04. An Interdisciplinary Approach to Circularity

Deciding for circularity: a multi-dimensional affair

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There are many challenges in operationalizing the concept of circularity and applying it to the built environment. On a general level, the concept has enormous bridging power: nobody will oppose the intentions of reducing resource use to safeguard our planet. When we want to operationalize the concept, we run into difficulties. The concept includes many values which are -to some extent- competing and conflicting. Such a concept is called an 'essentially contested concept', meaning that it is impossible to unequivocally agree on the essence of the concept. It has characteristics of a 'wicked problem': it is not possible to define the problem unambiguously and it is impossible to define criteria to evaluate whether the problem has been solved.

The wicked character of the concept can be recognized in our struggle to implement circularity in the built environment. In a growing number of regions and countries, *circular economy aims have been embedded within government policies.* The built environment, with its massive consumption of natural resources and waste production, is a logical sector to target for governments. On the level of the state, ambitions tend to be formulated in terms of emission reduction and waste prevention. *Heuristic guidelines, rules of thumb, help policy makers to implement these policies.* Policy makers can range from fully public – government organization – to fully private – such as firms.

A well-known example of a heuristic guideline is the R-ladder, identifying a hierarchy of preferred strategies. It starts with refusing the use of materials as the most wanted strategy, and through strategies as rethink, reduce, reuse, and repair it ends with the least preferred options being the recycling of materials and the recovery of energy. This R-ladder is highly applicable to products and chains of production and consumption of a particular product. It can guide the definition of regulatory conditions and requirements for a product and the design and use of it. But can such a strategy also be applied to products as buildings, neighborhoods, cities or even regions?

Applying the R ladder in spatial scales

When we unpack the built environment in spatial scales, a natural hierarchy of decision-making can be seen. Infrastructural decisions channeling resource flows are conditional for the functions embedded within those infrastructures. This is easily imagined for a green-field development. But *in all cases, we already start from a given context.* Usually there are already *buildings, streets, bridges, pipes, pumps*, all with a particular function, lifetime, owner and user. And also, in greenfield developments there is a *landscape with ecological values and functions* in place. In redeveloping the built environment, whether it is on the level of a building, block, street, neighborhood, or part of

a city, there are thus already lots of factors and actors to consider, making it more difficult to adopt circular principles.

When we unpack the built environment along other dimensions, such as resources, we see other complications: *spatial scales overlap and are not in line with administrative scales*. For example, water catchment areas do not coincide with municipal or regional boundaries, energy is generated and distributed over long distances, as is the case for food. Also repair and especially recycling policies have led to global return logistics that do not coincide with the spatial boundaries of governments, whether they be national or local.

Determining the appropriate scale for policies

So, what is the appropriate scale to formulate and implement policies for a circular built environment? Unpacking the built environment shows that this straightforward and logical question is not easy to answer. This provides policy makers and decision-makers with an excuse for not acting. This can result in a wait-and-see strategy – others need to act first. If actors do act, they run the risk of making sub-optimal decisions.

Pilot projects or experiments have become a popular instrument to avoid such implementation paralysis. Through trial-and-error, governments but also industry have started to develop and test solutions. *If something works, it can be replicated or upscaled. If something does not work, it is a valuable lesson without big losses, including loss of face.* After all, it was an experiment. This approach has led to many experiments all over the globe. The challenge is to recognize and acknowledge when lessons have been learned that are ready to be implemented at a larger scale, and then to actually take the step from the trial stage to the wider implementation stage. Political will is key.

Additional considerations

Unpacking the *built environment* along multiple dimensions also shows that *dimensions do not always develop at the same speed.* For example, the circular building movement could build upon the knowledge and experience of green and sustainable construction, which had developed since the 1960's and 70's. Also, the energy-related aspects of a circular built environment could build on the experiences gained in the past fifty years in this field. Institutionally, we see a that those *aspects that can build on a longer tradition and stronger knowledge base can develop much quicker than other aspects*: the language, methods and tools are already there, as well as the institutional capacity and structures to take action. As a consequence, *these aspects are dominating the way in which other, less well-developed aspects take off.* Often the institutions and institutional practices, way of working, is borrowed and copied to these other aspects. On the one hand *this can lead to a quick uptake of a development*, *on the other hand this can lead to a path dependent development that might not fully fit the aspect concerned.* An example is the way in which we try to define the circular development of areas. We try and copy-paste the approach developed for buildings, with overall energy performances of areas, requirements for water and its material use. The question is if all these more 'technical' requirements add up to a circular area, or that an urban area is perhaps more than the sum of its flows.

In brief, I have introduced some of the challenges

in defining, operationalizing, and implementing the circular built environment concept. By unpacking the built environment along various dimensions, I have shown that there are different ways to come to understand the circularity challenges. One conclusion for sure is that all stakeholders involved in a particular project will have their own preference for unpacking and will have their own legitimate reasons for doing so. The key takeaway is that implementing a circular built environment will thus always call for multi-actor decision-making.