BUILDING SUSTAINABLE CITIES AND LIFESTYLES IN LATIN AMERICA AND THE CARIBBEAN (LAC)

May 17–20, 2016
San José I Costa Rica

Meeting Report WRF LAC & ISBC 2016
This report was drafted by Bas de Leeuw, Xaver Edelmann, María Lucía Híjar, Cecilia Matasci, Matthias Schluep, Sonia Valdivia, Angel Versetti and Adriana Zacarías based upon inputs from workshop reporters, speakers and participants.

The report has not been reviewed by the speakers.
World Resources Forum (WRF) is an independent non-profit international organization that serves as a platform connecting and fostering knowledge exchange on resources management amongst business leaders, policymakers, NGOs, scientists and the public.

The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system and serves as an authoritative advocate for the global environment.

The International Resource Panel (IRP) is a science policy platform set up by the United Nations Environment Programme to build and share the scientific knowledge needed to improve our management of natural resources worldwide.

The Green Building Council Costa Rica (GBC-CR) is an association that supports green building in this country and the region. It is a member of the World Green Building Council (WGBC) and its goal is to promote cooperation and citizen’s involvement to reach social, economical, cultural and environmental community development targets through the recognition of green construction principles. The logic is to lead a market transformation, both for the public and private sector’s practices. To this effect, GBC-CR develops and maintains strategic alliances with national and international agencies, such as World Bank IFC, for which GBC-CR is the exclusive EDGE Certifying Body for Costa Rica.
**List of Acronyms**

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<th>Acronym</th>
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<tr>
<td>10YFP</td>
<td>10-Year Framework of Programmes on Sustainable Consumption and Production</td>
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<td>ABCV</td>
<td>Brazilian Association of Life Cycle (associação brasileira de ciclo de vida)</td>
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<td>ADDERE</td>
<td>Association of Electrical and Electronic Industries (asociación de la industria eléctrica electrónica)</td>
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<td>ALCALA</td>
<td>Association for Life Cycle Assessment in Latin America</td>
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<td>BCIE</td>
<td>Central American Bank for Economic Integration</td>
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<td>CADIS</td>
<td>Centre for Life Cycle Analysis and Sustainable Design (centro de análisis de ciclo de vida y diseño sustentable)</td>
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<td>CEGESTI</td>
<td>Foundation Centre for Technology Management and Industrial Informatics (fundación centro de gestión tecnológica e informática industrial)</td>
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<td>CER</td>
<td>Centre for Eco-efficiency and Social Responsibility (centro de ecoeficiencia y responsabilidad social)</td>
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<td>CML</td>
<td>Institute of Environmental Sciences</td>
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<td>CMP</td>
<td>Mexican Cleaner Production Centre (centro mexicano para la producción más limpia)</td>
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<td>CMPBS</td>
<td>Center for Maximum Potential Building Systems</td>
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<td>CNPML</td>
<td>National Cleaner Production Centre (centro nacional de producción más limpia)</td>
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<td>COP</td>
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<td>CPLB</td>
<td>Bajío Cleaner Production Centre</td>
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<td>CPML</td>
<td>Cleaner Production Centre (centro de producción más limpia)</td>
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<td>EDGE</td>
<td>Excellence in Design for Greater Efficiencies</td>
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<td>EPD</td>
<td>Environmental Protection Department</td>
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<td>EPR</td>
<td>Extended Producer Responsibility</td>
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<td>FICCI</td>
<td>Federation of Indian Chambers of Commerce and Industry</td>
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<td>FOEN</td>
<td>Swiss Federal Office for the Environment</td>
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<td>GI-REC</td>
<td>Global Initiative for Resource Efficient Cities</td>
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<td>German Association for International Cooperation (deutsche gesellschaft für internationale Zusammenarbeit)</td>
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<td>Brazilian Institute of Information in Science and Technology (instituto brasileiro de informação em ciência e tecnologia)</td>
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<td>Institute for Environmental Research and Education</td>
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<td>IFC</td>
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<td>Institute for Global Environmental Strategies</td>
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<td>INCAE</td>
<td>Central American Institute of Business Administration (Instituto Centroamericano de Administración de Empresas)</td>
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<td>International Resource Panel</td>
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<td>Technological Institute of Costa Rica</td>
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<td>LAC</td>
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<td>Life Cycle Assessment</td>
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<td>LEED</td>
<td>Leadership in Energy &amp; Environmental Design</td>
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<td>National Metrology Institute of Germany</td>
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<td>RECP</td>
<td>Resource Efficient and Cleaner Production</td>
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<td>Global Network for Resource Efficient and Cleaner Production</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<td>Swiss Secretariat of Economic Affairs</td>
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<td>SENAI</td>
<td>National Centre for Clean Technologies of Brazil (Centro Nacional de Tecnologias Limpas)</td>
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<td>SETAC</td>
<td>Society of Environmental Toxicology and Chemistry</td>
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<td>Finnish Innovation Fund</td>
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<td>SMEs</td>
<td>Small and medium-sized enterprises</td>
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<td>SRI</td>
<td>Sustainable Recycling Industries</td>
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<td>Sustainable Social Housing Initiative</td>
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<td>United Nations Environment Programme</td>
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<td>United Nations University</td>
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<td>WEEE</td>
<td>Waste Electrical and Electronic Equipment</td>
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WRF-LAC & ISBC 2016: Building sustainable cities and lifestyles in Latin America and the Caribbean organised by WRF, UNEP & GBCCR is a climate neutral event.

For the period 17.05.2016 to 20.05.2016, the greenhouse gas emissions related to the event have been measured and offset. The emissions amounted to:

**238 tonnes of CO₂e**

WRF, UNEP & GBCCR have offset the emissions related to the event by investing in South Pole Group’s climate protection project:

**Asorpar: Arauca Forest Conservation**
Colombia (300658)

For more information about our services and more than 400 climate protection projects, please visit: [thesouthpolegroup.com/projects](http://thesouthpolegroup.com/projects)

Renat Heuberg
CEO, South Pole Group

This certificate is issued by South Pole Group. The CO₂ emissions indicated on the certificate are compensated through investments in the above mentioned carbon offset projects based on international standards. Certificate no. spg C11046N, 06.2016
1. World Resources Forum Latin America and the Caribbean (LAC) & the International Sustainable Building Congress 2016 took place in San Jose, Costa Rica from 17 to 20 May 2016 under coordinated efforts of WRF Secretariat, Green Building Council Costa Rica (GBC-CR) and UNEP. The event drew over 266 participants from 30 countries, who attended 5 plenary sessions, 22 workshops and scientific sessions with 29 presentations. The key topics covered during the conference included: sustainable business and financing; bioeconomy and priority resources for cities; sustainable lifestyles and education; resource efficiency policies for sustainable cities and lifestyles; and sustainable and inclusive cities and buildings. The conference also focused on the implications of the Paris Agreement (COP21) for its key topics. The outcomes and conclusions of the conference will contribute to UN 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP) and Habitat III conference that will be held in Quito on October 17–20, 2016.

