Urban Eco-Efficiency Lab

Workshop report

22. 10. 2012. China National Convention Centre, Beijing

World Resources Forum 2012
This workshop took place as part of the World Resources Forum 2012, which was organized by Chinese Academy of Sciences/Institute for Process Engineering (CAS/IPE) and WRF Secretariat, in Beijing, 21-23 October, 2012.

It was organized by the World Resources Forum, a global science-based platform for sharing knowledge about the economic, political, social and environmental implications of global resource use, and supported by Secretariat of the Convention on Biological Diversity (SCBD), an interdisciplinary research and services institution for the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

This report drafted by Veronika Rékasi, based upon inputs of speakers and participants. The summaries of individual presentations have not been reviewed by the speakers.

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The Urban Eco-Efficiency Lab was part of the World Resources Forum conference which took place in the China National Convention Centre, Beijing from 21-23 October 2012. The workshop was organized by the Secretariat of the WRF. The Lab was pointing on ecological solutions for sustainable cities, ICT solutions for greater efficient urban life and on buildings that can be built much faster, easier and with renewable materials. The key findings of the workshop were presented by Rui Zhang, Project Associate of the World Resources Forum at the Panel discussion on the last day of the Forum:

• Using just the technology we already have (public transportation, bicycles, electric cars, natural cleaners) we can reduce our footprint and the loss of biodiversity.

• ICT has the potential to cut global carbon emissions by as much as 15% and save up to 600 billion euro.

• Nations should learn from each other and share best practices

• The challenge posed on Earth by the fast increasing population can be solved by “growing to the sky”, but considering the resources we use.

• Future cities should meet the following criteria: Minimal consumption of resources, energy efficient, economical, fast, adequate space on a small footprint

• Cooperation between organizations is needed in order to achieve better results in recycling e-waste.

• City governments can do most for implement new and sustainable methods
Beijing, 22 October 2012. The World Resources Forum in 2012 took place in the China National Convention Centre, Beijing from 21-23 October. Part of the conference was the Urban Eco-Efficiency Lab organized by the Secretariat of the WRF. The Lab was pointing on ecological solutions for sustainable cities, ICT solutions for greater efficient urban life and on buildings that can be built much faster, easier and with renewable materials.

The moderator of the workshop, Dr Xaver Edelmann opened the event at 8:30 am with a short retrospection of the week before. The World Resources Forum was also present at the conference COP11 in Hyderabad, India, with a side-event organized on the same topic. The Urban Eco-Efficiency Lab in India was a great success, with a lot of participants and very promising ideas and initiatives. That was the first step of a joint-project directed by WRF and the Secretariat of Convention on Biological Diversity in the field of sustainable and bio-diverse cities. Dr. Edelmann delivered the apologies of Mr. Oliver Hillel, Program Officer of the Secretariat of CBD, who unfortunately could not join the workshop this time.

After this short preface, he welcomed the participants, highlighting the Student Reporters presence and introduced the speakers:

- Rui Zhang, Program Associate, World Resources Forum - Presenting the WRF Background Paper
- Luis Neves, Climate Change and Sustainability Officer, Deutsche Telekom AG, - ICT Enabling Energy-efficient and Sustainable Cities
- Stephan Wabnegger, CEO of Cree GmbH, Austria – The Natural Change in Urban Architecture
- Sibylle Rock, WW Stakeholder Engagement Manager, Hewlett-Packard, USA - Simple City: The Impact of ICT.

Dr Edelmann anticipated that we need practical solutions and actions, not just theoretical papers. We need concrete and standardized indexes in order to make sustainability measureable, and we have to strengthen the cooperation between initiatives. He recommended reading the booklet on Cities and Biodiversity Outlook to get a clear picture about the situation of the urbanized areas.
Rui Zhang presented the WRF Background paper, highlighting the advantages of the intelligent use of ecosystems. At city level, eco-efficiency can be particularly useful for integrated planning, because city is a multi-sectoral, multi-stakeholder system and its ecosystem is a common asset to all. To dispose of waste, purify freshwater, clean up pollution, reduce energy needs through temperature regulation in heat islands, and maintain its citizen’s health, cities need ecosystems services and biodiversity. A network of parks increases surrounding property values by up to 20% and creates local jobs; green parkways generate businesses as urbanites look for cleaner air. Using just the technology we already have (public transportation, bicycles, electric cars, natural cleaners) we can reduce our footprint and the loss of biodiversity.

