DEBATES AND INTERVENTIONS

Placing Cities in the Circular Economy: Neoliberal Urbanism or Spaces of Socio-ecological Transition?

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TITLE

Wood works: How local value chains based on urban forests contribute to place-based circular economy

ABSTRACT

Wood is abundant in cities around the world, but its potential contribution to circular urban economies has received little attention. Whereas current practices are mostly limited to low-value uses in the form of mulch or firewood, we document the emergence of an ‘urban wood movement’ that successfully created local value chains in cities across the United States, Canada, The Netherlands and Belgium. Value chains for urban wood vary in their production capacity, professionalism and institutional set-up. Common features include a need for effective local cooperation across diverse actors and the development of storylines akin to the principle of value cascading. We suggest three avenues for further research that are concerned with the potential contribution of urban wood initiatives to 1) the provision of positive economic and environmental impacts; 2) debates on sustainable forestry focusing on decentralization and local control; and 3) knowledge on viable business models in short-circuit economies.

ARTICLE

Overlooked and underused

The transition from linear to circular economy has motivated researchers and practitioners to look at cityscapes as ‘urban mines’ for materials. Urban mining could decrease pressure on ecosystems and resources by providing reclaimed building materials from renovation and demolition projects or precious metals contained in post-consumer waste streams (Brunner 2011). The objective of this short article is to highlight the relevance of a resource that has been overlooked in efforts to steer urban economies towards circularity: urban forests.

Trees are surprisingly abundant in cities around the world. According to the MIT Senseable City Lab, around one-fifth of the surface of cities like Amsterdam, Boston, Frankfurt and Geneva is covered by tree canopy. In Berlin, city officials have counted 431.000 street trees. Since trees are living organisms with a limited lifespan, the quantities of wood harvested in cities are also substantial. According to Stadshout Amsterdam, the Dutch metropolis produces ca 2,000 m³ of exploitable roundwood per year. The annual production of wood on the island of Montreal is estimated at 11,000 m³. Brussels, with its 5,000 ha of peri-urban forest, produces as much as 20,000 m³ every year (Bruxelles Environnement 2019). While tree coverage in cities varies greatly, many older cities in Europe and North America are literally covered with trees.

Despite this relative abundance, few cities make the best use of wood. This can be seen by evaluating current uses of urban wood against the principle of “cascading in value” (Jarre et al 2020). The latter stipulates that circular economy of wood should prioritize the highest possible value over the whole life cycle. Ranking different uses from lowest to highest value, the most important cascades for wood are its use as mulch (i.e. shredded biomass from trees used as ground cover); as fuelwood, firewood and wood chips; in industrial pallets and frames; and, in its most valuable form, as lumber.

Biomass from trees felled in most North American and European cities is rarely used for anything but the lowest value applications, i.e. as mulch and firewood. This is a missed opportunity for transitioning towards circular economy, but pioneering initiatives in a range of cities have started to develop business models and vibrant local economies that suggest that the situation can be improved.

The emergence of an urban wood movement?

In various locations across the United States, Canada and several European countries, initiatives have started to develop local solutions to go beyond low-value uses of wood. While some arborists and tree service companies have always produced lumber, efforts to do so on a broader scale and in a more systematic way have gained momentum in the United States since the late 2000s. This coincides with the massive infestation of urban trees with the Emerald Ash Borer (*Agrilus planipennis*) that forced city authorities and private property owners to fell ash trees in large numbers. In 2014, the US Forest Service supported the emergence of local value chains through the program ‘Bringing Urban Forestry Full Circle: Localized Approaches for Capturing Value and Enhancing Public Benefits of Urban Forests’. This has also facilitated the creation of a national ‘Urban Wood Network’ to federate initiatives across different cities and states.

During the 2010s, local wood initiatives have emerged in a host of Canadian and European cities, some of them also responding to catalyzing events such as ash borer infestation (in Montreal) or increased windthrow of beech trees after several years of unusually dry summers (in Brussels). Amsterdam started producing local wood in 2010 and has spearheaded the movement in Europe by supporting the emergence of local value chains in ten Dutch and three Belgian cities.

Each local value chain has its own trajectory and set-up. Some are initiated by arborists or individual woodworkers, others by sawmills, kiln operators, wood wholesalers or public authorities. Yet others are the result of a local coalition including several of these actors. There is also a wide variety in terms of production capacity, professionalism and business models across different cities. A common feature, however, is the need for some form of coordination among different types of actors as well as across the subsequent phases of the wood supply chain (harvesting, sawing, drying, commercialization and secondary transformation). A second common element is that most urban wood initiatives develop a storyline that resembles the principle of cascading. A frequent motive in their communications is that precious urban trees converted to lumber are “saved from the wood chipper”, i.e. saved from lower-value uses as mulch or fuelwood.

Contribution to place-based circular economy

We submit that local value chains around urban wood are a relevant contribution to circular economy: they create value and attractive local jobs based on a sustainably sourced material flow. The vibrancy of the urban wood sector has also created demand for supporting industries ranging from business support specializing in urban wood companies over product design services to manufacturers offering tools and machinery adapted to the relatively small scale of urban wood operations.

The vibrancy of local value chains for urban wood stands in contrast to a lack of research into their socio-economic, environmental and cultural contribution. We conclude this article by suggesting three promising avenues for future research in this area.

First, urban wood initiatives appear to be preferable to the predominant use of urban biomass as mulch or firewood, but further research is necessary to measure economic and environmental impacts more precisely. While value cascading is a useful guidepost for suggesting that urban wood initiatives create value, in-depth studies using life-cycle analysis from tree to timber are necessary to provide a more nuanced picture. For instance, the relatively small scale of urban wood operations could be associated with inefficiencies that partly offset the environmental benefits of local transformation. The energy-intensive steps in the value chain – and foremost kiln drying – should be a focus of impact measurement.

Second, research on value systems around urban wood could make a timely contribution to wider debates on the sustainability of the forest sector in general. Scholars of sustainable forestry have recommended changes in forest governance such as ‘decentralisation of forest management’ (Hajjar and Molnar 2015) and ‘locally controlled forestry’ (Macqueen and deMarsh 2015). Given that central governments and industrial forestry players are absent in urban value chains, the latter are examples of decentralised and locally controlled forest resources. Whereas literature in this area has focused on rural forests in developing or emerging economies, insights from local value chains based on urban forests in Western cities could broaden our perspective on policy options and business models associated

with decentralisation and local control, potentially leading to the creation of regenerative urban landscapes (Marin & De Meulder 2018).

Finally, the economic models underlying urban wood initiatives provide another avenue for promising research. Given that efficiency and economies of scale of city-level operations are presumably lower compared to industrial forestry, the apparent economic viability of local value chains merits close attention. Understanding how local alliances around urban wood manage to be economically viable despite their relatively small scale could inform research on short-circuit economies and other local value chains, for instance in the burgeoning literature on urban agriculture. A hypothesis that emerges from our exploratory research is that urban wood businesses are highly successful in developing place-based storylines. They can tap into the value urban dwellers associate with local trees that they experienced in their daily life. The storylines they develop appear to transfer some of this value to wood-based products. Importantly, urban wood initiatives seem to be capable of translating abstract circular economy concepts like ‘value cascading’ into more relatable narratives whose symbolic and emotional content strikes a chord with local populations. It is possible that research on urban mining has overlooked the importance of urban wood because its focus on industrial processes and anonymous stocks and flows failed to recognize the potential place-specific symbolic value of each individual tree.

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