2. The overarching question sought by the conference attendees was how to build sustainable cities and lifestyles in the region of Latin America and the Caribbean (LAC). Cities are indeed important centres for socio-economic development, as well as for interaction and innovation amongst different groups of society. With their immense footprint, cities offer a great potential for transformation: occupying merely 3% of land, they consume 75% of natural resources and 60-80% of energy resulting in 75% of carbon emissions globally, which leads to inequitable development. Trends are showing that this process will keep accelerating, which means that business-as-usual attitude is no longer a viable option. Knowledge is already available but not all the enabling conditions are there.
3. It is estimated that 60% of urban infrastructure required by 2050 is yet to be built – and therein lies the great opportunity of getting urban development right. Existing knowledge, expertise and technologies are also giving this process an unprecedented comparative advantage. However, to fully realise the potential of sustainable urban development, a paradigm shift is needed. For instance, measuring the well-being of population should go beyond GDP; when devising development indicators, their quality and pertinence should be emphasised and not simply their quantity; economic models could consider cooperation alongside or instead of competition; and there should be a focus on Eco-systems instead of Ego-approaches.

4. There are different approaches to increase resource efficiency in cities. They include life cycle thinking, approaching cities as metabolisms, decoupling as well as eco- and social innovation. These approaches will lead our society to use less materials, energy, water and land resources to achieve more economic and social output. One thing is clear, however: there will not be sustainable cities without sustainable lifestyles – and vice versa.

5. The enabling conditions for emergence of sustainable cities in the LAC region need to come mainly through efforts of the public sector in cooperation with the private sector. Relevant work-streams should emerge at all levels of government through vertical integration and shared responsibility. National and local governments could work on policy frameworks to reorient investment and change behaviours, providing the enabling conditions – software and hardware – for sustainable choices for businesses and individuals’ lifestyles. Investment needs to be resilient, with internalisation of long-term costs, e.g. by addressing sustainable and affordable social housing. This constitutes an important contribution to inclusiveness and leapfrogging, as well as to minimising future costs.

6. Building codes should incorporate disaster prevention, climate change mitigation and adaptation with proper enforcement and capacity building mechanisms. Green open public spaces should be ensured in order to enable social interaction and leisure. Procurement strategies and transparency mechanisms are powerful tools for resource efficiency and can help define effective transition pathways. Public-private partnerships and participation of civil society in urban development processes should be increased. The urban-rural nexus also deserves attention of involved stakeholders.
7. Cities can be restructured through local projects aiming for healthier lifestyles. Long-term targets and goals should be developed for the benefit of citizens instead of personal interest of politicians. Public transport needs to be efficient, convenient and rapid in order to reduce people's dependency on cars and move cities towards large-scale and more efficient transportation. Soft mobility, i.e. mobility which is people-friendly and environmentally friendly such as cycling and walking, should also be promoted. Food security in urban areas is also important in the context of urban food production. Other key sectors where important elements of governance are emerging include the management of water, food, waste, ICT and finance. The finitude of resources should be kept into consideration.

8. A big challenge is to find the right balance in the planning of “compact cities” between population density and amount of green space available. There is robust empirical evidence and availability of various indicators and metrics that show the benefits of decoupling and resource efficiency for the economy in general and cities in particular. Furthermore, clear and internationally agreed definitions of sustainable infrastructure and cities are important to guide national and local city planners.

9. When considering sustainable urban development, policy makers and stakeholders should consider how to empower sustainable lifestyles in cities.

10. System thinking is necessary to record and analyse the complexity of lifestyles in cities and to find innovative and integrated solutions for the pressures in cities. Generating more solutions could follow through bio-mimicry, whereby there is imitation of natural systems, where there is no waste. Involving citizens is also important with clear narratives functioning as guidelines for citizens to apply sustainability concepts in their daily activities. Citizens are indeed an essential part of the transformation. To assist this process, capacity building, life-long learning and awareness raising as well as cultural aspects and identity are crucial. At the same time, empowering sustainable lifestyles is a shared responsibility; the one in which government, private sector and society need to provide the enabling conditions – both software and hardware – to bring about the desired change.

11. We also need to redefine the role models and the concepts of happiness and success in order to better understand what really matters and to mainstream the notions of collective good and solidarity – caring for others.

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Ana Quiros, President GBC-CR
12. Technological solutions exist and are important, but nevertheless they are not sufficient without changes in consumption and production patterns. The time has come to combine ideas and visions with concrete actions at the local level. We should trust in our human creativity to find more solutions and should restore the social tissue (tejido social), solidarity and traditions. The changes start with “first adopters” and get diffused by following the example. This also includes promoting sustainable lifestyles among poor communities, teaching the poor how to consume sustainably.

13. Platforms such as the WRF, GBC-CR, UNEP and others are necessary for dialogues, exchange of knowledge and enhancing the development of roadmaps towards this gradual change.

14. The co-organisers intend to bring the conclusions of the conference to major international and regional forums, in particular the upcoming Habitat III conference, to be held in Quito, on October 17 – 20, 2016.

Leo Heileman (UNEP ROLAC), Ana Quiros (GBC-CR) and Xaver Edelmann (WRF),
Congress Co-chairs
1 PHOTO GALLERY

Gilberto Monge, Major of the canton of Mora, Costa Rica

Rosendo Pujol, Minister of Housing and Human Settlements in Costa Rica
PLENARY III – EMPOWERING AND ENABLING SUSTAINABLE LIFESTYLES IN CITIES

Session chair: Adriana Zacarías Farah, UNEP ROLAC

Speakers
Steve Aronson (Demain Foundation), Irene Cañas (Vice Minister of Energy of Costa Rica), Astrid Hollander (UNESCO), Kenneth Ochoa (Universidad del Bosque, Colombia).

“Moving to sustainable lifestyles means rethinking our ways of living, how we buy and what we consume. It also means rethinking how we organise both our personal and community daily lives, altering the way we socialize, exchange, share, educate and build identities. It is transforming societies, through systems thinking, and ensuring human well-being and healthy ecosystems.” – Adriana Zacarias Farah, UNEP.

Our lifestyles define, connect and differentiate us. They are about how we organise and direct our lives and how we interact with one another in the daily choices we make. They also have important impacts on our environment, our communities and contribute to, if not drive, environmental and social issues that result from our individual and collective decisions, such as: inequity, climate change, resource scarcity, pollution, among others. As we know, urban areas currently account for 60-80% of global energy consumption, 75% of carbon emissions, and use more than 75% of the world’s natural resources. In parallel, 2-3 billion new urban consumers coming on-line in developing countries will sorely test the systems of interlinked value chains and shaping policies that fulfil lifestyles around core domains such as food, mobility, housing and leisure. Shifting citizen lifestyle decisions to more sustainable ones has the potential to be a game changer.