Luis Neves started with the vision of GeSi: “responsible ICT creates sustainable world”. This should become real as soon as possible. At the moment, if all the inhabitants of the Earth would live like an average-European, we would use the resources of 3 Earths. If they lived like an average American, we would use the resources of 5 Earths. If we look back at the history of humanity, we can see many civilisations that collapsed after a few centuries of prosperity. We are going in the same direction: building a huge population without considering the impacts on nature. ICT is very important in reducing our footprint, although the discussion on its positive impact is very rare in organizations. But ICT is the future, it has transformed the world, videoconference and laptop were just dreams 20-30 years ago and now they are real. If we consider for example a China-Germany flight, it has a large pollution, instead we could use videoconference to do the same, and it would be much more sustainable, we would save a notable amount of resources. By 2020 Carbon emissions of the ICT sector will represent an estimated 3% of total global emissions; in the same time ICT has the potential to cut global carbon emissions by as much as 15% and save up to 600 billion euro. Just to mention a good example, teleworking could reduce the carbon emissions by millions of tons. Smart motors, smart logistics and smart buildings are all assets to reduce our environmental impact and to live a better organized, simpler, greener life. Nations should learn from each other, smart buildings have the highest efficiency in the USA, transportation is the best organized and most effective in Europe, while energy production and use is the best managed in India. In his closing Mr Neves asked the audience to look at all the potentials provided by ICT, because humanity has already everything to live a better and more sustainable life. We just have to use them.
Xaver Edelmann noted that in 2009, parallel to the World Resources Forum in Davos a similar event was held in Nagoya, Japan. The two congress sites were connected via teleconferencing technology, so the WRF Davos and the WRF Nagoya had common plenary sessions and technology enabled the remote participation.

**Stephan Wabnegger** explained the architectural side of urban efficiency. His key question is “How will we live tomorrow?” We will face 3 billion new members of middle class society. Actually these are good news, because it means reduced poverty, but on the other hand these people need more resources. How to face this? Mr Wabnegger showed us one way to solve this problem: growing to the sky. Growing to the sky, but considering the resources we use. To produce a very light object, we use multiple times more resources from the Earth. For example to produce a 0.3 kg mobile phone we use 500 kg of our resources. The production of a 5 kg computer consumes 1500 kg of materials. In this light, how should we build our cities? They should meet the following requirements: Minimal consumption of resources, energy efficient, economical, fast, adequate space on a small footprint.

CREE GmbH decided to use wood for their buildings, because wood is renewable and it is CO2 neutral. In the production of 1 m³ of cement building material 1.700 kg CO2 is emitted. If we are talking about steel, then this rate is around 6.800 kg CO2. In case of wood, the CO2 emission is - 960 kg. This means not just CO2 neutral, but CO2 consuming as well. In addition each building item is designed for being recycled at the end of its life. This hybrid-timber prefabricated construction system developed by CREE allows building up to 30-story houses. This all sounds spectacular, but what about the fire protection? Actually this hybrid-timber is more resistant to fire than steel. This great practice works fine in Austria, but it has difficulties in other countries. Unfortunately the local law cannot be standardized, and all the standardized building blocks have to be changed from country to country. The participants were interested in where could be the market of wood buildings extended? They agreed that in China this method could be implemented with great success, as a lot of raw-materials can be found and the building sector is emerging. Japan arose as well as a possible market, because in Japan wooden houses are very popular.

Another question from the audience referred to whether the CREE is targeting developing or developed countries for its market? Mr Wabnegger said that these buildings are generally as expensive as normal ones in developed countries. Clearly the idea would be to transport the technology to developing countries.

