Cities today house more than half of the population and produce 70-80% of global GDP, energy consumption, CO2 emissions, and solid waste. These startling percentages are increasing as the world continues to urbanize, but more importantly, they point to increasing connectivity and interdependence. Because virtually all of a city’s resources and waste travel a great distance, cities cannot be understood as separate entities, or use balance-sheets limited to activities within their own boundaries. Politics, immigration, finances, food, energy or garbage – let alone little things like air and water – everything that happens in a city depends on the vast global systems of social and natural flows. Even (and especially) ideas are not contained within city boundaries. Adding all of this together would suggest that any meaningful solutions to climate change, biodiversity, pollution, or waste must happen in our cities to have any credibility or real teeth.

One way cities can manifest solutions to some of these pressing environmental challenges is to reinvent their relationship to the world’s forests. Our extensive work with both cities and forests shows that current connections between these two global heavyweights are typically competitive, not cooperative – usually distant, opaque, and based on a one-way flow of goods and services. But new projects and ideas, growing public awareness and cutting-edge research are offering blueprints for creative relationships that can be interdependent and intimate; virtuous cycles where mutual needs and resources are shared for the benefit of cities and forests, people and planet.

The City-Forest Nexus

Can making things out of wood help connect two of our greatest assets?

WRITER: SCOTT FRANCISCO
The ‘raw materials’ for mutual benefit between cities and forests abound: Cities are creative centers of dense human activity, ideas and consumption. Forests create oxygen, transform CO2 into biomass and cool the planet, representing one third of the total climate change solution. Cities are where the majority of people live. Forests provide a home for most of the earth’s biodiversity. Cities need tremendous amounts of food, materials and energy every day. Forests grow and replenish continuously, providing stable soils and climate for agriculture, building materials, food, water and medicines. Cities celebrate beauty, ideas and knowledge. Forests are treasure chests of wild genetic resources, beauty and mystery to be discovered by future generations.

Ideas for proactive relationships between cities and forests include forest-friendly coffees and plant products that support local forest economies, along with sourcing guidelines for commodities that may threaten rainforests. There are educational and tourism programs that connect children from urban and rural areas, investments in watersheds that provide cities a reliable supply of clean water, and pension funds that invest in forest plantations. Added to this list of opportunities is selective, sustainable timber production, guided by local community leadership. Research and case studies have shown that by combining advanced forest management techniques, transparent monitoring, and deep local knowledge of forests, communities are able to generate income, comparable to clearing land for agriculture, while keeping forests intact.

Building cities out of wood

Sustainably harvesting wood in order to protect forests opens a link to one of the most advanced concepts in urban design and architecture called “wood urbanism”: literally building our cities with wood, from pot scrappers to skyscrapers. Over the past decade the concept of tall wood buildings using “mass timber” frames and cross-laminated timber (CLT) panels has developed with much excitement and investment: a strategy for healthy, fire-safe urban buildings that can help to reverse climate change. The argument is that by replacing our most CO2-intensive building materials (like concrete, steel and aluminum) with a material that naturally sequesters carbon rather than emits it, we can reduce the CO2 entering the atmosphere by as much as 30% annually – an amount equivalent to the world’s entire transportation sector. This calculation assumes we can build 50% of the world’s new urban buildings with wood, which prominent architects, engineers and foresters assert is possible today. And this is no fantasy. Wood is currently being used to build hundreds of safe, healthy and beautiful urban buildings at costs competitive with concrete and steel. Brock Commons, an eighteen-story student residence recently completed on the University of British Columbia campus in Vancouver, is the world’s tallest wood building. To win the contract, architects and engineers had to compete with conventional construction materials, and won the bid based on price and performance by a slim margin. Future-focused developers see substantial cost advantages on the horizon as fossil fuel costs inevitably skyrocket and as carbon pricing is implemented.

Don’t forget the forest

With evidence that healthy, carbon-sequestering wood buildings are possible, desirable and affordable, the question about their impact on the world’s forests has yet to be fully answered. On the quantitative “supply-side”, research by Dr. Chad Oliver at Yale University’s School of Forestry shows that global forests already generate more than enough wood to build 50% of all urban construction – production levels that can be sustained indefinitely with good forest management and investment in supply chain systems. But even this assurance does not necessarily get us to an “inter-dependent and intimate” relationship between cities and forests.
With most technical problems solved, the greater challenge is to link the charisma and “in-your-face” solidity of big wood buildings to their forests of origin, a mental and emotional connection that validates the perpetual function and purpose of forests as social and natural systems. Establishing this link is key to reversing the underlying drivers of deforestation, which begin with a perceived lack of value of forests. This undervaluing is due in large part to how urbanization pushes forests into the cognitive distance, and global capitalism sees forests as “inefficient” in terms of quick return on investment. When urbanization and global capitalism get together, we get our perfect storm of global deforestation: 44,000 Ha lost per day. The good news is that to the degree cities can promote distance and ambivalence towards the natural environment, then deforestation is also a problem that cities can reverse.