Sustainable lifestyles need to be enabled by efficient infrastructures as well as individual actions. Creating more sustainable ways of living means rethinking how we organise both our personal and community daily life, altering the way we commute to work or school, the way we communicate, shop and eat, and where we live — which in turn affects (or are affected by) the urban planning and management. This effort requires system thinking and integrated solutions able to provide the “hardware” (regulatory frameworks, infrastructure, market signals, financial schemes, etc.) and “software” (information, values, believes, etc.) required for this radical transformation and behaviour change. Enabling sustainable lifestyles is crucial for the construction of efficient, inclusive and sustainable cities.

The discussion around the need for sustainable lifestyles is not new but is solidifying. The global mandate is clear as the Sustainable Development Goals (SDGs) specifically include the issue of sustainable lifestyles in Goal 4 related to education and Goal 12 related to sustainable consumption and production. The target 12.8 aims at “By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature”.
The plenary focused on the discussion on how to enable the adoption of sustainable lifestyles.

Kenneth Ochoa – Universidad del Bosque, highlighted that our lifestyles are determined by multiple factors, and we need to design solutions to minimize the environmental and social impacts of those decisions or preferences. For that, we need to define clearly what sustainable lifestyles are, and learn from nature, adapting bio-mimicry. Nature does not generate waste. It is also necessary to consider and look at the lifestyles, behaviour and purchase preferences that are transmitted by generations (family) and social pressure. We need to look at different tools and policies necessary to enable the change towards sustainable lifestyles and consider how they can also support the change towards a different model of development – sustainable development.

Astrid Hollander – UNESCO, focused on the role of education and values in enabling sustainable lifestyles. She highlighted that education is a powerful tool to change the world. The SDGs point out the importance of education for sustainable development. Education can re-enforce and support the “collectiveness” and “solidarity”, as well as look for more social and technical innovation. We need to change the social/individual aspiration of “having more and more” and notion of happiness and success, which are not linked to higher income. We could learn from other approaches such as “Vivir Bien” or “Buen Vivir”. Furthermore, she mentioned some important elements to consider in the design of sustainable cities such as: green public spaces, promotion of culture and sport which in fact support the transition to sustainable cities and also to restore the “tejido social” (social fabric).

Irene Cañas – Vice-Minister of Environment and Energy, focused on the role of government in enabling sustainable lifestyles. She emphasized that the government can support both: the software and the hardware and provided some examples of policies and initiatives in Costa Rica, such as: Bandera Azul, Limpia tu Huella, the National Recycling Strategy with a good participation of public and private sector. A National Policy for sustainable consumption and production is under development with the participation of 5 different ministries. The vice-minister also mentioned some key challenges such as the need to change the energy matrix, sustainable transport and reduce the plastic and waste generation. Moreover, she emphasized that we need to have “well informed and demanding consumers” (consumidores exigentes) to generate changes in the production.

Steven Aronson – Demain Foundation, provided the perspective of the private sector and the approach of the first adopters, which has in fact been the driver of important innovation and changes in the market and lifestyles. He stressed the “need to change visions with concrete ideas, which does not need to be necessarily global, but local”. 

Panel discussion
TURNING WASTE INTO RESOURCE FOR DEVELOPMENT: ROADMAP FOR LATIN AMERICA AND THE CARIBBEAN

Workshop organised by WRF and RECPnet

Session chair: Sonia Valdivia, Sustainable Recycling Industries (SRI) Programme and WRF

Speakers
Marcos Alegre (CER, Peru), Luis Briceño (IPES, Peru), Federico Corrales (GIZ, Costa Rica & Bolivia), Joseane M. de Oliveira (SENAI, Brazil), Daira Gómez (CEGESTI, Costa Rica), Carlos Hernández (CNPML, Colombia), Sergio López (CPLB, Mexico), Mathias Schluep (SRI Programme and WRF, Switzerland).

Introduction
Wealth and resources can be generated from waste that contains metals while minimising negative environmental and social impacts and creating sources of income for the most vulnerable people in our societies. Recycling metals such as aluminium, copper and gold found in waste from computers and electrical equipment to cars and ships is a rapidly growing economic activity worldwide. In developing countries, more than 50% of waste that contains metals is collected and recycled by informal workers. In Latin America alone, the annual amount of e-waste generated is expected to grow from 2.84 million tons in 2009 to 4.79 million tons in 2018. Per capita generation of WEEE (Waste Electric and Electronic Equipment) amounts to 5.3 kg/a (UNU, 2014). LAC initiatives and tailored regulations are emerging but a lack of regional articulation is still missing.

About 40 participants joined the WRF & RECPnet workshop which had the aim to furnish the participants with an update about current activities on recycling of waste that contains metals in the LAC region and to discuss potential next steps towards a roadmap and cooperation opportunities at a regional level.
Key messages

- **Cooperation among countries for the development of legal frameworks and mechanisms** is critical to support the sustainable management and recycling of WEEE. While countries such as Colombia, Chile, Costa Rica, Brazil, Peru and Ecuador have more advanced regulations e.g. on Extended Producer Responsibility (EPR) covering e-waste, other countries still lack of enabling conditions from the legal perspective.

- **Binational and international programs for controlling smuggling activities** in the region is essential. Different economic contexts and regulatory frameworks incentivize the uncontrolled and illegal transfer of WEEE between countries resulting in more informal activities and negative socio-economic and environmental impacts. Cooperation among neighbouring countries would be an effective measure to tackle this trade issue with economic, social and environmental implications.

- **A one-stop shop** at regional level to facilitate the exchange and speed-up the learning curve. Taking advantage of existing experiences in the region, a regional hub could facilitate the exchange among countries and make available materials and local expertise on business models, better recycling practices, eco-innovation and life cycle thinking in waste management.

- **Improved cooperation among international agencies for development**. Several international organizations are supporting national and regional WEEE activities and coordination of plans and activities would be of benefit for LAC countries: Swiss Secretariat of Economic Affairs (SECO) is active in Colombia and Peru; The United Nations for Industrial Development Organization (UNIDO) is supporting several NCPCs; The National Metrology Institute of Germany (PTB) is active in several LAC countries.

- **Need for more local capacities**. The group of experts gathered agreed that more efforts should be done to increase the number of local experts, e.g. to serve as consultants or certifiers in WEEE management activities.

- **Beyond WEEE and the need for including other types of waste that contains metals**. Most existing regulations and legal frameworks concern WEEE and disregard other types of waste also containing metals such as used or waste from metal industries. More comprehensive regulations are required to improve the quantity and quality of metal recovered in LAC countries. Key factor for success would be the formation of alliances with big metal producers.

- **Data on materials flow**. Taking into account that “what can’t be measured, cannot be managed” (Peter Drucker), there is a need for data generation at national level to develop e.g. sustainability and performance indicators in the context of policy making and sustainable management of recycling metals.