**Sibylle Rock** presented the efforts of Hewlett-Packard to build a more sustainable future. HP’s strong commitment to environmental sustainability can be recognized from all the green rankings and awards it has earned. ICT companies have a big responsibility
in solving environmental challenges. HP is taking huge efforts to follow up its products life-cycle. Partnering with its suppliers, nongovernmental organizations (NGOs), and other industry leaders, HP can promote sustainability at every stage of the IT supply chain. HP provides Asset Recovery services, where customers can return their products at the end-of-life. A question arose from one of the participants whether this recovery service covers just HP products or products from other brands as well. In China, it is a huge problem dealing with all the smart phone copies circulating on the market, and being thrown away after some months of use. ICT companies are taking efforts in order to get back more products after use. Recycling and recovering a certain percentages of the sold products is regulated by law in the European Union. Mr Neves mentioned the importance of the cooperation between organizations in order to achieve better results in recycling e-waste. Ms Rock described the main idea of two impressive HP inventions: The HP Pod 240a - nicknamed as the HP Eco POD – a modular datacentre, deployed in Georgia, Texas. Each HP Eco POD offers the equivalent of nearly 9,000 square feet of traditional data centre IT in a 900-square-foot package and in the same time uses 95% less facilities energy when compared with traditional data centres. The other invention is called Energy Sustainability Systems (ESM) software, which analyses, monitors and optimizes energy consumption and carbon emissions. It provides solutions on integrated management and reporting of financial and sustainability key performance indicators. Using this software we could save up to 10% of the city’s costs. Ms Rock claims: “ICT is a key enabler to improve the quality of urban life while reducing the CO2 emissions in times of global urbanization.”

At the end of Ms Rock’s presentation, she announced the brand new project of HP in Intelligent mobility. The connected E-vehicle solution will be implemented in China, and with a short video we could learn about the structure of the project. The intelligent electric cars are connected to a smart traffic system which makes them able to find always the nearest charging station and to avoid the traffic jams. Taxis are running on electric batteries as well, and with a well-organized dispatching centre passengers are assured to always travel by cabs with sufficient battery. The project was presented one day later in the plenary speech by Joachim Klink, Director of the Global Automotive & Aerospace
Industry Architect, Hewlett-Packard.

The workshop ended with an active discussion on the presented ideas. As China is one of the fastest growing countries, huge efforts are taken to build cities in an eco-efficient way. Chinese city managers are trying to get all the knowledge from developed countries. But it remains a question if all those visions are implemented. Rui Zhang claimed that city governments can do most for implement new and sustainable methods. All the investments are destined to realize the transformation of old cities into smart and green cities. Sibylle Rock explained that in China it is easier to implement a new mobility-system than in Europe. Especially because in Europe people are used to some big vehicle-producers, while in China this kind of problem doesn’t exist. Chinese people are more open for new mobility technologies.
Cities hold big solutions to preserving the world’s biodiversity and ecosystems through shifting towards more sustainable consumption and production patterns. A cross-disciplinary approach linking city’s consumption and production pattern and its impact on biodiversity and ecosystems needs to be established, to inspire and promote practical solutions at city level and to decouple urbanization from biodiversity loss.

There exists a vast amount of initiatives working on issues related to biodiversity, resource and energy efficiency, climate change and urban infrastructure. Nevertheless it seems that cooperation between these initiatives is rather low. It was further found, that the majority of initiatives are rather focusing on a few actors and isolated topics and not following a broader system approach.

The key messages from the workshop will form the basis for a follow-up discussion in Switzerland, leading towards a broad international event at WRF Davos (6-9 October 2013).

Key Questions

- What are the conditions for eco-efficiency to happen?
- How can biodiversity, and its ecosystem services, be used to improve eco-efficiency and urban quality of life?
- What institutional, regulatory and financing resource barriers inhibit the implementation of green growth strategies?
- Which economic and environmental performance indicators might indicate the presence of co-benefits and policy complementarities between environmental and economic policies?
- What are the capacity building needs and (ICT) tools for urban managers and city governments to promote biodiversity-friendly and eco-efficient development?
Agenda

- 8:30 – Dr. Xaver Edelmann, welcome and introduction
- 8:40 - Rui Zhang, Program Associate, World Resources Forum
  Presenting WRF Background Paper
- 9:00 - Sibylle Rock, WW Stakeholder Engagement Manager, Hewlett-Packard, USA
  Simple City: The Impact of ICT
- 9:20 - Luis Neves, Climate change and sustainability Officer, Deutsche Telekom AG
  Greening the World Economy
- 9:40 – Stephan Wabnegger, CEO of Cree GmbH, Austria
- 10:00 - Questions, Discussion
- 10:10 – Dr. Xaver Edelmann, Closing

Background

This workshop takes place as part of the World Resources Forum 2012, which is organised by Chinese Academy of Sciences/Institute for Process Engineering (CAS/IPE) and WRF Secretariat, in Beijing, 21-23 October, 2012.

