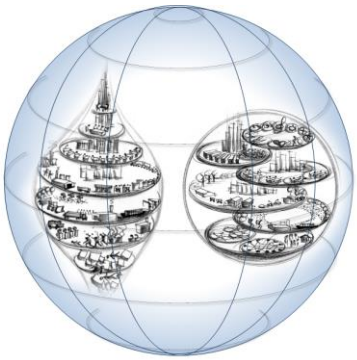
Deeper City

collective intelligence and the pathways from smart to wise

5-3



Which Resources:

Circul-onomics-III

REVIEW DRAFT – NOT FOR CIRCULATION

Visitors from Mars would be amazed at how Earthlings run their global 'take-make-dump' system. Peasants and indigenous peoples are dispossessed of their fields and forests by giant mining firms in the so-called 'developing' world, who produce hi-tech aluminium cans for chemical-intensive fizzy drinks, which then litter the streets of a so-called 'developed' world, whose people then struggle with obesity and diabetes. But this isn't only about resources – it's about the money which drives rapacious extraction, addictive consumption and reckless waste. As Paul Hawken put it, 'We have an economy where we steal the future, sell it in the present, and call it GDP.'[1]

As for what's to be done, businesses can do the minimum to avoid prosecution (environmental 'compliance'), with linear *Mode-I* thinking. Or, they can look for incentives and innovations, entrepreneurial eco-products or services, eco-markets or eco-finance (*Mode-II* evolutionary thinking). Or possibly, they can look *deeper* and *wider*, by co-learning and co-innovation, to mobilize the synergies between many firms, many sectors, many customers, many technologies and many supply chains. Many have explored the economics of a finite world in steady state economics, doughnut economics, prosperity without growth and so on, (see ***PROSPERITY-III,*** *(Fig.5-6)*.[2] But for 'what's to be done', the responses often seem to fall short, relying on *Mode-I* regulation, *Mode-II* markets or aspirations which may not be realistic.

Our case here, quite simply, is that this is about *things* and *thinking*, that 'material resource recirculation' follows from '*collective resource intelligence'*. So we look for the capacity for collaborative learning and thinking in order to re-connect economic cycles with resource cycles and ecosystems, global limits and local capacities.

The big agenda on the table is the 'Circular Economy', an entire system based on circular resource flows rather than linear. Showcased by the WEF and OECD, demonstrated in hi-tech countries such as Japan, espoused by Unilever and Coca-Cola, and promoted by non-profits such as the Ellen MacArthur Foundation, it all seems logical. Raw materials and waste disposal cost money, so the more recirculation, the more cost-savings to business and consumers, with further eco-social benefits on top.

Figure 5-3

CIRCUL-ONOMICS–III

Co-evolution from linear to circular resource flows: with finance, social & public value

a) RE-CIRCULARIZATION

FINANCE: mutual finance for integrated value chains

Carbon mortgage or long green bonds??

TECHNOLOGY: circul-onomic design principles

INDUSTRIAL ECONOMY: design for material loops & cascades

Buy a new eco-product or fix the old one??

GOVERNANCE: recirculariation policy principles

Circles are everywhere if you look for them...

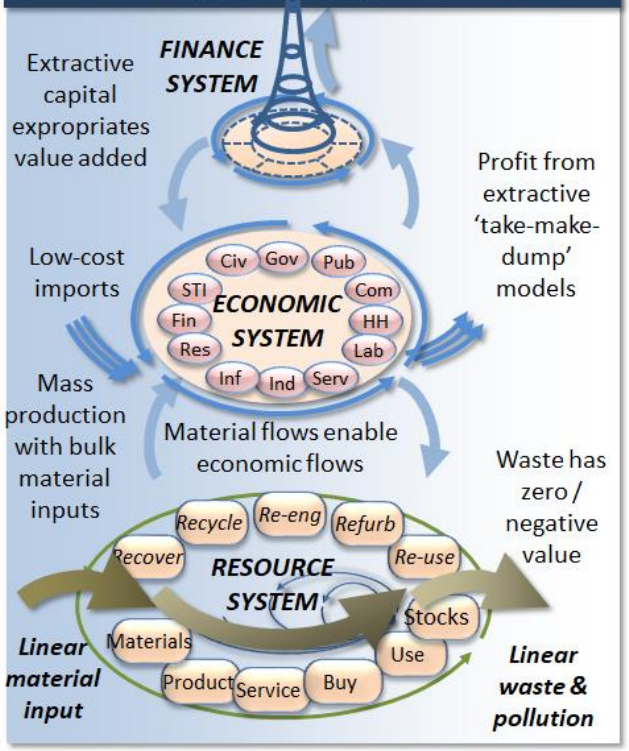
URBAN SYSTEMS: regenerative cycles of assets & resources