Next steps

Participants agreed to continue the discussion about regional cooperation and to work on a regional proposal that takes into account the findings of the workshop.
LIFE CYCLE THINKING – URBAN METABOLISM

Training organised by the International Resource Panel (IRP), the UNEP/SETAC Life Cycle Initiative and WRF

Session chair: Jacob Halcomb, UNEP

Background Information
The Latin America and the Caribbean region is one of the most urbanized in the world, with an 80% of the population living in the cities. Throughout the region, city managers need to face a number of different social, economic and environmental challenges. In the region, pressure on resources is growing: the demand for energy, for instance, is rising and is expected to double by 2030; so is the demand for housing, with 60% of the building stock still to be built to meet the needs of the urban population in 2050. Overall, the long-term development gains are threatened by shocks and stresses that can be particularly severe in urban areas.

UNEP recognizes the growing need to address global environmental concerns from an urban perspective and to integrate the urban dimension of global environmental issues. This is why it supports cities across the world in addressing environmental impacts and in integrating the environment into their long-term strategic planning. In June 2012 at the Rio+20 global summit, UNEP launched the Global Initiative for Resource Efficient Cities (GI-REC) to capitalize on the potential for cities to lead action towards greater resource efficiency and to integrate resource efficiency along with sustainable production and consumption into policies, tools and decision-making at the city level.

In this context, UNEP proposed a workshop to discuss science-based approaches to understand cities’ consumption patterns of natural resources, and how they can contribute to policy-making.

Objectives
The objective of the workshop was to explore how science-based approaches to measure sustainability, such as urban metabolism and life cycle-based hotspots analyses, can be applied to cities and how they can be further embedded in ongoing efforts to enhance cities’ sustainability. The expected outcome is a short document on the identified opportunities for areas of work, and specific indicators where urban metabolism and life cycle-based data and approaches could be further embedded in specific indicators and initiatives.

Presentations
The workshop began with foundational presentations from technical experts, listed below.
- A short introduction to the Urban Footprinting concept by experts Anu Ramaswami (IRP) and Mauricio Leon (University of Minnesota).
- An introduction to the GI-REC toolkit and process of development for the application of urban metabolism at the city-scale by Blake Robinson (Sustainability Institute).
- Brief introduction to life cycle based hotspots analysis approach presented by Jim Fava (thinkstep)
After lively discussion, attendees reported back with the following findings:

What are the opportunities and limitations of applying life cycle thinking at the city scale?

**Opportunities**
- Tools can support a holistic perspective
- Number of studies exist with quantified results allowing us to learn how to use these results at the city scale through life cycle thinking
- Some data at the city scale is already available (e.g. climate change data)
- Existing experiences at the macro-level (e.g. circular economy is being promoted at national level, it is often easier to implement these approaches at city level)
- Life cycle thinking allows discussion about negative and positive impacts, this is important because we tend to focus on the negative side only (job creation, well-being)
- Increasing awareness, pressure, and momentum on this issue

**Limitations**
- If we want to use life cycle data there is an issue with availability, more effort is needed to generate and mine data
- Lack of capacity, not many experts or city officials that can understand or read results
- Methodologies are in early stages, not many studies at the relevant scale
- Lack of results comparability because of different approaches/methodology/scope
- English-centric information, not readily available in other language, need local language results
- Results are difficult to communicate

**What are the overlaps or gaps in the existing work?**
- Lack of local data, some data exists but is disaggregated or not readily available
- Lack of standard methodologies to measure impact from material use
- How to incorporate unexpected events like disasters, accidents
- Lack of nexus analysis/tools e.g. they generate results in specific resource, e.g. on water or climate but not on food/water/energy
- Behavioural analysis is lacking
- Lack of consideration of integration of socio-economic impacts

**Experiences and appraisal of life cycle based footprinting of cities with examples from the region** by Nydia Suppen (CADIS, Mexico)

**Using Input-Output Analysis to Measure the Environmental Pressure of Consumption and Production at City Level** by Arnold Tukker (CML, Leiden University)

Training attendants
How can future efforts build on or link with existing tools and methods for measuring city sustainability?

- Connecting experts and practitioners
- Use international efforts, like IRP, UNEP/SETAC Life Cycle Initiative, and GI-REC to cultivate a consensus on methodology and approaches
- Create a repository with inter-operable and transparent data
- Civil society should be better engaged and more effort to solidify political will and commitment from local governments, as well as greater engagement with all stakeholders
- Capacity building to generate awareness, knowledge, and local expertise
- Incentives (e.g. technical cooperation) to facilitate greater data access, information sharing, etc.
- Public-private partnerships to promote cooperation and engagement with private sector
- Open source tools in local language
- Further development of economic valuation of resources for mid and long-term scenarios

Who are the actors that we should engage and what are the concrete next steps we can take?

- Engage educational actors, international actors, utilities, national offices on improving availability of data
- Working to bring together national level policy-makers with city governments to discuss the needs and improve the landscape within which city-level action can take place
- Lean on international organization/efforts (SETAC/GI-REC) to continue to serve as a knowledge bridge, helping to share and disseminate information, through:
  - An open database of MFA resources
  - work on definitions on resources indicators and guiding principles and practices

Next Steps and Conclusion

Throughout the day it was clear that there is a lot of activity, knowledge, and support for life cycle thinking (LCT) within the region. During the conclusion of the workshop participants were asked to identify missing topics or aspects that might benefit from additional emphasis. Participants were then asked to identify concrete next steps and/or suggested subsequent activities.

Topics that would benefit from additional attention/emphasis:

- Role of small and medium-sized enterprises (SMEs), how best to provide access to LCT tools, and ensure that SMEs are fully on-board as stakeholders
- Emphasize the role of collaboration between educational institutions (including technical institutions), industry, and the public sector
- Better knowledge sharing through case studies, training manuals, and development of the business case for LCT

Next steps

Networking and cooperation

1. Even if you are alone in your office or organization, you should transmit the long-term view that is shared among those in the field.
2. Facilitate a network connecting experts and practitioners
3. Promote public-private partnerships to enhance cooperation and engagement with private sector in support of LCT in cities
Methodologies and data
4. Report back (at conference or webinar) on existing modelling work for cities in Mexico where seven universities have been/are working on LCA/LCT in building materials hosted by CADIS.
5. Promote internationally agreed principles and practices for LCT in cities with support of the UNEP IRP, GI-REC and UNEP/SETAC.
6. Work towards open source tools and repository of data to apply LCT in cities to be possibly hosted by UNEP.

Capacity building and research
7. Development on a university course on LCA/LCT methodologies and concrete applications in cities through case studies.
8. Engage students for research on these topics related to life cycle approaches in cities and host workshops for them to present their findings.
9. Seek funding to continue research, to stay connected with other researchers, we are all going in the same direction and by networking and sharing we will go much faster. This is to be supported by UNEP.
10. Educate and outreach to the private sector, possibly through running short courses focused on private sector, general market, 1 day course for people in private sector or local government to get a broader debate and discussion started – possibly via business schools executive development programme.
11. Education and training for political decision-makers and policy staff at sub-national and national level.