It is organized by the World Resources Forum, a global science-based platform for sharing knowledge about the economic, political, social and environmental implications of global resource use, and supported by Secretariat of the Convention on Biological Diversity (SCBD), an interdisciplinary research and services institution for the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Information about WRF 2012 can be found here: www.worldresourcesforum.org and www.wrf12.org. Or write to info@worldresourcesforum.org

For questions about the workshop you are also welcome to contact: Veronika Rékasi (veronika.rekasi@worldresourcesforum.org +41-58 765 78 50
Cities hold key solutions for protecting the world’s biodiversity and ecosystems through improving its eco-efficiency and shifting towards more sustainable consumption and production patterns. A cross-disciplinary approach linking city’s consumption and production pattern and its impact on biodiversity and ecosystems needs to be established and understood by local authorities, citizens, business, urban planners and all other actors, to inspire and promote practical solutions at city level and to decouple urbanization from biodiversity loss.
1. Links between urban eco-efficiency and biodiversity

Despite only representing 3-5 per cent of the world’s surface area, cities are responsible for more than two-thirds of our total ecological footprint, which describes the ecological demand, as measured in land area necessary to supply the goods and services associated with urban citizen's consumption, and linked production and exports. Most of the materials and services derived from nature are being consumed by, or traded in cities. From timber, water, soil, food, to metal and minerals, citizens are the largest end users of these resources extracted from biodiversity. This has been recognized at the Rio + 20 Conference last June through the background document, “The Future We Want”, in paragraphs 134-137. An assessment by the International Resource Panel 1 finds that the global extraction of natural resources, including biomass, fossil energy carriers, metal ores and construction materials has increased to 60 billion tonnes annually and this extraction rates would triple by 2050 if the consumption continues at the current level of developed countries. At the other end of this consumption, comes pollution and wastes—some being recycled, while others not and simply discharged into environment. The global municipal solid wastes generation was already 2 billion tonnes per day in 2006, and was increased by 37% till 2011 (UN-HABITAT, 2011).

Cities’ ecological footprints

Given the projected rapid urbanization for the next forty years2, cities’ impact on biodiversity (and hence the sustainability of development overall) will be largely determined by how efficient cities can be in “decoupling” their growth from impacting biodiversity and ecosystems. Under a scenario of business as usual, urbanization has a ripple effect: the more we are, the more we need. It is clear that the impact of cities on biodiversity goes beyond the linear correlation with the physical expansion of urban areas, but compounded with the factor of economic growth that can increase the order of magnitude of a city's consumption power. In China, for instance, the average housing size per capita increased 4.8 times from 1978 to 2008, which means that at least another 1.5 billion tonnes of construction steel had been added to the urban residential buildings during those years. These numbers, which continue to grow every year, can give us an idea about the possible impact of urban construction on biodiversity, simply from how much it requires products from mining and steel industry- which is just one sector among thousands involved in and evolving with urbanization.

The ecological footprints related to cities’ consumption and production patterns can be complex to measure, as they can be embodied in goods and materials, and relocated through trade and services. The soaring demand for natural resources along with the rapid urbanization and the emergence of another 1-3 billion middle-class consumers, and the alarming rate of biodiversity loss and ecosystems degradation today, urges the need for better understanding of the link between consumption and production patterns and its impact on biodiversity, as to identify effective solutions addressing the root-causes.

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1International Resource Panel, led by UNEP. http://www.unep.org/resourcepanel/Portals/24102/PDFs/SYNOPSIS%20Final%20compressed.pdf

2By 2050, almost 3 billion additional people will inhabit the world’s cities, and the world will have undergone the largest and fastest period of urban expansion in all of human history. Most of that growth will happen in developing cities over 1 million inhabitants – China and India, with almost a third of the world’s population, are urbanizing at unprecedented rates and are responsible for over 30% of that growth (Cities and Biodiversity Outlook, 2012).
What is eco-efficiency? How can it be applied for cities?

Eco-efficiency is often used in expressing how efficient economic system is with regard to the extraction and use of natural capital and environmental impact. The concept of eco-efficiency can be traced back to 1970s as the concept of “environmental efficiency”, measuring the ratio between economic gain per environmental cost (Freeman, 1973). In 1990, this term was introduced as “business link to sustainable development” (Schaltegger, 1990) and popularized by the World Business Council for Sustainable Development (WBCSD) for the business sector in the course of the United Nations Conference on Environment and Development (UNCED) in 1992. Eco-efficiency thereafter is often used to in expressing how efficient economic activity is with regard to nature's goods and services. The United Nations recognizes eco-efficiency as a key element for promoting fundamental changes in the way societies produce and consume resources, and thus for measuring progress in green growth (UNESCAP). Eco-efficiency, or doing more with less, is also a key concept for achieving a Green Economy (Rio +20, 2012).