Cities are the great global consumers by sheer volume, eating up 75% of global resources. And they are also where the vast majority of consumer tastes, ideas and systems are invented, tested and formed. When designers in Paris, New York, Shanghai or Lagos decide it’s time again to wear bell bottoms or high waisted pants, the world will follow. The same applies to other commodities like food, technology, transport and housing. If it is “cool” to live in an industrial loft today it is because of the urban taste-making machine of the 1990s. If it is cool to live in a wood loft by 2020, we can credit the same. And a loft building made of wood sourced from a partner forest managed by a local community? Now we have something to talk about! And a more interesting story than the return of bell bottoms.

The quality and content of these stories is critical. We can’t save the world’s forests simply by cutting down trees to make buildings. It is important to acknowledge that some forests ought never to see a chainsaw because of their special ecological and social contribu tion or history. We must be selective about which forests are suitable to produce wood sustainably, and always define this from within the particular forest context. To do this we will have to get more comfortable with the chainsaw as a surgical tool that, in careful hands, can help forests live a long and productive coexistence. The community of Uaxactun, Guatemala has demonstrated how effective this strategy can be in the rainforest context. After twenty years of active forest management they have maintained and increased intact forest cover, compared the “protected areas” around them that are often ravaged by poachers, drug runners, fires and opportunist cattle grazing. And they have done this while supporting the community with a range of forest products including many species of certified sustainable wood. Recently this wood was used to reconstruct part of the famous Coney Island Boardwalk in New York City that was ravaged by Hurricane Sandy. Tourists can now make the connection between a faraway forest that they’ve helped conserve to slow climate change, and the dangerous impacts of “business as usual”. All right under their feet.

Things get most interesting when this kind of selectively harvested wood used in city infrastructure can become a “souvenir”, part of a larger romance with forests that helps change the culture, knowledge and values regarding forests’ importance. The visible presence of wood in the city, can be branded (sometimes literally with a branding-iron) and hitched to the ideas, value, and location of a perpetual forest, akin to a marketing agency flogging a new product by associating with a celebrity’s face or lifestyle. In this case the future of the planet is at stake. Wood used this way is more than a carbon sink. It becomes a symbol, a vehicle and a mental and emotional connection to how urbanization pushes forests into the cognitive distance, and global capitalism sees forests as “inefficient” in terms of quick return on investment. When urbanization and global capitalism get together, we get our perfect storm of global deforestation: 44,000 Ha lost per day. The good news is that to the degree cities can promote distance and ambivalence towards the natural environment, then deforestation is also a problem that cities can reverse.

Buildings are big. They deal with a huge volume of carbon, either as emitters or as sequesters, and the wood used to make them is mostly sourced from northern coniferous forests in Canada, Europe and the United States. To unlock the full potential of the wood/city/forest value proposition, however, city planners, policy makers and consumers will need to embrace the diverse ecosystem of infrastructures that can be made of wood, from urban-scale bridges to boardwalks, benches, boats, bicycles and breadboards.

Each of these “parts of a city” is an opportunity to avoid using a high CO2 emitting material like plastic, aluminum or steel, and for a new forest-positive story to be written. And the variety of wood needed for these infrastructures (hard, soft, heavy, light, durable flexible etc.) means the wood can be sourced from more diverse forests and communities around the world, including tropical forests. If this sourcing is done right – transparent, legal and part of a certificed perpetual forest plan – it can capture the imagination of city dwellers while funneling trillions of dollars into good forest stewardship in the coming decade.