SOCIAL: livelihoods of socio-circular value

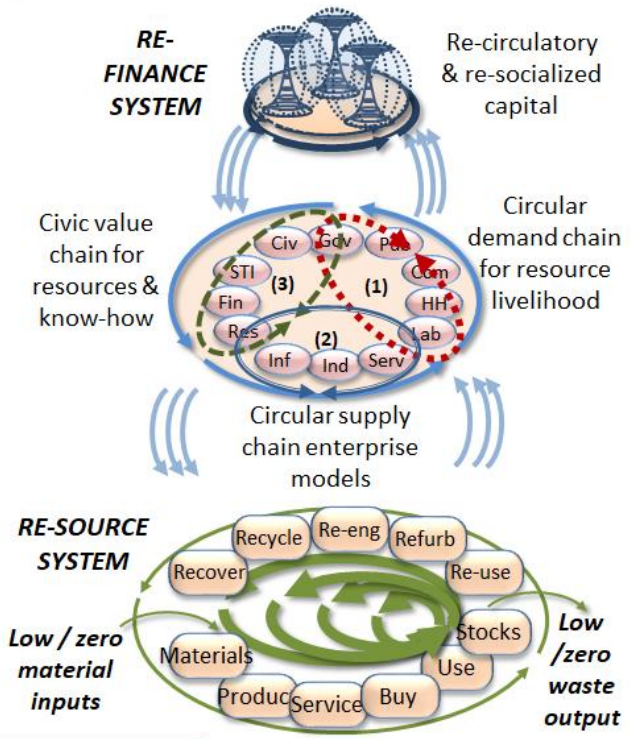
Share 'pre-loved' or lease new stuff??

ECOSYSTEMS & RESOURCES: local / regional / global recirculation on 'socio-eco-services' principle

b) LINEAR ECONOMIES–I&II



c) CIRCULAR ECONOMIES–III



d) PATHWAYS

Socio-political gaps: culture of material consumption & obsolescence:

Techno-economic gaps: low ambition & myopic supply chains

Eco-financial gaps: short horizons promotes materialism & waste:

Circular livelihood *(demand chain)*: mutual ownership for collective re-use of assets

Circular co-production *(supply chain):* markets & enterprises on service model

Circular investment *(civic-chain)*: eco-social finance for whole chain innovation

The ‘waste hierarchy’ sets out the options, starting with re-use of the product, then refurbishment or re-engineering, then recycling of materials and recovery of energy.[3] The details of recirculation are different between organic-renewable materials (farming, forestry and fishing), and inorganic materials (mining and quarrying), and hybrid products can be complex, but the main principles are clear.

In practice there are gaps, traps, barriers and perverse incentives all over. Despite the warm words of CEOs in forums and webinars, it seems that Unilever, Coca Cola and others are there firstly for market dominance and shareholder value.[4] And it seems inevitable that the clever niches of marginal recycling or zero-waste production will soon be overtaken by new technologies and product lines, new market segments, new consumer experiences. For example, in every northern city, the eco-benefits of Fair Trade coffee are now outweighed by new energy-guzzling patio heaters, warming the *cappuccinistas* on the terraces. If business is driven by short-term profit and market share, a culture of material consumption and a social context of status-seeking identity, there will always be energy and materials in the wrong place, time, shape, condition, hazard, life-cycle stage or ownership, which are uneconomical to reuse/refurbish/re-engineer/recycle.

