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Ecological Entrepreneurship

Maritta Koch-Weser

The world's environmental regimes, from local to global, have deep roots in "Ecological Entrepreneurship". To preserve a livable blue planet the world will need ever more of it.

This essay spotlights patterns, roots, and experiences that characterize a wide field of "Ecological Entrepreneurship" in which the author has shared in small part.

Causes

From the rainforests to the seas, people have wiped out biodiversity in the 20th century faster than any previous generations in the entire history of human kind. In the short time span of two to three generations a wide variety of environmental concerns have reached proportions that threaten local living conditions and overall global environmental stability.

Many species seem on their way to irreversible extinction. The list of plants and animals registered on the "Red List of Endangered Species" (published by IUCN's community of scientists) grows longer. Urban-industrial pollution, large scale land- and rainforest clearing, loss of top soil, massive diversion of grand rivers and bleaching of coral reefs all affect flora, fauna, and human environments. Planetary weather and climate conditions have begun to vary and change at grand scale. We see icebergs and glaciers melt. Ever more frequent, extremely dangerous and costly weather events with frightening high winds, floods, and droughts affect different regions of the globe, including major metropolitan centers, from New York to Sao Paulo. The environmental "footprint" of recent generations - associated with modern lifestyles and a world population that more than tripled in the course of one century - has left its mark.

Motivation

Ecological entrepreneurship is motivated by deep emotional, intellectual, and ethical appreciation of nature, and by a sense of urgency. Its gain is defined in terms of "sustainability" and environmental stewardship, to the benefit of present and future generations. It addresses many interrelated concerns. It has one ultimate purpose, but many facets.

Today's *ecological entrepreneurs* seek to achieve corrective and precautionary measures - soon enough to avert irreversible deterioration of living conditions on earth. They take a stance for environmental protection in connection with social and inter-generational justice.

They translate concerns into actionable solutions – strategies, policies, technologies, public debate, and business engagement. They engage in diverse niches where they can make a difference. In their respective spheres of influence – households, communities, organizations, industries, and government - *ecological entrepreneurs* contribute towards realizing larger goals in biodiversity conservation, pollution control, or climate change containment. They set out macro visions of “sustainability” and the need for reducing our “footprint”. They call for development of a “Green Economy” with “Intelligent Growth” that will no longer overstretch the limits of our one and only planetary home.

Irrespective of their cultural, religious, spiritual or agnostic backgrounds, *ecological entrepreneurs* actively engage in caring for nature and for recognizing the intrinsic non-economic value of all life of earth. Many bring to their self-appointed tasks remarkable personal drive – idealism and self-starter “power-of-one” leadership. They tend to be strategic, with tenacity, and a willingness to take risk.

Roles

Over the past 50 years *ecological entrepreneurship* has evolved. It has raised awareness, inspired frameworks for environmental stewardship and “mainstreaming” of ecologically sustainable approaches, in all sectors of the economy, with holistic consideration of product life cycles, and of public health.

To achieve specific goals, *ecological entrepreneurs* will deploy governance, technical, social, and communication tools - whatever it takes, “360 degrees”, in cross-disciplinary manner.

Ecological entrepreneurs take on a great variety of roles:

- **As inventors and pioneers of “green” technical, policy, and business solutions.** This has now become the fastest growing field with annual progress in the development of energy saving, smart environmental solutions. Early examples include the work of Amory Lovins, founder of the Colorado Rocky Mountains Institute; more than 25 years ago he began to prepare industry-specific guidebooks offering environment-friendly energy and material options. The German Wuppertal Institute worked along similar lines. Other

ecological entrepreneurs pioneered culturally adapted “parks & people” solutions that harmonized nature protection and local community needs. Others found ways to influence consumer awareness and attitudes. And others yet developed first Carbon Trading Exchanges, or tools for economic valuation of biodiversity (e.g. *The Economics of Ecosystems and Biodiversity (TEEB/UNEP)* program initiated by economist Pavan Sukhdev).

- **As communicators** *ecological entrepreneurs* make smart use of social web and media systems. Well aware that environmental goals can best be achieved with broad public support, they reach out to inform, educate, engage, and influence consumer attitudes (the German “Foodwatch” established by Thilo Bode serves as example). They articulate and network citizen demands. They rate and rank public election candidates in terms of their sustainability objectives and legislative track record.

They produce films that engage young people and broaden public understanding of issues. Some have been outstandingly effective, as their pictures and films reach so much further than words alone could. Examples range from the portrayal of nature’s beauty on the Discovery Channel to the “Uncomfortable Truth” climate change film sponsored by Al Gore in the USA a few years ago. More recently, they include Sebastião Salgado’s compelling GENESIS photography of creation - people, creatures, and lands in the remaining, most remote places on earth.