Communication
12. Promote communication on this topic at two levels, within the life cycle community and then outside communication on life cycle (e.g. to city managers, etc.)
13. Capacity building and research.
14. Develop a business case (including not only the social and environmental but the economic benefits) that we can sell, regional focused, find examples at city-level, identify business cases that show benefits in several areas (economic, social, etc.).

At the conclusion of the workshop it was decided that the International Resource Panel, World Resources Forum, UNEP/SETAC LC Initiative, and GI-REC initiatives will continue to communicate and share efforts. Furthermore, other organizations that could potentially be part of the collaboration should be identified.
SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES IN THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

Workshop organised by IRP, UNEP

Session chair: María José Baptista, UNEP

Speakers
María José Baptista (UNEP, France), Maria Amélia Enríquez (former IRP, Brazil), Walter Pengue (former IRP, Argentina).

Introduction
Progress towards sustainable development will ultimately depend on the responsible management of the planet’s natural resources, which underpin the well-being of humanity, the environment, as well as of the economy.

Progress in terms of economic and social development over the last century has been largely achieved through intensive, inefficient and unsustainable use of our planet’s finite resources. As highlighted by the International Resource Panel, during the 20th century the annual extraction of construction minerals grew by a factor of 34, ores and minerals by a factor of 27, fossil fuels by a factor of 12, biomass by a factor of 3.6, and total material extraction by a factor of about eight, while GDP rose 23-fold. Ores, minerals, hydrocarbons and biomass are currently being extracted at a rate of 60 billion metric tons every year (a rise from seven billion tons in 1900), to keep us fed, clothed, housed, mobile, entertained and in touch. As economies expand and populations grow, this is set to increase to 140 billion tons annually by 2050 at current levels of consumption.

Natural capital is essential for human life, economic and social development and its sustainability. It accounts for a quarter of wealth created in the poorest countries. A reduction in stocks of natural capital and flow of ecosystems services negatively affects the well-being of the poor disproportionately. Therefore, while global GDP has been increasing over time, so have environmental degradation and social inequalities. While global GDP reached US$ 58 trillion in 2009, almost 80% of humanity continued to live on less than US$10 a day and the share of global wealth for the bottom 40% of the population remains less than 5 per cent. Poverty, in turn, can have a negative impact on the environment as populations do not have the means or choice to conserve resources, or use them in the most sustainable way.

The 2030 Agenda for Sustainable Development, a historic global commitment to a world free of poverty, is a global confirmation of the criticality of natural resources for sustainable development. The sustainable and efficient management of natural resources is now an imperative for the achievement of at least 12 out of the 17 United Nations Sustainable Development Goals (SDGs). Restoring and maintaining the health of the natural resource base is not only needed to adequately feed current and projected populations, but to provide a better quality of life in the years to come.
Experience from the Millennium Development Goals demonstrates that there is a need for science-based decisions. Any targets and indicators used to set boundaries and monitor progress will need to be scientifically sound, methodologically robust, yet policy relevant in order to trigger political action. They should be forward-looking, taking into account the needs of the present generation while also considering sustainability for future generations, promoting action in the short-term while creating a sustainable vision for the long-term. At the same time, they should be dynamic taking into account assumptions and projections of trends, for example on population growth and demographic change, urbanization trends, internal and international migration, economic growth, resource availability and environmental trends, as well as technological improvements and innovation.

Objective, format and target audience
The workshop introduced the audience to some of the findings from the above mentioned IRP think pieces and explored some of the potential pathways for Latin American and Caribbean countries to improve the management of its natural capital and achieve the SDGs, in particular SDG 8 target related to decoupling economic growth from environmental degradation and sustainable consumption and production. The event consisted of keynote presentations followed by Q&A sessions with interested participants from the academic, civil society and public sector working in sustainable development.

Key messages
- Science is critical for the achievement of the sustainable development goals (SDGs) and the 2030 Agenda as it builds the foundation for new approaches and solutions to effectively tackle future global challenges. It provides answers that can be tested and reproduced and allows conclusive decision-making processes and effective impact assessments. It also helps us understand the trade-offs of implementing measures towards the achievement of one or more SDGs. The International Resource Panel helps policymakers understand the complex interlinkages between natural resource related targets set by the 2030 Agenda for Sustainable Development.
- As shown by the IRP, the confluence of current trends in population growth, changing lifestyles, urbanization and economic activity are increasing pressures on natural resources and the environment. Signs of escalating and compounded stresses are evident at global, national and local levels and are reflected in local and regional scarcities of vital resources like water, widespread land degradation and the exceeding of critical global thresholds leading to
the disruption of Earth System processes (such as climate regulation and the nitrogen cycle). Combined with, and leading to, rising inequalities and social conflict, the by-products and side effects of current development trajectories could well, in the not too distant future, create insurmountable obstacles to the international community’s efforts at improving human well-being, and even lead to cascading risks of losing the development gains achieved so far.

- The SDGs are the expression of the global community’s determination to achieve increasing living standards for all, including the eradication of poverty, while maintaining a habitable environment. In the past, many socio-economic and environmental objectives have been experienced as trade-offs. The adoption of the SDGs represents the global community’s determination to break with this historical experience and achieve synergies between the objectives, rather than trade-offs. However, the risk of trade-offs remains. Avoiding this risk, and achieving the SDGs synergistically, will require concerted policy action at multiple levels (global, regional, national and local). These policies need to anticipate and resolve possible resource conflicts and enhance co-benefits among the SDGs. They need to generate a new set of resource management strategies that address the entire ensemble of SDGs, avoiding zero-sum outcomes and leading to net positive results across the SDGs as a whole.

- Decoupling economic growth from environmental degradation was confirmed by the global community as a critical strategy for sustainable development, as specifically recognized in goal 8.4 of the Sustainable Development Goals.

- For LAC, a key question is how to grow and improve welfare, protect its great natural resource endowment while reducing poverty and inequality. Changes for resource and impact decoupling in the region could be made through (a) international targets established in global binding agreements and protocols of environmental certification (e.g., efficiency energy programs in Chile, climate change programs in Brazil, eco-efficiency on farms in Paraguay); (b) better market integration (e.g., GHG reduction requirements in loans); and (c) social technologies of low cost and high replicability (e.g., solar water).
SHARING SUSTAINABLE BUSINESS CASES: TOOLS AND PRACTICAL EXPERIENCES ON RESOURCE EFFICIENT AND CLEANER PRODUCTION (RECP)

Workshop organised by RECPnet, LAC Chapter

Session chair: Marcos Alegre, CER

Speakers
Sylvia Aguilar (CEGESTI, Costa Rica), Marcos Alegre (CER, Peru), César Barahona (UNIDO, Austria), Abelardo Flores (CMP, Mexico), Ronald Fonseca (CPML, Nicaragua), Sergio Ponce (CPLB, Mexico Bajío), Yolanda Salazar De Tobar (CNPML, El Salvador).