Also, the principles of circularity are complicated by the material accumulation of ‘stocks’ in the building of cities and infrastructure, plus the countless appliances and fittings which go with them. Meanwhile the global urban population is projected to double in the next 25 years, and with rising incomes and affluent lifestyles, the energy/material use per person could grow by a factor of four.[5] Furthermore, material chains are ever-more complex: an average smart phone now contains over 60 elements of the periodic table, while Fair Trade phones are designed for disassembly (so far it’s a minority niche).[6]

We could ask, what would it take, for all materials, in all products in all supply chains, to be in the right place, time, shape, condition, ownership and life-cycle stage, for recirculation at the most suitable level? This would call for a new paradigm of production and consumption, with collaborative learning on a global scale. Each sector and each technology would adapt its supply chains, technologies and business models towards those of its suppliers and clients, up down and across the value chain. Each firm would look not only inside its own boundaries, but outward to its friends, relations, rivals and competitors (see ***ENTERPRISE-III***, *Fig.5-4*). And as this seems to push ‘economic’ activity towards new levels of collaboration, from material exchange to knowledge exchange, from circular resources to circular finance and social values, it deserves a new title – *‘circul-onomics’.*

Circul-onomics starts from the ‘know-how’ of firms and enterprises, and the ‘know-how-much’ of financiers, and the ‘know-who and why’ of communities and cultures. Only when these are fully aligned with ecological cycles can we expect them to really circularize. This is more than businesses or consumers suddenly seeing the light (although eco-visions are crucial). It’s more about a phase-change, from a standard business model towards a *deeper-wider* ‘socio-eco-enterprise’ model. Finance shifts from short-term profit to longer-term collateral, while consumers/clients shift from ownership-purchase to service-maintenance. Technology innovation shifts from niche gadgets to integrated supply chains.

Recirculatory pathways.

At the top of ***CIRCUL-ONOMICS-III*** *(Fig.5-3),* the visual thinking looks like inter-connecting circles where the ecological, financial, economic and social cycles all mesh together. In each of the central diagrams (***b*** & ***c***), finance is at the top of the tree, in the middle is the economic-industrial metabolism, and underlying that is the material metabolism, from raw inputs, to production, consumption, usage and end-fate. A 'change mapping' would show the transformation context, framed by some as 'industry 4.0', with profound challenges for *circul-onomics*.[7] Freestanding products shift towards component systems and services, mass industrial production shifts towards distributed or additive manufacture (harder to coordinate), and standard materials move towards hybrid composites (more difficult to recycle).

The syndrome mapping at centre left ***b)*** of ***CIRCUL-ONOMICS-III,*** shows a fragmented and dysfunctional system, driven by a powerful stream of money, flowing through profit-seeking enterprises and gravitating upwards. The result is a powerful stream of stuff, from virgin materials, through the supply chain and demand chain, to residual waste and pollution.[8] There may be some marginal re-use, recycling or recovery, but only where directly profitable or cost-saving to individual firms. To keep the economy turning, the system manipulates consumers into buying more 'stuff', in a never-ending pursuit of material excess. Any ecological impacts are dumped, ('externalized' in technical terms), along with illegal land-grabs, 'resource-curse' corruption, consumer hazards, pollution and climate disruption.

The alternative shows resources, products, components and materials recirculated between every point on the production supply chain, with near-zero inputs and near-zero waste, at the centre right ***c)***. Business and enterprise models are based on whole supply chains and demand chains, and the recirculation between them. Finance now recirculates investment for integrated value chains, longer-life product-services and ecosystems stewardship. Social norms and lifestyles are also crucial for the culture of reciprocity and willingness to re-use and recirculate.

So how to get from here to there? These are general pathways, each based on one of the *deeper, wider* value chains, shown in ***d)***.

