

Innovation

for Sustainable Development

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Damien Demailly, Raphaël Jozan and Sanjivi Sundar (Associate Editors)



A Planet for Life

SUSTAINABLE DEVELOPMENT IN ACTION

Innovation for Sustainable Development

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■ **The Agence Française de Développement (AFD)** is a public development finance institution that has been working to fight poverty and foster economic growth in developing countries and the French Overseas Provinces for seventy years. It executes the policy defined by the French Government. AFD is present on four continents where it has an international network of seventy agencies and representation offices, including nine in the French Overseas Provinces and one in Brussels. It finances and supports projects that improve people's living conditions, promote economic growth and protect the planet, such as schooling for children, maternal health, support for farmers and small businesses, water supply, tropical forest preservation, and the fight against climate change. In 2012, AFD approved €7 billion to finance activities in developing countries and the France's overseas provinces. The funds will help get 10 million children into primary school and 3 million into secondary school; they will also improve drinking water supply for 1.79 million people. Energy efficiency projects financed by AFD in 2012 will save nearly 3.6 million tons of carbon dioxide emissions annually.

More information and publications available at www.afd.fr/lang/en/home

■ **The Institute for Sustainable Development and International Relations (IDDRI)** is a non-profit policy research institute based in Paris. Its objective is to determine and share the keys for analyzing and understanding strategic issues linked to sustainable development from a global perspective. IDDRI helps stakeholders in deliberating on global governance of the major issues of common interest: action to attenuate climate change, to protect biodiversity, to enhance food security and to manage urbanisation. It applies a cross-cutting approach to its work, which focuses on five themes—global governance, energy and climate change, biodiversity, urban fabric, agriculture—and one cross-disciplinary programme—new prosperity.

More information and publications available at www.iddri.org

■ **The Energy and Resources Institute (TERI)** was set up in 1974 to deal inter alia with issues relating to sustainable development, the environment, energy efficiency and the sustainable use of natural resources. Its goal is to develop innovative solutions for achieving sustainable development. Its activities range from the formulation of local and national strategies, to proposals for global solutions, to energy and environment-related issues. TERI is based in New Delhi, and also present in many other regions of India. It has over 900 employees and is headed by Rajendra K. Pachauri who is also the Chairman of the Intergovernmental Panel on Climate Change (IPCC), which was awarded the 2007 Nobel Prize.

More information and publications available at www.teriin.org

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Jean-Yves Grosclaude, Rajendra K. Pachauri and Laurence Tubiana (Editors)

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Foreword

Foreword propose par PapTalla, non revu par auteurs, non revu par Jim et Katell. Major twenty-first century challenges force us to rethink twentieth-century development paradigms. Rapidly growing urban populations, climate change, and the negative social and environmental effects of current forms of economic growth will oblige us to build a new operational framework for development. As development practitioners, we see innovation as the key to unlocking these apparently irreducible issues and opening the door to new trajectories and transitions.

Rising as a counterpoint to today's challenges, we see deeply transformative and hope-inspiring new models and technologies, such as "green tech," nanotech, and digital computing and communications; these innovations are changing our economies, our relationship to the environment, and our way of living together.

Only creative capacity, flexibility, and a certain audacity can generate the sustainable solutions we need to overcome today's challenges. We believe that the concept of "innovation" needs a more precise definition, the better to assume its central place among tools and action-oriented methods that will drive the post-2015 international development agenda.

To give concrete shape and definition to the concept of innovation, AFD, IDDRI and TERI called on their vast network of renowned experts and scholars from all four corners of the world. In this 2014 edition of *A Planet for Life*, these authors share their analyses, clarify various perspectives on innovation, and examine thirty years of experiments in sustainable development, drawn from all sectors of the economy. The authors describe experimental tools, institutions and models; however, such

inventions may not lend themselves to scaling-up and global dissemination. Our three organizations hold stakes in these experiments, draw on them, and share them on a daily basis with our partners – governments, enterprises, financial institutions, development agencies and research centers – who propose equally if not even more dynamic new models and adaptations in turn.