Over the past 17 years, Peter Pinchot has worked closely with community members in the threatened tropical forests of Ecuador. Their goal has been to ensure the forest avoids destruction, and pays for itself through sustainably-sourced wood products offered to the global market. After years of testing, setbacks, and innovation, their co-owned Whole Forest company now supplies unique wood products like...
counterparts, flooring, tables (and cutting boards) that showcase the many species found in these forests. This multidimensional partnership protects vast areas of tropical forest by combining ultra-low-impact extraction, local employment (that depends on healthy forests) and a market willing to pay for a quality product branded with a meaningful narrative. Recently, Whole Forest has been able to offer carbon offsets with solid evidence that their products actually save forests from degradation and destruction.

This model, while challenging, can be replicated and scaled-up to the global demand for wood products in our cities. Imagine a 25-story building made entirely from different wood species, sourced from forests that each maintained a balance of consumption and regeneration, economic prosperity and cultural vitality. With thoughtful urban policies to increase transparency and demand for these forest products, the benefits can be distributed all the way back to small landholders, indigenous peoples, and workers at all levels in the supply chain, generating good employment and improving livelihoods. These are the people at the front-lines of deforestation or conservation, and they are often marginalized observers of urbanization with options limited to moving to the cities themselves, or continued liquidation of forests for subsistence. By involving them in an exciting global vision that connects urban innovation, good forest management and well-paid, hands-on work in the forest, these people can become genuine partners in the city-forest alliance.

15. Whole Forest supplies unique wood products like countertops, flooring, tables (and cutting boards) that showcase the many species found in threatened tropical forests of Ecuador.
16. This multidimensional partnership protects vast areas of tropical forest by combining ultra-low-impact extraction, local employment (that depends on healthy forests) and a market willing to pay for a quality product branded with a meaningful narrative.

Building our cities with wood to fight climate change and improve the built environment is a beautiful and realistic vision that can shift the attention of urban governments and culture towards the life-giving importance and romance of the world’s forests. Thriving and restored forests are one of the mightiest chess pieces in decarbonizing our atmosphere and protecting biodiversity. Forests and wood offer a triple advantage to climate change: Not converting a forest to farmland or pasture prevents massive amounts of CO₂ from entering the atmosphere; planting trees and restoring forests (two important but sometimes very different things) can suck enormous amounts of CO₂ from the atmosphere; and using wood in long-term infrastructure locks in CO₂ pulled from the atmosphere, while allowing new trees to grow in the forest to continue the cycle. Even reducing global deforestation by half, and using wood for 50% of global construction would stop 13 billion tons of CO₂ going to the atmosphere every year (35% of total emissions) bringing us much closer to the urgent 2 degree mandate of the Paris Agreement.

Can cities rewrite the global story?

To leverage the wood-city-forest nexus towards these ambitious goals, we will need creative urban policies and projects that favor sustainable wood, assisted by markets, regulation, and culture. We will need cultural leaders in cities (designers, engineers, artists, writers) to catch the vision and show us how cool wood can be. We will need city agencies to create novel partnerships with real places and people where forests are managed transparently and sustainably. And we will need urban consumers (individuals, organizations and governments) that recognize and are willing to pay for forest products that support the many stakeholders in the value chain stretching back and forth between the forest and the city. For our global story to end well, cities must first learn to see and listen to the faraway forests. Once they see forests for what they are, cities will step up, and offer to lead the dance, inevitably leading to a new and exciting love affair. Taking the long term view, cities and forests will find a myriad of ways to support each other and work together as mysterious and powerful partners in what could just be, happily ever after.

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Forests and cities share several intrinsic characteristics that can help this virtuous cycle accelerate

• Wood is beautiful and charismatic: an endless muse for both modern and traditional design, at any scale.
• Cities are at the forefront of the discourse on climate change.
• Forests are now recognized as one of the most significant factors in climate change mitigation.
• Cities are full of energetic experimenters and tastemakers, “early adopters”, and risk takers - often willing to pay more for something meaningful, new and exciting.
• Forests are coming into mainstream consciousness through the voices of art and science that invigorate and nourish city life.
• Cities have money. Concentrations of wealth means that people with means can pay for new ideas that are not yet efficient, often just for the prestige of “being first”.
• Cities are diverse. Different needs and desires mean that parallel experiments can happen side by side. Subsidized housing projects and luxury condos can learn and benefit from each other, and usually do.
• Biophilia is a growing trend and science. People are increasingly looking to natural solutions in design and architecture. Wood provides a significant set of biophilic solutions.
• Health and the science of environmental psychology (and physiology) show that both wood environments, trees, and forests are powerful antidotes to many serious ailments.
• New forestry approaches and tools, social and technical, are expanding our ability to extract wood with less harm to forest systems.