- **As “activists”** some, but certainly not all, *ecological entrepreneurs* will “go to battle”, often at personal risk. They give voice to underrepresented causes and provide wake-up calls: whipping-up internet signature campaigns (Avaaz, Campact), organizing street protests to rescue a threatened park or coral reef, or standing on a Greenpeace Boat. They may chain themselves to railroad tracks to stop nuclear waste transports in Germany. In Brazil the Instituto Socio-Ambiental (ISA) points fingers at large hydropower dam developments that interrupt natural systems and violate indigenous lands. *Ecological entrepreneurs* promote sustainable agriculture (like the Dutch Avalon Foundation), they fight deforestation (like the WWF, Friends of the Earth, and Conservation International), they oppose propagation of genetically modified organisms (like Save-Our-Seeds in Germany), or demonstrate against despicable systems of animal husbandry (like Saxony’s Green Party). They voice early warnings - against tar sand exploration that strip forest lands in

Canada, or fracking that poses threats to the safety of ground water and public health (like Bianca Jagger's Human Rights Foundation).

As activists, *ecological entrepreneurs* find themselves in the metaphoric role of David vs. Goliath – dwarfed by mighty public affairs budgets of companies or governments. Nevertheless, thanks to web-based media, thousands of civil society organizations and think-tanks are able to mobilize and give voice to citizens. The business community listens, aware of reputational risks.

Budgetary weakness can breed solidarity. *Ecological entrepreneurs* compete against each other for finance, but band together as needed, forming cause-specific activist alliances of highly structured, organized groups, organizations, networks and think-tanks. Teaming up they can marshal complex technical and legal competencies. They have developed patterns of collaboration that can in the course of a single day mobilize hundreds of thousands of cause related advocacy signatures – as has happened in recent months in protest against a project to build a coal harbor endangering the Australia's legendary Great Barrier Reef.

- **As watchdogs** *ecological entrepreneurs* engage in new fields of consumer protection and transparency. Since the 1980s, there has been worldwide progress in environmental legislation, and in international agreements on trans-boundary (e.g. large rivers) and global environmental safeguards – on biodiversity, climate, illegal trade in endangered species, in the designation of UNESCO World Heritage Sites, and many more.

Watchdog functions relate to adherence to such regulation. A sharp eye is cast for example on toxic waste disposal, illegal timber poaching, and ivory trade, and on corruption and fraud (for instance by Transparency International). And, as government administrations change, *ecological entrepreneurs* stand up against legislative changes that threaten to erode or roll back environmental standards (recent examples include attempted changes in water and air quality standards in the USA, and in Brazil's forest and indigenous rights legislation).

The exercise of non-governmental watchdog functions requires specialized (ideally *pro bono*) legal and technical expertise. Institutional responses include the Environmental Defense Fund (EDF), the Natural Resources Defense Council (NRDC), and "Client Earth", an association of lawyers offering *pro bono* legal assistance in the USA and Europe.

- **As science-based forecasters** *ecological entrepreneurs* address especially climate change and biodiversity loss. Rather than waiting for ultimate scientific proof, they promote the “precautionary principle”. Nicholas Stern convincingly argued in his famous 2007 analysis of the *Economics of Climate Change* that corrective action is needed ahead of both, ultimate proof and a point of no return. Klaus Töpfer, a former German environment minister and head of UNEP, stressed the importance of projecting outcomes of “business-as-usual” in order to induce timely foresight and changes of course.
- **As “inside transformers”** we find today’s *ecological entrepreneurs* in many, often less expected walks of life. From internal positions across all sectors of business, industry, and banking, and in international agencies and government they advance sustainability causes. Local and national parliamentary seats provide an excellent opportunity to *ecological entrepreneurs* to promote adoption of environment-friendly laws and incentives. Some highly engaged and effective *ecological entrepreneurs* are now found in the environment department or even the CEO’s chair of large companies, setting new standards, transforming value chains and product lines, and coalescing like-minded business leaders for climate action.

Ever since the Rio 1992 *Earth Summit*, a measure of “Corporate Social Responsibility” and environmental and social competitiveness has been introduced. For some companies, progress may not go much further than a glossy annual report. Increasingly, though, environmental and social excellence is better understood as truly more profitable business. The list of encouraging examples grows, as environmental and social certification systems replace simple-minded price competitiveness – for instance for timber, sustainable marine products, food and textiles. Experience and surveys show a growing consumer market, where a higher price is paid for “responsible” products.