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We present this volume as part of our effort to think about and build tools for today and for the future, when development will take place in a more open and collaborative fashion. In these analyses, we hope that readers will find ideas to spark their own.

Damien Demailly,

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Innovation for sustainable development

Innovation has become the new buzzword across the globe. International organizations, governments, corporates, academia and civil society see it as the answer to major contemporary challenges. Societies and economies are under pressure from a set of profound changes: economic transformation such as globalization, new industrial geography, liberalization, commercialization and privatization; political transformation such as the rise of a multipolar world and loss of sovereignty of nation states; technological revolutions in informatics and biotechnology; and global environmental change. All these processes interact in complex ways and challenge the political, economic and social models of the 20th century.

Innovations are occurring and alternative solutions to the existing problems are emerging in all sectors. Electric cars, organic farming, renewable energy and e-learning are good examples. They are growing as major programmes, supported by governments and the private sector, often integrated into sustainable economic development plans. These alternatives are also seen as green initiatives, and are assigned virtues, such as being decentralized, frugal, flexible, smart and democratic, qualities that are lacking in conventional models. They are also attributed with the potential to meet the overall global challenges such as climate change and the growth of inequalities between and within countries. Innovations and alternatives are emerging not only in industrialized countries but also in developing countries. In fact, the latter have emerged as leaders in certain technologies, such as China in solar technology, and as pioneers in the development of revolutionary applications, such as mobile banking in Kenya.

These emerging innovations and alternatives raise five major issues: (1) Should the focus be on the technological dimension of innovation, including digital and green technologies? What is their real potential? Would their rapid deployment lead towards a more sustainable society? (2) What is the role of socio-economic and policy innovations in promoting and supporting sustainable development and interacting with the technological innovations? (3) Are the emerging alternatives more sustainable and do they replace the conventional models or merely interconnect and co-evolve with them? (4) What institutional changes are required to promote innovation for sustainable development? How can public policy drive change? (5) How should governments and corporates promote innovation and widen the geography of innovation?

A Planet for Life 2014 aims to explore innovation in all its aspects, through a series of texts written by international experts on innovation and its role in supporting sustainable development. The objective of these texts is to analyse experiences from across the world and the role of innovation in a variety of areas of development such as urbanization, agriculture and food, the mobility of people and freight, education and the provision of water and energy to all (Figure 1).

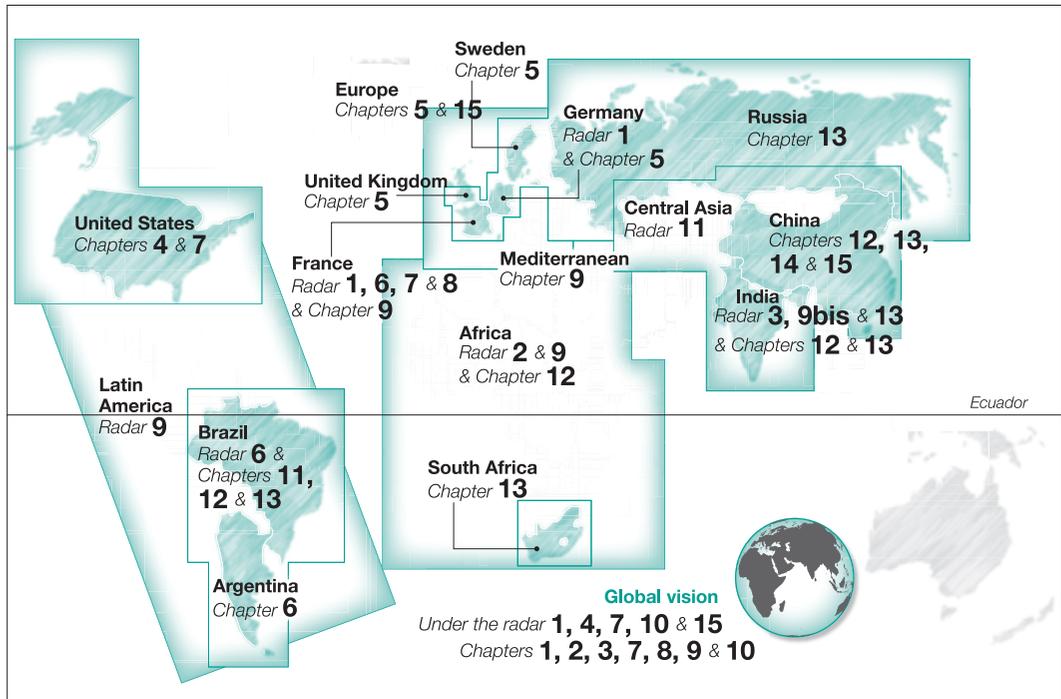
Can the promises of emerging technologies be realized?