Circul-onomic livelihood pathways *(working with social-economic synergies),* centre on the demand-chain and consumption side. We can't assume a sudden rush of altruism or ethical conversion by consumers. But we can explore the synergies between psychological well-being and cultures of sharing, or the synergies between financial incentives and everyday social practices. In times of recession, longer-term thinking is a lower priority, and in a free-market discourse, restrictions on packaging or similar details seem like bureaucratic red-tape. So, we need to look first at the frame of thinking. If we assume that consumers are *de facto* materialistic and individualized, then behavioural psychology brings us 'Nudge' theory, which targets the marginal decisions of consumers, with carefully arranged 'choice sets'.[9] However, if consumers are also members of families, communities and cultures with the potential for collaborative consumption, this calls not only for 'nudges', but something like 'co-nudges', meaning choices that gain value by reciprocity and meaning, which then lead to collective action.[10] Then we look to public governance to

set the ground-rules for this, with stewardship, standards, quotas, price signals or procurement. And we look for enterprises and supply chains to provide practical opportunities, for instance with lifetime plastic bags, repairable phones or recycled construction materials.

For the ***circul-onomic value chain pathways*** *(with techno-economic synergies*), a circular business value loop looks for opportunities in the 'service value' concept (as in 'energy services companies') and in the 'symbiotic' principle for recirculation, as with the example below of Industrial Symbiosis . Meanwhile there are technology trends which could support or possibly disrupt this pathway.: For instance IoT can work with block-chain systems to track every product or component in space, time, usage and ownership. Much advanced production is also moving to digital platforms such as Manufacturing 4.0 or BIM (Building Information Management): and social media platforms have massive potential to link supply with demand, provide feedback along the supply chain and mobilize value chains in the sharing economy. However, each of these could go the other way: IoT might lower the production costs and increase demand, and social media can easily promote addictive consumption. Bridging the gap between negative value waste and positive value recycling, calls for circularity both of 'things' and of 'thinking'.

Circul-onomic institutional pathways *(based on political-economic synergies)* work with all forms of capital, finance, land, skills and technology. Finance is needed to support the services concept with new models for life-time leasing rather than one-off material purchase. Where ecosystems or resources involve collective or public goods, we need financial assets of mutual co-ownership, rather than extractive lending.[11] *Deeper* value chains can be mobilized by intelligent finance, such as natural capital accounts or social investment bonds. *Wider* value-chain finance looks for ways to build eco-social collateral on the principles of developing country micro-finance, with developed country equivalents.[12] And a *further* financial model looks at advance innovation capital, not only for individual firms or technologies but whole supply chains. With a clear pathway for finance, other kinds of capital can also be mobilized, such as land, labour, technologies; and the social value markets or eco-value markets can be adapted to suit.

> *(Box 5d)* Example: collective industrial intelligence
>
> *The UK National Industrial Symbiosis Project (NISP) was one of the closest in recent years to a synergistic model. NISP worked with a whole industrial community or sector in a co-learning and capacity building process, exploring potential for collaboration and exchange. Many of its initiatives were purely practical, about the exchange of waste materials, but sometimes it was the catalyst for wider chains of business and societal value generation. Ironically the government funder DEFRA dropped out after the pilot phase, precisely because the scheme linked environment with business, and so fell between the two departmental silos.*[13] *However, the spin-off business has many international clients and sponsors, from Brazil to Japan, where Kawasaki has possibly the world's most advanced circular/symbiosis programme.*

Notes

[1] Hawken 1997
[2] Jackson 2009, Raworth 2017
[3] Webster 2017
[4] Unilever CEO Paul Polman, pers.comm, One Planet Business Forum 2011.
[5] UNEP & International Resource Panel 2014
[6] Hausmann et al 2011
[7] Schwab 2015
[8] Miller 2010, www.storyofstuff.com
[9] Thaler & Sunstein 2008
[10] Botsman & Rogers 2011
[11] Circle Economy 2016, Ellen MacArthur Foundation 2012
[12] ING 2015, Yunus with Weber 2008
[13] Lombardi & Laybourn 2012