Eco-efficiency can achieve fundamental changes in the way societies produce and consume resources. At city level, eco-efficiency can be particularly useful for integrated planning, because city is a multi-sectoral, multi-stakeholder system and its ecosystem is a common asset to all. It is important that decision makers and urban planners take an ecosystem approach to evaluate the impact of single urban element or project to the overall eco-efficiency of a city, taking into account the needs of other stakeholders in the city and the inter-dependence between them. For example, a company with relatively high water-efficiency in its operation according to its industrial standard may still lower the overall eco-efficiency of its host city which is facing a water shortage; urban parks do not generate direct economic income per hectar as high as commercial-use land, but can contribute to the increase of land-value in its neighborhood by improving the urban environment, quality of life and investment opportunities (ecosystem services from biodiversity).

An ecosystem approach in urban planning towards greater eco-efficiency can help decision-makers to overcome the temptation of pursuing short-term economic output at the cost of depleting natural capital, but rather consider the long-term value from investing in ecosystems' health and biodiversity.

Suqian, China. Sited between the Hongze Lake, Luoma Lake and the Grand Canal in China, Suqian, a new city established in 1996 in Jiangsu Province, has achieved remarkable economic growth and ecological harmony. By 2011, the city's GDP rose by 10.5 times, while the population increased by 5 times from 1996. Suqian's development strategy is to develop as an "ecological city": The city's investment of 17.08 billion RMB in environmental protection and its compliance on “The Overall Plan of the Ecological and Functional Reserve” has created nine city-level ecological and functional reserves within this fast-developing city. In addition to the achievement in preserving healthy ecosystems of freshwater, forest and rich biodiversity, this overall plan and implementation of Suqian has also created an “China Excellent Tourism City” with 34 National Tourist Attractions, a wood-based industry with an output value of 33.93 billion RMB, botanic business with employment for 168,000 people, and hundreds of enterprises in integrated utilization of resources and cleaner production. The economic, environmental and social benefit from Suqian's development path is an example for eco-efficiency at city level.
The sustainable use of biodiversity can help cities achieve many sustainable development goals. While urbanization continues and imposes new challenges, the sustainable management of ecosystems and biodiversity should be at the base of a menu of technologies and solutions available to decision makers at the local level (urban green technologies). Urban infrastructure can be designed and built for greater resource efficiency by integrating biodiversity and ecosystems: a bio-urban approach to urban planning and management, or, so-called "ecological civilization". To dispose of waste, purify freshwater, clean up pollution, reduce energy needs through temperature regulation in heat islands, and maintain its citizen's health, cities need ecosystems services and biodiversity. Freshwater purified and filtrated through functioning wetlands and forested watersheds (supported by appropriately designed urban infrastructure) cost a city 10 times less than chemical treatment plants and distant sourcing. A network of parks increases surrounding property values by up to 20% and creates local jobs, green parkways generate businesses as urbanites look for cleaner air. Green roofing and vertical gardens (not to mention surrounding parks) can reduce a building's energy bill in cooling and heating by up to 30%. Being green as a city can attract green investors, exactly the kind of business that generates tomorrow’s technologies and related jobs and investment options, creating new economies of scale and laboratories of innovation. In developing countries, the sustainable use of biodiversity can also offer (through for instance urban agriculture, essential for food security, or through the payment for ecosystem services) critical livelihood options and business opportunities for micro, small and medium enterprises towards poverty eradication. There are proven technologies that can increase a city’s biodiversity by bringing it back to serve its citizens, and reduce its footprints on ecosystems far away, while simultaneously increasing the quality of life for citizens. Based on those practices, a wave of cities have produced, or are in the process of producing, urban sustainability plans for up to 20 years, including New York, Mexico City, Sydney, Melbourne, Nairobi, Singapore, and Jakarta. Many of these are addressing resource efficiency and biodiversity, but still as separate and distinct topics.