Early Roots of “*Ecological Entrepreneurship*”

Environmental care has been a basic element in the evolution of human civilizations - in agriculture, regulated hunting and fishing. Awareness grew based on the concept of “sustainability” – famously first coined in Europe in the Saxony of the late 17th century. It recognizes intergenerational responsibilities in a world where environmental resources are not limitless.

By the late 17th century, mining had wrought unprecedented destruction of forests in Saxony's Freiberg region. Wood had been harvested for construction inside mines and smelters, and for housing and heating. Contemplating an increasingly denuded landscape, the head of the regional mining office, Bergrath Hans-Carl von Carlowitz, became the first to coin the concept of "Nachhaltigkeit" (sustainability). Deeply concerned with unsustainable patterns of development, he promoted forest management and systematic afforestation. He pioneered and epitomized early *ecological entrepreneurship* – taking proactive steps to change an untenable situation, writing a forestry guide, and laying foundations for the world's first Forestry School in Tharandt, which continues to function to this day as a part of Dresden University.

Soon, first signs of *ecological entrepreneurship* came up in the Americas, for instance in Brazil. In the second half of the 19th century, forests around Rio de Janeiro had been cleared excessively for timber, coffee, and sugar cane plantations. As a result water sources for the city began to dry up noticeably. In 1862, with remarkable environmental foresight, Brazil's Emperor Dom Pedro II ordered the replanting of the Floresta da Tijuca forests above Rio de Janeiro.

There had been precursors: Rio de Janeiro's magnificent Botanical Gardens had been created already in 1808, and all along the 19th century natural scientists and explorers – key *ecological entrepreneurs* of their times - travelled to the far ends of Amazonia and along Brazil's coastal forests, mapping and registering for the first time the flora and fauna of these parts of the New World. The famous Austrian-German expedition of Johann Baptiste von Spix and his colleague Carl von Martius was invited in 1817 to describe Brazil's flora and fauna. They covered thousands of miles, making their splendid original drawings of plants that can now be seen at the recently opened "Brasiliana" Mindlin Library at Sao Paulo University.

The 20th Century

In the late 1940s, in the wake of the terrible First and Second World Wars, and of the horrific first deployment of atom bombs over Japan, *ecological entrepreneurship* developed sharper contours. Humans had delivered proof of novel, vast destructive abilities, potentially powerful enough to change all life on earth.

With an unprecedented world population growth rate, global resources ceased to appear limitless to men. The apprehension that an exponentially growing world population might become unable to feed itself was first and famously set out in the

1972 Club of Rome report on “Limits to Growth”. Fundamental concern with our planet’s “carrying capacity” has never gone away, in spite of impressive advances in agriculture, which have enabled countries like India to feed a doubling population, and even to export food. Recently food security debates have gained new life as climate variations affect agriculture.

Modern day “sustainability” concepts have evolved since the late 1940s, which saw the beginnings of a very first worldwide environmental protection movement. In a predominantly still rural mid-20th century world, environmental organizations idealized peace and pristine, grand natural environments, from the Alps to large-mammal habitats in Africa’s Serengeti and in Asia. Foundations were laid then for larger, transnational systems of solidarity and good governance for nature, for instance by the Swiss Pro Natura organization and, internationally, by UNESCO (founded in 1945), and IUCN – the International Union for the Conservation of Nature (founded in 1948). Concepts were integrated and authoritatively summed up for the global community in the 1987 Brundtland report on “Our Common Future”.

The second half of the 20th century became an era for mega-infrastructure development, large enough to be visible from outer space, transforming the face of the earth. It saw construction of huge hydropower and irrigation dams, for instance in South Asia and Egypt. Highways and new settlements cut into remote frontier areas in South America and Indonesia. The largest mines were developed, from Carajas in Brazil to Australia and Papua New Guinea. New technologies and heavy machinery enabled land occupation and deforestation at massive scale in public resettlement schemes in Southeast Asia and Amazonia, where they were paid for in good part by the proceeds from harvesting high value tropical timber. With huge, increasingly “vertical” urban development, dozens of sprawling mega-cities developed in Asia and the Americas, and gas-and oil pipelines came to cut across all continents at the apex of the petroleum age.

Also in the 1980ies, very much thanks to *ecological entrepreneurship*, attention turned to the enormous challenges in urban-industrial development - environmental safety, air quality, clean water supply, waste disposal, and climate and energy issues. Most of these themes were picked up by standard setting organizations established since World War II – ISO (International Standards Organization), WHO (World Health Organization), by national regulation, and in the United Nations protocols and framework agreements of the 1990ies. The 20th century became an era of revolutionary technical invention. As it came to a close, an alternative green path for

renewable energy generation, emissions reduction, material efficiency, and new transport and housing systems had been laid open.

