Using the Community Capitals Framework to advance a circular economy: a review from a design research perspective

Robins, Jessica C.*; Cruickshank, Leon; Tsekleves, Emmanuel

*University of Lancaster, Lancaster, UK.
*j.robins@lancaster.ac.uk

doi.org/10.21606/iasdr.2023.619

This article provides a scientific review from the perspective of design research on the application of the Community Capitals Framework (CCF) to promote a circular economy. The CCF acts as a lens through which to examine the stakeholders of organisations and visually map their networks. This article discusses the use of the CCF in circular economy research; the different elements of the CCF; and how this framework can be applied to stakeholder maps. The images are taken from the research and show a sample of the maps drawn by the research participants during interviews, and those same maps redesigned with the CCF applied. By using the CCF and applying it to stakeholder maps, organisations can identify which of these relationships provide value as defined by the different capitals.

Keywords: circular economy; community capitals framework; organisational transformation; sustainable transitions

1 Community capitals and the circular economy

The transition to a circular economy requires a fundamental rethink of how economic processes, and how economic progress is measured. Measuring value in terms of capital, as proposed by Stahel and Clift (2016), and using the Community Capitals Framework (CCF) offer new perspectives on the circular economy. The CCF, originally developed by Emery and Flora (2006), encompasses various forms of capital, such as natural, cultural, human, social, political, financial, built and digital capital. This review explores how the CCF can be applied to promoting a circular economy and identifying valuable relationships.

Stahel and Clift (2016) refer to different capitals as stocks, seeing goods as something to be gathered, in opposition to common economic measurement of flows, where goods move through systems. They place a greater value on stocks as that is what is usually used to demonstrate wealth rather than resource flows, “arguably, the quality of life in a developed society depends more on the quantity and quality of its stock than on the flows through the economy.” (2016, p. 138). Traditionally, capital refers
to finance and resources, Emery and Flora (2006) developed a system to discuss the wealth held within a community and where it could be built upon. This includes other sources of capital that move beyond tangible, monetary resources, adding value to individual lives and society as a whole (Callaghan & Colton, 2008; Emery & Flora, 2006; C. Flora et al., 2004). The ‘Community Capitals’ that Emery and Flora proposed for use within their framework are ‘natural’, ‘cultural’, ‘human’, ‘social’, ‘political’, ‘financial’, and ‘built’. Nogueira et al. (2019) added ‘digital’ capital to reflect the importance of digital infrastructure to contemporary society.

2 The Community Capitals Framework

The CCF is a systems thinking method that maps the structure of relationships between the different forms of capital. It emphasizes the interactions and dynamics between these forms of capital and emphasizes that each capital is equally important within the whole. The CCF provides a way to create resilient communities by allowing improvements in one form of capital to carry over to other forms of capital.

Systems thinking methods have allowed researchers to map the structure of relationships among components of a complex system, explore the dynamics of relationships among them, including causal relations and feedback loops, and explore how changes in components or their relationships with other parts affect the whole. (Nogueira et al., 2019)

The individual elements of the CCF work together to create resilient communities. Improvements in one area of capital have a knock in effect among the other capitals and the benefits can be seen as ‘spiralling up’ through the community. This also makes the case for not neglecting any aspect of the CCF because of the negative, ‘spiralling down’, knock-on effect this can have. The CCF cannot be viewed solely as each individual capital acting alone, it is best viewed as a whole entity made up of equally important parts.

2.1 Application of the CCF to the circular economy

The circular economy requires a rethinking of economic processes and the use of systems thinking to optimize the entire supply chain. The CCF can serve as a tool to examine the relationships within an organization and identify where value is added to networks. By applying the CCF to stakeholder maps, organizations can gain insight into the valuable relationships they have and how they contribute to a circular economy.

The circular economy model has been developed using systems thinking and forces an examination of every part of the production process: identifying where there is waste and how this waste can be designed out or become a new resource; nutrient cycles and where resources can be returned to restore nature; energy systems; and material sources and technology. Beyond the production process a system thinking approach is applied all along the supply chain to ensure circular economy principles are followed at every step, employing feedback loops to constantly improve and evolve the different sections, to ensure the whole system remains up to date and within the circular system.

Yet this transition requires interventions in consumer behavior, market rules and dynamics, cultural heritages and social contracts, as well as both the physical and the digital infrastructures through which individuals and organizations produce and consume things. (Nogueira et al., 2019)
The key places where the circular economy and CCF systems overlap appear through an understanding of the economics of the circular economy: changing economic aims to live within the planetary boundaries; and prioritising society over profit. The addition of the CCF uses the capitals as representations of the different parts of this new type of economy, that looks beyond just measuring financial flows. The CCF demonstrates the systems needed to create a decent and just transition. Using the framework as a tool to examine an organisation’s relationships can give an idea of the types of relationships an organisation has, and where they are putting value into their networks.