**Freiburg, Germany:** Focusing early on environmental sustainability, photovoltaics and biotechnologies has given the city a decisive edge in an international competitive environment. Today, about 12,000 people are employed in the environmental and solar industries alone. In June 1992, the Freiburg city council adopted a resolution that it would permit construction only of “low-energy buildings” on municipal land, and all new buildings must comply with certain “low energy” specifications. Low-energy housing uses solar power passively as well as actively. In addition to solar panels and collectors on the roof, providing electricity and hot water, many passive features use the sun’s energy to regulate the temperature of the rooms.

Natural resources are critical to the vitality of local economies. A city depending heavily on natural resources at an unsustainable rate in its economy always faces a dilemma. The growing needs for more resources and the depletion of natural capital reserves due to over-exploitation form a pair of twin-challenges for the future and resilience of a city. Ecological crisis – floods, exposure to extreme weather, contamination of freshwater reservoirs, breakdowns in the supply of food - is already happening in many places where the rapid urbanization and economic growth is built at the cost of the health of ecosystems. The health of urban citizens is also affected by biodiversity: regular use of parks, a more active lifestyle and the reduction of islands of heat significantly reduce health costs in non-communicable diseases such as obesity, diabetes and respiratory ailments such as asthma. When a failing ecosystem can no longer provide the input for economic production, it does not take long to come to the point that its provision for people’s basic consumption is also jeopardized.
Taihu, China, a lake in the lower Yangtze River basin, is the main water source for China’s most developed area and has nurtured the growth of large cities including Shanghai, Nanjing, Suzhou, Wuxi, counting for 1/7 ~ 1/8 of China’s GDP. Since 1990s, Taihu’s pollution due to unsustainable aquaculture and industrial waste discharge become worse. Water became undrinkable and blue algae outbreaks were getting more often. Biodiversity was drastically changed. The prosperity built around the lake were facing the immeasurable loss caused by water crisis. During the past 11 years, the bill for Taihu restoration mounted to 37 billion, yet the result remained modest until ecological restoration methods were introduced together with other management measures.

By introducing tens of thousands of chubs and java tilapias into the lake to feed on blue algae, the water quality has been much improved effectively. In the recent algae-control fish release, some fish were implanted with chips for water quality monitoring purpose. Hopefully soon the fish in the lake can be qualified as food again.

Sustainable consumption and production can make urbanization more biodiversity-friendly. Given all the challenges rising with urbanization, cities today have good opportunities to make a difference, if they make consumption and production more sustainable. As identified by the International Resource Panel, greater population density enables lower per capita resource use and lower per capita emissions (UNEP, 2012). For the same population (and for a generally similar standard of living), the city of Atlanta, USA, occupies 26 times more land than Barcelona, with its more densified occupation pattern. This implies a potential for cities to become more resource efficient and therefore biodiversity-friendly.

The great intellectual, technological and financial capacity of cities consistently offer solutions never imagined before. In this context, cities are the laboratory of innovation needed for a bio-urban revolution, and they hold big solutions for the future of biodiversity. Clean technologies, sustainable lifestyle, choices for sustainable products and services, green urban infrastructures and landscapes, more environmental-friendly alternative materials and methods in building and construction, in communication and transport... Many options can be found and applied in cities to become more sustainable. For example, the subway system in the New York City makes the city more energy efficient than suburban or rural areas in the United States. The New York City's plan, PlaNYC2030, further sets goals for reductions in energy and water use, culminating in a planned 30 per cent reduction in greenhouse gases emissions by 2030. In Sweden, the city of Växjö generates 51 percent of its energy from non-fossil fuel energy sources. Given that climate change is among the most serious factors for biodiversity, cities’ role in preserving biodiversity through shifting towards more climate-friendly consumption production is remarkable.
2. Linking solutions

Many of those solutions are already available in the many networks of cities, and only need support for effective dissemination. At global level, a 10-year Framework of Programmes on Sustainable Consumption and Production was recently adopted at the Rio+20 Conference. The International Resource Panel (www.unep.org/resourcepanel) tackles global resource issues through identifying interlinkages and gaps, and provides scientific impetus for decoupling economic growth and resource use from environmental degradation. ICLEI- Local Governments for Sustainability, a network of 1,200 cities, manages its Local Action for Biodiversity programme and publishes best practices (http://www.iclei.org/index.php?id=lab) The World Resources Forum (www.worldresourcesforum.org) is a global multistakeholder platform promoting innovation for resource productivity through knowledge-sharing. In its 2011 WRF conference Mark Swilling (South Africa) presented the challenges of the “second urbanization wave” for Africa’s development in a resource-constrained world. Many speakers referred to “urban mining” (recycling metals from waste) as a key strategy towards resource supply security, and raising awareness on environmental issues through community networks was mentioned as well. Local action was mentioned, such as the integrated energy concept 2050 of the Swiss city of St. Gallen.