Ecological Entrepreneurship – the United Nations way

Thanks especially to Maurice Strong, a business entrepreneur turned *ecological entrepreneur*, the United Nations in the late 1960s had begun to pick up worldwide signals of environmental stress. In 1971, Strong commissioned a report on the state of the planet - *Only One Earth: The Care and Maintenance of a Small Planet*, a book co-authored by Barbara Ward and René Dubos. The report summarized the findings of 152 leading experts from 58 countries in preparation for the first UN meeting on the environment, the 1972 United Nations Stockholm Conference on the Human Environment.

This Conference became a turning point. “Environment” came into its own as an academic and governance field. UNEP, the United Nations Environment Programme, was launched, and followed by successful initiatives, such as the 1987 Montreal Protocol, designed to reign in ozone depletion. Most significantly, 20 years after the Stockholm Conference a second global United Nations’ summit - the 1992 “*Earth Summit*” - was convened Rio de Janeiro. It became the apex of Maurice Strong’s success, and was attended by many heads-of-State.

Like no other, Maurice Strong came to impersonate global *ecological entrepreneurship* as a key mover, making history from Stockholm 1972 to the Rio+20 UN Summit in 2012, forty years later. The Rio 1992 *Earth Summit* had produced lasting results, among them the International Convention for the Protection of Biodiversity (CBD), groundwork for the 1997 “Kyoto Protocol” (the United Nations Framework Convention on Climate Change (UNFCCC)), and “*Agenda 21*”. The *Earth Summit* also saw early “environmental economics”, among others in connection with the World Bank Annual Report on “*Environment and Development*” (in which I participated as social scientist). Among others it put numbers on the cost of wrongheaded subsidies (e.g. perverse incentives associated with energy policies), and of health hazards from indoor pollution among the world’s poorest women and children. It was authored by Andrew Steer, who was to become another life-long *ecological entrepreneur* (he now heads the World Resources Institute in Washington DC).

The *Earth Summit* included new groups of *ecological entrepreneurs*. It included NGOs – civil society organizations which had hitherto been sidelined by public programs as uncomfortable antagonists. And it included the business community. Under the

leadership of Stephan Schmidheiny, a Swiss entrepreneur, the World Business Council on Sustainable Development (WBCSD) was launched, which has since remained an international network that inter-connects and seeks to improve environmental standards for key industries. In similar spirit, the United Nations later established the Global Compact under the leadership of Kofi Annan. Later yet, as these lines are written, the launch of a major United Nations Green Climate Fund is underway.

In spite of all current struggles for a continued and stronger global climate agenda, the United Nations deserve huge credit for their *ecological entrepreneurship* over the past four decades. They have given the world a forum for global environmental governance.

“Sustainability” Mainstream

By the late 1990ies “sustainability” had turned into a commonly accepted, almost platitudinous goal – along with a new culture of “bio” and “eco” lifestyles and “green” consumer demands. “Environment” had turned into a sector: environment ministries or – agencies, policies and legislation had been developed. In the process vast new spaces for *ecological entrepreneurship* opened up.

There was now an active demand for the environmental expertise and leadership needed to effectively implement new environmental rules. There were also new spaces for “activists” who contended that newly created environmental institutions remained exceedingly marginal – left high and dry, lacking political clout and budgets. Activists also cast their eyes on “fig leaf” environmentalism - businesses that had publicly adopted sustainability goals in their public affairs offices, but failed to change their business in substance.

On the political stage their alerts mattered. From my World Bank office on Pennsylvania Avenue, close to Washington’s White House, I could see huge banners going up across the street, poignantly reminding our World Bank management of indigenous and environmental safeguards they had signed. These protests were the work of Washington based *environmental entrepreneurs*, amongst them Barbara Bramble (The Nature Conservancy), and Bruce Rich and Steve Schwartzmann (Environmental Defense Fund), who for years marshalled the attention of US Senators Heinz, Gore, and Wirth.

Other new drivers followed, among them organizations for voluntary sustainability reporting (e.g. the GRI-The Global Reporting Initiative, or the Carbon Disclosure Project), and for certification systems (e.g. FSC for timber). *Global Footprint* initiatives

began to size up the excessive use of environmental resources to the detriment of future generations, and various organizations took on the defense of interests of unborn generations, and climate justice.

