Bailey**

Research Director, Energy, Environment and Resources, Chatham House (2014-). Formerly: Senior Research Fellow, Chatham House; Head of Economic Justice, Oxfam GB; Consultant, Oliver Wyman. Coordinating Lead Author, UNEP Sixth Global Environment Outlook.

**Mr Craig Bennett**

Chief Executive Officer (2015-), formerly Director of Policy and Campaigns, Friends of the Earth (England, Wales and Northern Ireland) and Board Member, Friends of the Earth Europe; Policy Fellow, Centre for Science and Policy, University of Cambridge; Senior Associate, formerly Deputy Director, University of Cambridge Institute for Sustainability Leadership; Member, Net Positive Advisory Board, Kingfisher plc; Chair, Environment and Climate Change Panel, Customer Engagement Forum, Anglian Water. Formerly; Director, The Prince of Wales's Corporate Leaders Group on Climate Change.

**Mr Richard Black**

Director, Energy and Climate Intelligence Unit, London. Formerly: Director of Communications, Global Ocean Commission; BBC: Science Correspondent, then Environment Correspondent.

**Mr Mark Johnston**

Group Ecologist, BP International plc. Formerly: Associate Director, Mott MacDonald; Senior Lecturer in Applied Ecology, University of the West of England, Bristol; Vice Chair, Biodiversity and Ecosystem Services Working Group, International Petroleum Industry Environmental Conservation Association; Chair, Cross Sector Biodiversity Initiative.

**Professor Georgina Mace DBE, FRS**

Professor and Director, Centre for Biodiversity and Environment Research, University College London; Council Member, Natural Environment Research Council (NERC); Council Member, Royal Society; Member, UK Natural Capital Committee.

**Mr Justin Mundy**

Director, International Sustainability Unit, The Prince of Wales's Charitable Foundation. Formerly: Managing Director, Climate Change Capital; Senior Adviser, Global Markets Group, Deutsche Bank; Director, Aon Carbon; Founder, ForestRe; UK Government's Sustainable Energy Policy Advisory Board (2003-07); Head, World Bank's forestry and biodiversity programmes, Russia and Central Asia (1992-98).

**Mr Rory Stewart OBE MP**

Environment Minister (Parliamentary Under Secretary of State for Department of Environment, Food and Rural Affairs) (2015-); Member of Parliament (Conservative) for Penrith and The Border (2010-). Formerly: Chair, Defence Select Committee (2014-15); Member, Foreign Affairs Select Committee (2010-14); Ryan Family Professor of Human Rights, Harvard University; Director, Carr Center for Human Rights Policy, Harvard Kennedy School; Founder and CEO, Turquoise Mountain, Kabul (2006-08); Coalition Deputy Governor, Maysan and Dhi Qar Provinces, Iraq (2003); HM Diplomatic Service: postings to Indonesia and Montenegro; British Army. A Member of the Programme Committee and a Governor of The Ditchley Foundation.

**Miss Anna Swaites**

SABMiller plc, London (2012-): Director, Sustainable Development, and former Head of Livelihoods, Land and Food Security; Non-Executive Director, SABMiller India; Board Member, New Vision for Agriculture; Grow Africa Business Champion; mentor, Fifty Feet Women. Formerly: led cocoa sustainability programmes, Kraft and Cadbury.

**UK/USA****Ms Alexandra Kennaugh**

Senior Director, Strategy & Research for Communications, and Wildlife Trade Analyst, Natural Resources Defence Council (2003-). Formerly: Director of Operations, Shared Interest, New York and Johannesburg (2002-04); Agroforestry Program Associate, Conservation International (1999-2001).

## **UNESCO/CHINA**

### **Mr Han Qunli**

Secretary, Man and the Biosphere (MAB) Programme, and the World Network of Biosphere Reserves, UNESCO. Formerly: MAB Programme and Natural World Heritage sites (1989-).

## **USA**

### **Ms Jane Elder**

Executive Director, Wisconsin Academy of Sciences, Arts & Letters. Formerly: Founding Director, Great Lakes Program, and Head of Midwest Office, Sierra Club; Founding Director, Biodiversity Project; advisor, 'U.S. In the World' Rockefeller Brothers Foundation initiative on U.S. global engagement; lead writer-researcher, Presidential Climate Action Plan (under the auspices of the University of Colorado-Denver School of Public Affairs).

### **Mr David Festa**

Environmental Defense Fund, San Francisco (1993-): Senior Vice President, Ecosystems Programme. Formerly: Oceans Programme, EDF; President, California Fisheries Fund; Obama transition team, U.S. Department of Commerce; Director of Policy and Strategy Planning, U.S. Department of Commerce; Deputy Director, Center for Clean Air Policy; Senior Consultant, Environmental Resources Management Inc.; Analyst, Office of Technology Assessment, U.S. Congress; Correspondent, The Economist.

### **Mrs Patricia Mulroy**

Maki Distinguished Faculty Associate and Program Lead, Water Resources and Technology, Desert Research Institute, Las Vegas; Non-Resident Senior Fellow for Climate Adaptation and Environmental Policy, Brookings Institution, University of Nevada Las Vegas. Formerly: General Manager, Las Vegas Valley Water District (1989-2013); General Manager, Southern Nevada Water Authority; President, Association of Metropolitan Water Agencies; Chair, College of Sciences Advisory Board, University of Nevada, Las Vegas; First Chairperson, Western Urban Water Coalition; Board Member, Colorado River Water Users Association.

### **Ms Kristin Rechberger**

Founder and CEO, Dynamic Planet. Formerly: Advisory Council, World Economic Forum; Senior Vice President, Global Programs and Partnerships, National Geographic Society (1998-2002); Luce Foundation Fellow, Seoul.