Objective, format and questions
The Global Network for Resource Efficient and Cleaner Production (RECPnet), its Latin American and the Caribbean Chapter and initiatives were introduced to the audience. Successful business cases in the Latin American and Caribbean region were showcased by several members of the RECPnet and related opportunities and advantages in the region were portrayed. On the other hand, the needs and weaknesses regarding technical capacities, policy development, dissemination of information were highlighted. As stated by the RECPnet members, these issues should be approached in future strategies, as well as implemented in the region in order to facilitate its sustainable development.

The following questions were mainly addressed during the workshop:
1. What are the main motivations that private enterprises have to implement RECP?
2. What lessons learned can we underline in order to connect private business expectations with resource efficient and cleaner production?
Key Messages

- The exchange of successful business cases between southern regions should be enhanced through suitable platforms, such as the Knowledge Management (KM) Platform or the RECPnet. Such platforms allow the gathering and dissemination of experiences and lessons learned in diverse topics related to resource efficient and cleaner production.

- Furthermore, this exchange allows the validation of crosscutting concepts and methodologies that should be considered in every sustainable development strategy for the industry, such as eco-innovation, life cycle thinking, resource efficiency and eco-design.

- National Cleaner Production Centers (NCPC) are a technical source for the implementation of Sustainable Consumption and Production policies, particularly for SMEs and governments.

- Dissemination initiatives should be put in place, emphasizing best practices of NCPCs, companies and governments and thereby boosting their reproduction and escalation at national and regional level.
This year, five topics were selected for the scientific sessions:

- Sustainable business and financing
- Bioeconomy – Priority Resources for cities
- Sustainable lifestyles and education
- Resource efficiency policies for sustainable cities and lifestyles
- Sustainable and inclusive cities and buildings

About 130 abstracts from 14 countries were submitted, 33 of which were finally accepted by the Scientific Committee for oral presentation during one of the 5 scientific sessions organized in San Jose. These gave place to highly interesting and inspiring speeches and very stimulating discussions with the public. Five of them have been particularly appreciated and were prized by the Scientific Session Chairs – Dr. Sonia Valdivia (WRF, Switzerland) and Prof. José Luis López (ALCALA, Costa Rica) – with the support of the public. These were:

- Creación de valor a partir de la variable ambiental, presented by Lorena del Pilar Muñoz (Universidad Adolfo Ibañez, Chile) in the “Sustainable business and financing” session
- Estrategias aplicadas en el cierre de 30 vertederos en Perú, presented by Alberto Huiman Cruz (Peru Waste Innovation S.A.C., Peru) in the “Bioeconomy – Priority Resources for cities” session
- Smart lifestyle choices for urban living: more dematerialization, no more waste, presented by Dr. Sanjeevan Bajaj (Federation of Indian Chambers of Commerce and Industry, India) in the “Sustainable lifestyles and education” session
- Efectos de la innovación en los productores orgánicos de la región Arequipa, 2015, presented by Prof. Anatolia Hortencia Hinojosa Pérez (Universidad Católica San Pablo, Peru) in the “Resource efficiency policies for sustainable cities and lifestyles” session
- Condominio La Esperanza: Sostenibilidad por medio de un diseño innovador, presented by Minor Rodríguez (Fundación Promotora de Vivienda, Costa Rica) in the “Sustainable and inclusive cities and buildings” session

These and other WRF LAC & ISBC 2016 presentations can be consulted on the World Resources Forum website. In addition, a selection of manuscripts will be published in the course of 2016.

The Scientific Committee in charge of the review of abstracts submission, headed by Dr. Valdivia and Prof. López, consisted of several experts from all around the world. We would like to thank them all once again for their great work!
4 PARTICIPANT SURVEY

Very good satisfaction with WRF-LAC & ISBC 2016, results of participant survey show

For the 6th consecutive year, the WRF carried out a survey after the conference, in coordination with GBC-CR and UNEP. 33 people of the about 266 participants replied (response rate: 12%). Results show that the event met the expectations (or more) of a big majority of respondents (88%). For 45% of the respondents the event was above or significantly above their expectations. Almost all aspects of the conference have been very highly appreciated, with a very high satisfaction regarding social events, the quality of the plenary sessions and of the workshops. Open questions also praise the very good networking experience. Among the five topics of the conference, ‘Sustainable and inclusive cities and buildings’ gained the most attention (64% of the respondents found it the most interesting), followed by ‘Resource efficiency policies for sustainable cities and lifestyles’ (46%) and ‘Sustainable lifestyles and education’ (40%). Participants were quite heterogeneous, with 40% coming from the private sector, 18% from the scientific sector, 15% respectively from the civil society and from other organizations (mainly NGOs), and 12% from governments. Even if responses are very positive; they show that there is still room for improvement. The comments will be considered by the Organising Committee to further improve future events. We will be pleased to get your feedback at any point in time. Please check the co-organisers’ official websites or send us an email at info@wrforum.org.
Please indicate your overall impression with this conference (Answered question: 33)

Which key topics did you find the most interesting? (Answered question: 33)

Which stakeholder group would you like to see more represented in future conferences organised by UNEP, WRF or GBC-CR? (Answered question: 33)
APPENDICES

APPENDIX A: CONGRESS PROGRAMME

Tuesday May 17 – Innovation for Sustainable Resource Management

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7.30</td>
<td>Registration</td>
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<tr>
<td>8.30</td>
<td>High level opening: innovation in cities</td>
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<td></td>
<td>• Xaver Edelmann, WRF</td>
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<td></td>
<td>• Leo Heileman, UNEP Regional Office for Latin America and the Caribbean (ROLAC)</td>
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<td></td>
<td>• Gilberto Monge, Mayor of the canton of Mora, Costa Rica</td>
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<td>• Ana Quiros, GBC-CR</td>
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<tr>
<td>9.10</td>
<td>Workshop Parade moderated by Mathias Schluep, WRF</td>
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<td>10.10</td>
<td>Coffee break</td>
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<tr>
<td>10.30</td>
<td>WS 1: Sustainable Management of Natural Resources in the 2030 Agenda for Sustainable Development</td>
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<td>WS 2: Urban Planning for Sustainable Cities</td>
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<td>WS 3: Promoting Change Transparency in Building and Infrastructure: evaluating systems for private and public building</td>
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<td>WS 4: Communication for Sustainable Lifestyles</td>
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<tr>
<td></td>
<td>SUSHI (Sustainable Social Housing) Session [workshop by invitation only]</td>
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<tr>
<td>12.30</td>
<td>Lunch break</td>
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<tr>
<td>13.30</td>
<td>Plenary: The imperative of sustainable resource management in the Agenda 2030 moderated by Leo Heileman, UNEP ROLAC and Roberto Arntavia, VIVA Trust</td>
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<td></td>
<td>• Rosendo Pujol, Minister of Housing and Human Settlements of Costa Rica</td>
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<td>• Louise Hutchins, Advisor to the Minister of the Environment of Ecuador</td>
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<td>• Maria Amélia Enríquez, former IRP Member</td>
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<td>• Donna King, Environmental Education Officer, Min. of Environment and Drainage of Barbados</td>
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<td></td>
<td>• Florencia Walger, Coordinator Environment Unit, Industry Secretariat, Ministry of Production of Argentina</td>
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</tbody>
</table>
### 15.50 Coffee break