Ever since the *Earth Summit*, the search for common moral, ethical denominators in our multi-cultural, multi-religious world had continued. Special mention must be made of the year 2000 Earth Charter. It is a declaration of fundamental ethical principles for building a just, sustainable, and peaceful global society in the 21st century. It is the product of a decade-long, worldwide, cross-cultural dialogue on common goals and shared values. The Earth Charter project began as a United Nations initiative, and was carried forward by a global civil society initiative.

Ecological entrepreneurship became instrumental in fighting for the designation-in-perpetuity of Protected Areas, Biological Corridors, and Indigenous Reserves. Setting aside vast tracts of land was and remains contentious, with many rivaling claims. Successes were wrought over 3-4 decades in dialogue and give-and-take among conservationists, local communities, and landowners.

If today protected areas make up more than 11% of the world's land surface, this is in large part due to the leadership of a handful of most stubborn early *ecological entrepreneurs* and skilled negotiators, who have achieved a lion share of global conservation "conquests" – among them Paulo Nogueira Neto and Jose Pedro de Oliveira Costa in Brazil, Martin Hildebrandt in Colombia, Thomas Lovejoy and Russell Mittermaier in the USA, and countless other engaged individuals and conservation lobbies around the world. Much remains to be done. Struggles continue into our 21st century to complete key protection systems for terrestrial and marine biodiversity.

Formative experiences "in the witness stand"

Changes did not come about easily in the 1980s. Environmental regulation was commonly still perceived as holding back progress. Famous words included the "you can't make an omelet without breaking eggs" quote, used among others in reference to the flooding of lands for large dams. At the World Bank, where I had begun work as one of the first anthropologists, tensions in the "environment- versus- development" debate produced a generation of memorable, fine intellectuals and great fighters among my colleagues: Robert Goodland, Michael Cernea, and Shelton Davis made seminal contributions, as did their counterparts around the world.

Difficult experiences in the Amazon during my early professional career in the 1980s put me on the path of *ecological entrepreneurship*. Back then, I witnessed highly

problematic outcomes of some World Bank financed programs which – very much in contrast to their well-conceived design and proper loan agreements – got out of control. They could not stem massive deforestation in pristine rainforest regions, and saw tremendous human hardship in unhealthy and ecologically unsustainable land settlements.

Key lessons came from the POLONOROESTE program in the northwestern Amazonian frontier state of Rondonia. Brazil's local and federal Government agencies failed to stick to the carefully crafted environmental and social safeguards to which they had committed under World Bank Loans. Signed agreements largely remained dead letter. There was a blatant lack of political will, but also a severe lack of institutional preparedness: environmental agencies and the forest police were not yet equipped to exercise effective controls. Official agreements for long term sustainable development – based on agro-ecological zoning - were easily undercut by well financed, short-term timber and settlement interests, and in all likelihood further accelerated by bribes.

Adrian Cowell, an outstanding British filmmaker and *ecological entrepreneur* in his own right, documented the process and brought it to world attention in his BBC documentary series "The Decade of Destruction". In defense of environmental and indigenous safeguards we engaged in a tug-of-war that was to last many years, and which ultimately – on the upside - led to strong, nationwide environmental institution-building programs.

In the Brazil of the 1980s, I also witnessed the detrimental environmental impact of opposing and contradictory government interventions in the vast Carajas region of eastern Amazonia. Along the 800 km railroad which led from the world's largest iron ore mine, Carajas, to the port city of Sao Luis do Maranhão environmental safeguards for indigenous and environmental agreed to by the government owned CVRD company (Companhia Vale do Rio Doce) were duly implemented under the leadership of the committed Maria de Lourdes Davies Freitas, who headed CVRD's environment operations. However, subsequently, achievements were undercut by a separate Government program which pursued squarely opposing objectives: the so-called Greater Carajas Program promoted charcoal-based domestic pig iron production, which in turn led to the transformation of vast pre-Amazonian forests into charcoal for local pig-iron smelters.

All over the planet, there was in the 1980s and 1990s an acceleration of ever more rapid land clearing, dredging, mining, urban and industrial development – aided by powerful, transformative agricultural and construction equipment. It often remained

hard to get *timely* attention for looming environmental challenges. For example, I vividly recall advertising a first film-screening on the tragic, at the time little known ecological disaster of the Aral Sea: during Soviet Union times rivers had been diverted to feed large scale agricultural irrigation schemes. By 1990 our film documented that the drying Aral Sea had already split into two parts. Former fishing boats rusted away on dried up lands, and winds had carried salt from the dried up sea bed onto adjoining lands, turning them useless to agriculture and people. We had expected a sizable audience, but remained alone at the lunch time film-screening: the movie producer, one guest, and I. The shrinking of the Aral Sea remains a most tragic ecological legacy. Help came too late.