The early chapters of *A Planet for Life* question the promises of new technologies: can ‘green tech’ usher in a new industrial revolution? Does digital technology create a more inclusive and environmentally-friendly society? The authors oscillate between optimism and pessimism, but seem to agree that innovation could either benefit or be detrimental to ecosystems and society. Whether the former or the latter outcome prevails will depend on how economic and social forces drive individual and collective choices.

Is technology the cause of or the solution to the world’s ecological and social problems? The historian **Grégory Quénet (Radar 4)** points out that in Europe and the United States, the ecological movement – whether intellectually, politically or charitably focused – has been buffeted since its beginnings by its love-hate relationship with technology. Beyond the ecological movement, all societies wonder if technology will save them from environmental threats. The philosopher **Alfred Nordmann (Chapter 4)** argues that society has renewed its faith in technological progress. Many who live in the industrialized world no longer see technology as a force for social progress, but as their last hope for solving environmental threats. According to Nordmann, even this hope implies a certain naivety about the technological and scientific promise of nanotechnology, life sciences and digital solutions. He underscores a particularly important message: we must not become ‘credulous believers’.

The authors in *A Planet for Life* try to avoid this problem of credulousness, as seen in the work of **Damien Demailly** and **Patrick Verley (Radar 1)**. Without denying the crucial need to develop new energy technologies, such as renewables, their

FIGURE 1 Countries and regions covered in this edition

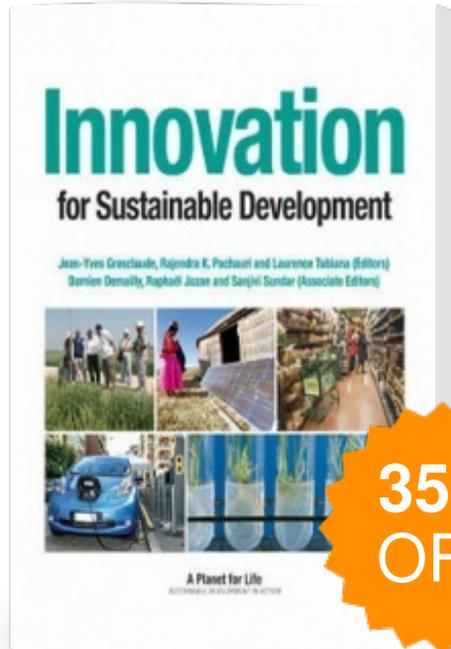


work questions whether such technologies can radically change our economies and generate growth equal to that driven by the steam engine or electricity. The earlier innovations fundamentally reorganized the economy, particularly by allowing factories to scale-up production. The authors note that so-called green technologies do not create similar opportunities for restructurings: green electrons remain electrons, green cars are still cars, and both rest on widespread twentieth-century technologies, electricity and the automobile.

Carlota Perez (Chapter 1) emphasizes the importance of the digital revolution now underway, because it goes beyond creating a few new industries. Taking a historical perspective, she views new information and communication technologies as powerful tools that can completely transform the economy and create what she calls a ‘new techno-economic paradigm’ compatible with green manufacturing and lifestyles. In sum, Carlota Perez argues that the world is ready for a new planetary Golden Age.

On the other hand, **Fabrice Flipo (Chapter 2)** underscores the material impact of these new technologies. He argues that computers, servers, devices and networks consume energy and require rare earths and toxic materials for their construction. Above all, they foster lifestyles and production systems that are far from immaterial. New uses, which are ‘lighter’ in terms of resource use, complement rather than

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