### 16.10

**WS 5: Alternative Energies: modelling and status for Costa Rica & LAC**

**WS 6: Sustainable Construction: systems, efficiency & materials**

Conference Cinema

Scientific Session: Sustainable Business and Financing

### 17.40

**Plenary: Sustainable Infrastructure – Agreement launch GIB & GBC-CR**

- Sebastián Urbina, Vice Minsiter of Public Works and Transport of Costa Rica
- Hans-Peter Egler, Global Infrastructure Basel (GIB) Foundation
- Ana Quirós, GBC-CR

### 20.10 Urban Gastronomic Tour (Social Program)

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### Wednesday May 18 – Building Resource Efficient and Inclusive Cities

### 7.30 Registration

### 8.30

**Plenary: From COP 21 to Habitat III – Towards low carbon, resource efficient & sustainable cities** moderated by Sonia Valdivia, WRF

- Hans-Peter Egler, GIB Foundation
- Martina Otto, UNEP
- Kristtian Rada, International Finance Corporation (IFC) – World Bank Group
- Mauricio Chacón, Central American Bank for Economic Integration (BCIE)
- Jennifer Layke, World Resources Institute (WRI)

### 10.30 Coffee break

### 10.50

**WS 5: Understanding the Metabolism of Cities: Opportunities for City-level Decoupling**

**WS 6: Mainstreaming Waterfootprinting in Latin America**

**WS 7: The Challenge of Sustainable Construction in Relation to Electrical Polution and Sustainable Planning in Cities**

Scientific Session: Bioeconomy – Priority Resources for Cities

### 12.50 Lunch break
## 14.10
**WS 8:** Turning Waste into Resource for Development: Roadmap for Latin America

**WS 9:** Public Space: shifting paradigm

**WS 10:** Building, Design and Work Place Lifestyle

**WS 11:** The 10YFP: Promoting Sustainable Consumption and Production for Sustainable Cities and Lifestyles

## 16.10
Coffee break

## 16.30
**WS 12:** Climate Change: design, evolution for cities, infrastructure and buildings

**WS 13:** Sharing Sustainable Business Cases: tools & practical experiences on RECP

**WS 14:** Building on Performance: cities efficiency accelerator

**Scientific Session:** Sustainable Lifestyles and Education

## 18.00
**Plenary:** Social housing, communities & city development: priority actions moderated by Martina Otto, UNEP

- Gilberto Monge, Mayor of the canton of Mora, Costa Rica
- Pliny Fisk III, Center for Maximum Potential Building Systems (CMPBS)
- Michelle Malanca, former WGBB

## 20.20
Gala Dinner

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### Thursday May 19 – Mainstreaming Sustainable Lifestyles in Cities: the road ahead to Quito

## 7.30
Registration

## 8.30
**Plenary:** Empowering and enabling sustainable lifestyles in cities moderated by Adriana Zacarías, UNEP

- Steve Aronson, Demain Foundation
- Kenneth Ochoa, Universidad del Bosque
- Astrid Hollander, United Nations Educational, Scientific and Cultural Organization (UNESCO)
- Irene Cañas, Vice Minister of Energy of Costa Rica
- Lewis Akenji, Institute for Global Environmental Strategies (IGES)

## 10.30
Coffee break
10.50 WS 15: Passive Design, Materials, Site Improvement for Community Living
WS 16: Efficient and Affordable Housing, Sustainable City Engine: certification, financing & development
WS 17: Understanding Sustainable Lifestyles: some visions from LAC
Scientific Session: Ressource Efficiency Policies for Sustainable Cities and Lifestyles

12.50 Lunch break

16.30 WS 18: City Sustainability: densification, resource efficiency, inclusiveness & tall building’s experience
WS 19: Empowering Consumers and Communities – EPDs, LCA communities, smart cities
WS 20: Ecological Footprint and Lifestyles Archetypes
Scientific Session: Sustainable and Inclusive Cities and Buildings

16.10 Coffee break

16.30 Plenary: Chairperson’s summary and closing
- Adriana Zacarías, UNEP
- Xaver Edelmann, WRF
- Kari Herlevi, Finnish Innovation Fund SITRA
- Ana Quirós, GBC-CR
- Announcements & Invitations

18.00 Green Drinks

Friday May 20 – Trainings and Back-to-back Meetings
- SuRe®: Assessing sustainable infrastructure to promote efficient use of resources and social responsibility
- Excellence in Design for Greater Efficiencies (EDGE): Basic Concepts
- Life Cycle Thinking – Urban Metabolism
- Leadership in Energy & Environmental Design (LEED) Training
- Creating Green Districts and Cities: tools and solutions
APPENDIX B: SCIENTIFIC SESSIONS PROGRAMME

Tuesday May 17 (16:10 – 17:40)

Sustainable Business and Financing

Session Chair(s): Dr. Sonia Valdivia, World Resources Forum – Switzerland
Mr. Carlos Naranjo, GAIA – Colombia

- Transparency in Management: a systems approach for effective resource use towards sustainable cities in Latin America
  Ana Quiros, Jose Bolivar, Aitor Llodio, Mario Quiros – Costa Rica
- Infrastructure – A Crucial Key for Resource Efficiency, Sustainability and Resilience
  Hans-Peter Egler, Raul Frazao, Silvio Leonardi – Switzerland
- Entrepreneurial Support for E-Waste Recyclers
  Elisabeth Herbeck, Markus Spitzbart, Mathias Schluep – Austria/Switzerland
- Fondo verde y tecnologías limpias en negocios sostenibles
  Ana Georgina Terrazos, Andrea Del Carpio, Andrea Coloma. Presented by Marcos Alegre – Peru
- Creación de valor a partir de la variable ambiental
  Lorena del Pilar Muñoz – Chile

Wednesday May 18 (10:50 – 12:50)

Bioeconomy: Priority Resources for Cities

Session Chair(s): Dr. Sanjeevan Bajaj, FICCI – India
Prof. Jairo Chacón, Escuela Colombiana de Ingeniería Julio Garavito – Colombia