The Upside

With experiences such as these, *ecological entrepreneurs* learned to grow better, more timely and foresighted programs. Environmental progress came about piecemeal, on many diverse, seemingly unspectacular fronts. We assembled pieces of a complex puzzle, patiently, with intermediate, manageable goals. Out of different institutional settings I shared in some of those milestone examples. At least for a while they made our group of colleagues proud, albeit always *en route* to next challenges:

- **We were proud of conservation and protection “results-on-the ground”.** As you look at the map of Brazil today you will see a system of nature conservation areas and indigenous reserves which did not exist on any map of the 1970s. Most were developed in the context of Government programs, from the 1980s onwards, in which our group of colleagues had the privilege to participate on behalf of the World Bank. Satellite images confirm that to this day designated conservation and indigenous areas have mostly remained intact. This has been an important, if partial, victory of dedicated Brazilian anthropologists and environmentalist – Betty Mindlin, Mauro Leonel, Carmen Junqueira, Apoena Meirelles and other FUNAI (Indian Agency) staff, Beto Ricardo, and many more. By now, some 20% of Brazil’s Amazonia have been designated as indigenous reserves, in addition to Brazil’s protected areas system (ARPA).
- Equally, we were deeply committed to drafting (and later periodically fine-tuning) first **Social and Indigenous Safeguard Guidelines** which served the World Bank and country governments borrowing from it. In the 1980s our pioneering group of sociologists and anthropologists at the World Bank

modelled indigenous peoples and resettlement guidelines, which emphasized the rights of people affected by large infrastructure projects, obliging careful pre-project analysis, and improvements of livelihoods beyond mere substitution.

While any resettlement is best avoided, this new framework was a major improvement over cases I had witnessed in rural resettlement in Brazil and Bolivia in the late 1970s. Back then, along the newly built *Transamazon* Highway, resettlement projects had brought landless people from Northeast Brazil as farmers into completely different, unknown Amazonian environments near Altamira. Similarly, in 1977 in Bolivia, I visited as a young consultant the US AID supported San Julian rural resettlement areas north of Santa Cruz de la Sierra, where visibly disoriented highland Aymara indios had been brought onto tropical forest lands as farmer-settlers, wearing their traditional warm highland woolen caps in the sweltering heat of an unfamiliar lowland environment.

Another example I witnessed already during my student days involved forced resettlements of urban “favela” slum populations in the early 1970s. Reflecting a lack of socio-cultural planning, members of Afro-Brazilian cult centers in Rio de Janeiro (at the time the focus of my PhD field research) had been transferred to standardized, newly constructed social housing. Lacking their favela backyards, they kept live animals - goats, chicken, and doves intended as sacrifice at upcoming Afro-Brazilian rituals – in their new third floor bathrooms.

In all cases, and probably at no additional cost, more careful socio-cultural planning could have increased resettlement success rates. Our guidelines were designed to do better.

- Our new World Bank **Environmental Impact Assessment guidelines** ultimately changed and significantly improved project designs. They obliged systematic scrutiny, and opened up dialogues with national project development teams and their agencies. And they stressed listening to affected people and communities.

In turn, the existence of mandatory guidelines triggered market demand for social and environmental expertise. Specialists were hired into agencies and consulting companies. Our numbers of social and environmental experts at the World Bank grew from a handful in the late 1970s to several hundred in the

1990s. Environmental and social experts were employed in project design and field level monitoring and evaluation to accompany the ways in which safeguards were carried through over the lifetime of projects.

- **Other “milestones” involved the onset of international development lending for environmental programs.** At the World Bank as well as at regional Development Banks financing for nature protection and safeguards of indigenous rights would have been unthinkable before the early 1980s. Until then, infrastructure development had been the principal object of international development finance, and narrow cost-benefit and repayment criteria were applied.

Once the financing for environmental project components was approved (albeit initially only for some “do no harm” safeguards), this became a turning point. The measuring stick for development finance had begun to change. Rather than evaluating profitability narrowly on a market and project basis, safeguarding national ecological heritage came to be recognized as a sound, foresighted national investment in its own right.

The work on financing pro-environment project components sharpened policy analysis. For example, funding environmental protection in Amazonia made little sense as long as national fiscal incentives still favored forest clearing as the economically appropriate land use, for which tax breaks were made available. I felt fortunate to be associated with the analytical inroads made by economist colleagues like Dennis Mahar and Hans Binswanger, who uncovered major forest policy related inconsistencies in Brazil. Subsequently the World Bank’s 1992 “Environment and Development” report more broadly paved the way for an international environmental economics discipline.