In an increasingly connected world, cities’ sustainable choices can further influence their business and trade partners inside and outside. For instance, at the surge of the global iron & steel market and the growing awareness (mostly originating in urban centres) of its biodiversity impact, some mining companies have started looking into ways to green their operations, for instance through using energy efficient trucks and remote monitoring and control technologies. Meanwhile, by promoting metal recycling, cities can reduce the pressure on environment and maximizing the economic benefit of extracted materials.

The link between urban life and biodiversity exists widely. A shift from the consumption of long-distance imported food to locally produced food (through support for local and fair trade/organic market networks, for instance) can promote urban and peri-urban biodiversity, small-scaled and environmental-friendly farming, and save energy for transport. The wide usage of information technology and telecommunication is also a change for higher efficiency in cities. Avoiding the of plastic bags in many cities helps to alleviate the pressure of the ”white pollution”, which travels from land to oceans to create permanent huge islands of solid waste and cause disaster to many birds and marine life.

This link is being communicated more often to citizens: today, urbanites can learn to live with more nature, and consume and live in biodiversity-friendly ways. The efficiency of well-known campaigns like: “Use less paper, save more trees”, “Buy local and organic, eat well”, “Do not step on the grass”, “Deer crossing ahead, drive slowly!” has been proven again and again. People in cities need to become more and more aware that in the habitat of Homo sapiens also live many other species and that their existence makes our city a happy, healthy and harmonious place.

Today, 1 million mayors across the world are trying to find new, cost-effective and often quite unexpected solutions simultaneously respond to all economic, social and environmental challenges. At the 2010 World Expo in Shanghai, a declaration was made by all participants to

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3Shaping the Future of our Natural Resources – Towards a Green Economy, Highlights of World Resources Forum, Davos, Switzerland, September 19-21, 2011, St. Gallen, Switzerland, December 2011
demonstrate a human aspiration for “better city, better life”, in which the top proposal was achieving an “ecological civilization” through sustainable consumption, production and lifestyles:

“Cities should respect nature, consider the urban ecological environment as an asset, integrate environmental issues into urban planning and administration, and accelerate the transition to sustainable development. They should promote the use of renewable energy sources and build low-carbon eco-cities. They should strongly advocate for conservation of resources and promote environment-friendly manufacturing. Cities and their citizens should join together to create sustainable lifestyles and an ecological civilization in which people and environment co-exist in harmony”

Shanghai Declaration, World Expo 2010, Shanghai, China
From the above, the following proposals can be discussed during the events:

a) For eco-efficient urban planning: To develop and promote the use of a practical tool for incorporating ecosystem approach in urban planning, taking into account biodiversity impact and its policy entry-point to the urban planning related decision-making process.

b) To make urban eco-efficiency and urban biodiversity-friendliness measurable. Some existing tools for measuring city's sustainability, for example, McKinsey's Urban Sustainability Index, could be further developed for this more specific purpose.

c) Translate Aichi Biodiversity Target 4 into action plans at city level towards a measurable progress by 2020.

d) Utilize the WRF/CBD/ICLEI Eco-Efficiency Lab to promote innovative solutions and green urban technologies, and to identify, consolidate and disseminate best practices in sustainable consumption and production, focusing on preserving biodiversity and ecosystem services through mobilizing support from local and sub-national authorities and initiating local actions.

Complementary roles:

• WRF brings scientific community, private sector and governments on SCP, and organizes regular milestone events. It also provides the forum where local authorities can interact with specialists for energy and resource efficiency to incorporate the state-of-art green urban technologies into urban development projects.

• SCBD works with the Convention's 193 Parties and their partners, which adopted a global Strategic Plan on Biodiversity and a specific Plan of Action to engage cities and provinces through the Global Partnership on Sub-national and Local Action on Biodiversity. The Secretariat has a track record of over 5 years and a mandate to link national-level policies to sub-national and local authorities on biodiversity and ecosystem services.

• ICLEI brings leading cities across the world and the know-how on how to engage them in projects. It can mobilize experts towards capacity-building programmes.

• UNEP and UN-HABITAT can provide political outreach to countries, urban planners and development/settlement/housing institutions.

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4 Target 4  By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.