- Incorporating Lessons from Nature into Manmade Infrastructure
  Neil Myers, Andres Prera – United States
- Contributing to the ISO Guidance Principles for Sustainable Metals Recycling in Latin America
  Sonia Valdivia, Mathias Schluep, Maria Sureda, Rolf Widmer, Ruweyda Stillhart – Switzerland
- Estrategias aplicadas en el cierre de 30 vertederos en Perú
  Alberto Huiman Cruz – Peru
- La sostenibilidad de la edificación de altura en el contexto urbano costarricense
  Victor Mantero – Costa Rica
- Quality Infrastructure and Green Building: exploring interlinkages for a Greener Economy
  Ulrich Harmes-Liedtke, Anna Kruip, Andrea San Gil – Germany/Costa Rica

Stand-ups: 3-min presentations

- Producción sostenible basados en análisis de ciclo de vida de productos; El caso de FLOREX en Costa Rica
  Silvia Elena Chaves Quesada – Costa Rica
- Proposal of Sustainable Construction from the Implementation of New Materials to Improve the Structural Design of Housing in the Town of Bete, Chocó, Colombia
  Daniela Gutiérrez Casado, Paola Andrea Pérez Lora, José Francisco Ibla Gordillo – Colombia
Wednesday May 18 (16:30 – 18:00)

Sustainable Lifestyles and Education

Session Chair(s): Dr. Rita Schenck, IERE – United States
Mr. Mario Quirós, ALCALA – Costa Rica

- Smart Lifestyle Choices for Urban Living: More Dematerialization, No More Waste
  Sanjeevan Bajaj – India
- Parque La Libertad: Polo de desarrollo para el impulso de una ciudad sostenible
  Lidia Noches González – Costa Rica
- Ecological Footprints and Lifestyle Archetypes: Exploring dimensions of consumption and the transformation needed to achieve urban sustainability
  Jennie Moore – Canada
- El estacionamiento como una herramienta para la planificación urbana
  Jose Cordero-Ortiz, Emilia Umaña Matamoros – Costa Rica

Stand-ups: 3-min presentations
- Recycling and Community Center Chira
  Marije van Lidth de Jeude, Oliver Schütte, Grethel Ulate – Costa Rica
- Popular School for Urbanism
  Marije van Lidth de Jeude, Oliver Schütte – Costa Rica

Thursday May 19 (10:50 – 12:50)

Resource Efficiency Policies for Sustainable Cities and Lifestyles

Session Chair(s): Simone Rufener, FOEN – Switzerland
Dr. Nydia Suppen, CADIS – Mexico

- Improving Conditions for Distributed Energy in Costa Rica: a case study for community energy
  Esteban Bermúdez, Andrea San Gil, Raquel Salazar, Bjørn Utgård – Costa Rica
- Sustainable Cities
  Marije van Lidth de Jeude, Oliver Schütte – Costa Rica
- El nuevo estándar WELL: Diseño del espacio de trabajo y bienestar
  Carolina Roa Muñoz, Victoria Gilbert, Stefan Kiss, Gabor Nagy, Mike O’Neill – Colombia

Stand-ups: 3-min presentations
- Efectos de la innovación en los productores orgánicos de la región Arequipa, 2015
  Anatolia Hortencia Hinojosa Pérez – Peru
- The Responsible Hotel
  John Porras Porras, Álvaro Salazar, Olver Vega, Alexander Gonzalez – Costa Rica
Thursday May 19 (14:10 – 16:10)

Sustainable Business and Financing

Session Chair(s): Prof. Arnold Tukker, CML Leiden University – The Netherlands  
Prof. José Luis López, GBC-CR – Costa Rica

- Revitalización del centro histórico de San José circuitos de cultura, arquitectura y habitabilidad  
  Tomás Martínez Baldares, Dayana Gonzalez – Costa Rica
- Residencias universitarias auto sostenibles en Costa Rica  
  Fernando Castro – Costa Rica
- Aproximación al sector vivienda y construcción informal en el distrito de Villa El Salvador en Lima, Perú  
  Jon Bickel, Adrian Montalvo – Peru
- No Footprint House (NFH)  
  Oliver Schütte – Costa Rica
- Condominio La Esperanza: Sostenibilidad Ambiental por medio de un diseño innovador  
  Minor Rodríguez – Costa Rica
- Periurban Agriculture: an agroproductive shield in pro of food and health security approach for towns and cities  
  Walter Alberto Pengue – Argentina
APPENDIX C: COMMITTEES

SCIENTIFIC COMMITTEE

Dr. Sonia Valdivia, Co-Chair  
World Resources Forum  
– Switzerland

Prof. José Luis López, Co-Chair  
Association for Life Cycle Assessment in Latin America (ALCALA)  
– Costa Rica

Julio Alvarado  
ENVIRO Arquitectura Sostenible  
– Costa Rica

Diego Arevalo  
Consultant in Water Management and Water Footprint – Colombia

Dr. Allan Astrup Jensen  
Consultant in Life Cycle Assessment  
– Denmark

Tiago Emmanuel Braga  
Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT)  
– Brasil

Francesc Castells  
Universitat Rovira i Virgili – Spain

Dr. Paola Castrillo  
VERTECH Group – France

Prof. Jairo Raúl Chacón  
Escuela Colombiana de Ingeniería  
Julio Garavito – Colombia

Prof. Martin Charter  
Centre for Sustainable Design – UK

Cristian Emhart  
Fundación Chile – Chile

Arch. Javier Esquivel  
Grupo AICA & Cámara de Consultores en Arquitectura e Ingeniería  
– Costa Rica

Prof. Fausto Freire  
Universidade de Coimbra  
– Portugal

Prof. Rosario Gómez  
Universidad del Pacífico – Peru
SCIENTIFIC COMMITTEE

Prof. Patricia Güereca
Universidad Nacional Autónoma de México – Mexico

Prof. Atsushi Inaba
Kogakuin University – Japan

Prof. Alicia Jiménez
University for Peace – Costa Rica

Prof. Ramzy Kahhat
Pontificia Universidad Católica del Perú – Peru

Prof. Tómas Martínez
Technological Institute of Costa Rica (ITCR) / San José Historical Centre Program – Costa Rica

Peter Moonen
Wood WORKS & Canadian Wood Council – Canada

Carlos Naranjo
GAIA Servicios Ambientales – Colombia

Prof. Claudia A. Peña
ADDERE Research and Technology and Latin American Hub, International EPD System – Chile

Prof. Luis Diego Quirós
Veritas University – Costa Rica

Mario Quirós
Association for Life Cycle Assessment in Latin America (ALCALA) – Costa Rica

Prof. Maria Isabel Quispe
Pontificia Universidad Católica del Perú – Peru

Prof. Arne Remmen
Aalborg University – Denmark

Prof. Joan Rieradevall i Pons
Institute of Environmental Science and Technology Universitat Autònoma de Barcelona CTA – Spain

Alvaro Rojas
Foro Arquitectos /Mundaneum International Reunion – Costa Rica
Scientific Committee

Prof. Elena Regla Rosa
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