- **“Freestanding” environmental loans for National Environmental Programs** began to be developed from the late 1980s onwards. This was another step up, another “victory” wrought by twofold lobbies: on the one hand local environmentalists in Brazil, Mexico, and the Philippines, and on the other hand *ecological entrepreneurs* at the World Bank who succeeded in convincing senior management and the Board that time had come for financing environmental institution-building. National Environmental Programs were pioneered in Latin America. Urban environmental projects took off soon thereafter for megacities and industrial “clean technologies” across Asia. In

addition, the Montreal Protocol funded programs to phase out ozone depleting substances.

- **Acceptance of the principle of global burden sharing in biodiversity conservation. The Global Environment Facility (GEF)** became another step ahead. Principal donor governments agreed in the late 1980s to share some of the financial burden for protecting global biodiversity and for reducing CO₂ emissions in low and middle income countries. The GEF was established as a grant finance window shared by the World Bank, UNDP, and UNEP. GEF funds went mostly to governmental programs; however, for the first time, NGO-led programs also gained access – supporting their *ecological entrepreneurship*. In spite of its complex governance, the GEF has retained a key role in global biodiversity conservation funding.
- **From the late 1980s onwards, there seemed to be no limit for creativity in environmental finance.** Among others, Innovations included debt for nature swaps, and many novel public-private partnerships. In addition to implementing the GEF, our World Bank teams were able to cooperate with bilateral donors achieving longer term, multi-donor collaborative environmental programs. A prominent example is the 1992 “Pilot Program for the Protection of Tropical Rainforests in the Brazilian Amazon and the Atlantic Forest” (PPG7), launched with Germany in the lead, which for many years remained Brazil’s largest ever environment program.

In the course of the 1990ies, World Bank financing became possible for a further, widening range of environmental themes – among them a first generation of Alternative Energy projects, project finance for World Heritage Conservation, Natural Disaster Preparedness programs, and a specialized Carbon Fund. When I left the World Bank in 1999, there was a sizable, consolidated portfolio, with lending of about 1 Billion US\$/year for environment.

Systemic Improvements

Ecological entrepreneurship comes with constant learning and adjustment. As first generations of environmental programs were funded, the need for various systemic improvements became obvious.

Three examples – where first improvements have been achieved (and more may be needed):

Example 1: the need to adapt traditional finance mechanisms to specific needs of the environment sector. In contrast to large investment projects in other sectors, protecting nature typically will require just-in-time responsive, small, quick, and versatile lines of funding. In the face of environmental threats, lengthy project preparation periods (the norm under other World Bank lending) seemed to defeat the purpose of timely intervention.

Therefore the search was on in the mid-1990s, for adaptable, performance-based lending instruments, that could adjust to trial and error programs, and take due account of results from community consultation and participation. In metaphoric language, we were looking for quick and smart rabbit-like lending, rather than huge, more static elephantine loans.

Against this background we successfully ran a World Bank internal campaign in the 1990s, advocating “*Adaptable Program Lending*” and “*Learning and Innovation Loans*”. Their approval by the Board meant a lot for nurturing local, community based initiatives.

Example 2: the need to generate additional grant funding to secure nature protection programs. With the establishment of so many (almost always threatened) new conservation areas on earth, the overall pool of funds available to civil society organizations for environmental protection must be enlarged.

At the outset of the 21st century a first model seemed to exist. The Dutch Post Code Charity Lottery was already raising hundreds of millions of Dollars every single year. Had their system been copied at comparable levels of participation in all countries across today’s European Union, many problems in funding nature protection would have gone away already. This is the cause fought for by ACLEU, the Association for Charity Lotteries in the European Union. A few years ago, ACLEU calculated that funds of up to 8 Billion Euros might be raised annually through charity lotteries in the European Union.

Since founding Earth3000 in 2001, I have continued to participate in the search for innovative financing mechanisms. During my years at the helm of the Global Exchange for Social Investment (GEXSI) (an early “impact investment” initiative launched by the Davos World Economic Forum in 2002), we turned to the *potential for micro-donations*. With modern accounting software at wholesale and retail stores

and large automated billing systems of utility and telephone companies, there now exists – thanks to modern accounting software - potential to raise billions of cents by “rounding-up” bills. Bills could be rounded-up at retail cashiers or on utility bills to the next ten cents, or even to the next Dollar, Pound or Euro. New accounting software made “clean” accounting for millions of cent-size donations possible.

The question became whether businesses and the general public could be inspired to turn “rounding-up” into a middle-class micro-donations habit, large enough to make a significant difference in aggregate. From 2004 onwards, my colleagues Albrecht von Hardenberg, Christine Purdy, and I gave speeches at social entrepreneurship conventions, advocating round-up schemes. Names changed as we described new opportunities - from “Painless Giving”, to “Change” and “Round-it-up”. Increasingly we found open ears among a wider social entrepreneurship, philanthropy, and business community.

“Rounding-up” has since been introduced in several countries, always after careful technical, legal, and outreach preparation, and designed to achieve maximum transparency and efficiency. In Germany it has been launched as “Deutschland-Rundet-auf” under the leadership of Christian Vater, and in Brazil as “Arredondar” under the leadership of Ari Weinfeld. Similar programs exist in Israel, in the USA, and elsewhere.

Example 3: the need for science-based economic development of the “sui generis” potential of earth’s remaining rainforests. Time has come to develop a new kind of “economic protection” for remaining tropical forest lands, to counter continuing massive deforestation in South-and Central America, the Congo Basin, and South East Asia. Globally, the burning of forests still contributes some 12-17% of annual worldwide CO2 emissions. It causes irreversible losses of biodiversity and upsets regional water balances. Stopping the mindless destruction of public and private forests outside designated nature protection reserves would make a major contribution towards the world’s climate, biodiversity conservation, and water agendas.

How could standing, sustainably used forests become profitable at “competitive” levels – able to match returns from land-clearing-based crops like oil palm, soy beans, and cattle? Clearly, ambitious investment will be needed in basic and applied science, product and market development, and in training Rainforest Business specialists.

Development of a first specialized Rainforest Business School system has started recently. At the Institute of Advanced Studies of Sao Paulo University we begin to develop a collaborative program and a curriculum focused on development of the *sui generis* economic potential of tropical rainforests (fruits, plants, fibers, tubers, timber, fish), and on related new products and markets – all to train a new generation of rainforest business experts.

No End to Challenge

Many inroads have been made by our generation of social and *ecological entrepreneurs*. Nevertheless there have been few occasions for outright celebrations of any “lasting victories”. More often than not, progress was real yet insufficient to fully overcome fast growing environmental challenges. Every time we reached a milestone goal, new gaps or new policy hurdles appeared.

Ours has been a constant race, marking progress on a chart with two divergent curves: a gently rising, encouraging curve of more effective environmental management and finance, and a far more steeply rising curve of environmental deterioration, pollution, and climate changing emissions – especially, in more recently industrialized, rapidly urbanizing countries in Asia and Latin America.

An Era of Ecological *Business Entrepreneurship*

En route to a “Green Economy”, *ecological business entrepreneurship* now moves center stage. It takes new kinds of *environmental entrepreneurship* to increase the speed of uptake of environment friendly technical, social and economic innovations. Every year new ideas and new products are developed. They must gain more momentum. It still takes too many years to achieve market entry, too many years to build new companies, and too many years before new, updated green technology curricula are offered at engineering, architectural, and professionalizing schools.

Ecological entrepreneurship deals with technical challenges and business opportunities. It relates to the environmental efficiency of housing, to material efficiency, to “clean technology” industrial production, and water and waste management in an urbanized world. It relates to the ways in which we organize transport, and efficiently use and sustainably generate energy. And it relates to the ways in which we feed ourselves with due attention to soil, water, and genetic resources, and avoidance of toxic contamination.

We have entered a science- knowledge- and business-based stage in *ecological entrepreneurship*. Past institutional and attitudinal achievements in the environment

field need to be matched by products and markets for a greener planet, for more climate care, and for healthier living conditions, with safe water and cleaner air. Combining a sense of urgency and business acumen, ecological entrepreneurs can continue to make a difference.

The author has witnessed the emergence of *socio-ecological entrepreneurship* since the mid-1970s. She participated in the design of environmental programs out of varying institutional settings – public and non-governmental. Most formative were 20 years as social scientist and environmentalist at the World Bank, with innovative policy, project, and management contributions. In later years she became Director General of IUCN, the largest international umbrella organization of scientific, non-governmental, and national public environmental organizations. In 2001 she founded Earth3000, a non-governmental organization supporting innovations in governance for environment and development. She maintains a role on private sector and civil-society boards, and in academia in Germany (Dresden International University), Brazil (Institute for Advanced Studies, Sao Paulo University), and the USA (as a Global Fellow of the Woodrow Wilson Center).