2.2 The eight types of capital within the CCF
This section explores the different forms of capital that make up the CCF, such as human, natural, cultural etc., and how they are applied to the research discussed in this article. The capitals are discussed equally, and how they interact with one another to create overall value for the community. Ignoring one type of capital can have a detrimental effect on the others, whereas a specific focus on one could have a positive knock-on effect too.

2.2.1 Natural capital
Natural capital represents the “stock of renewable and non-renewable resources provided by nature” (Throsby, 1999, p. 3) and the systems that ensure there is life on Earth. These systems include the climate, soils and land, water cycles etc. without which there would be no other types of capital. Within community capital research there is recognition of the value that Natural or Environmental Capital holds over the other types of capital and the impact that the degradation of Natural Capital has on the other forms of capital (Callaghan & Colton, 2008; Emery & Flora, 2006; Stahel & Clift, 2016). The regeneration of natural capital is an important element of the circular economy (Ellen MacArthur Foundation, 2013a), although it is identified by Buchmann-Duck & Beazley (2020) as a neglected area that can contain contentious strategies, “[it] poses a threat to elements and areas of less “valuable” (or under-valued) bio-diversity that do not compete well in terms of market indicators or measures” (2020, p. 4).

2.2.2 Cultural capital
Cultural capital is the value ascribed to culture in a given society or community. Culture can be described:

\[
\text{as an expression of group or collective aspects of people’s behaviour, as demonstrated in their activities and belief systems. Thus, in broad terms something can be said to be of cultural value if it contributes to these shared elements of human experience. (Throsby, 1999, p. 6)}
\]

Within the CCF, cultural capital is seen to exists as tangible and intangible assets that a community holds. The tangible expression of cultural capital can be measured through heritage building, sites of religious importance, and works of art. There are also intangible expressions of culture that contribute to cultural capital. These assets include the “artistic practices undertaken by creative individuals in the context of [...] places and communities which generate meaning [...] and] experience” (Scott, Rowe, & Pollock, 2018, p. 2). This can be reflected through the values and beliefs of a community, whether through religion or a shared history, or through the creative expression of a place.
2.2.3 Human capital

Human capital is a traditional long-term productivity measure used to describe the value of an individual to society in terms of their labour (Becker, 1964). It is developed through investment in that individual: whether by the state (in terms of formal education), their employers, or themselves. Human capital is something that has to be constantly built upon and developed, “it is the only type of capital that will deteriorate over time if left unused.” (Stahel, 2010), this is on an individual, community, and societal level. Over time, investments in human capital, in shared education and knowledge, cause advances in technology, which in turn, demand more skills and expertise.

Within the CCF, human capital moves beyond an individual’s value to the labour market and places value on their skills and knowledge as tools to enhance the community. It places value on an individual’s ability and motivation to develop the skills they have through access to external resources, adding to the resources of the community through the acquisition of more skills and knowledge.

2.2.4 Social capital

Social capital is used to describe an individual’s worth to society through their intrapersonal skills, connections, and networks. All individuals have a level of Social Capital, which is formed through connections with other people (Coleman, 1988). There are different types of Social Capital: bonding, formed through strong ties such as with family; bridging, which is inclusive and outward facing and facilitates the interaction of a diverse section of society; and linking, which is primarily concerned with access to power and is similar to political capital (Halpern, 2005; Putnam, 2000). “Social capital can improve the efficiency of other forms of capital – such as financial/manufactured capital, human capital, and environmental capital” (J. L. Flora, Sharp, Flora, & Newlon, 1997) through the building of trust, which in turn reduces transactional difficulties. Stronger levels of Social Capital leads to an increase of trust between actors, which allows changes and developments to be embraced more readily.

2.2.5 Political capital

Within the CCF, Political capital is the ability to enact community level change from the bottom up. It gives communities the power to shape their environment rather than having government or outside investors make decisions without local consultation (Turner, 1999). Political Capital works in the same way for communities that exist elsewhere, online for example, it is the value given by those in power to the experts in the area that is to be changed. Trust is an essential component in Political Capital, it can allow for more access to power and money through stable communities and good political representation on every level (Rossetti di Valdalbero & Birnbaum, 2017). Certain aspects of Political Capital are related to “linking” Social Capital, described by Halpern (2005) as an individual or community’s connections to structures of power, which provides the ability to enact social change.

2.2.6 Financial capital

Financial capital is the most basic form of capital, and where the use of the term capital originates. It is the way financial resources move around the community, the amount of this resource, and how it is invested to support the creation of “community capacity-building, to underwrite the development of businesses, to support civic and social entrepreneurship, and to accumulate wealth for future community development” (Emery & Flora, 2006, p. 21). There is an important degree of trust needed if financial capital is to be invested, as often a contract alone is not enough to mitigate the risk to investors. Trustful relationships must be mutually beneficial for all parties involved and cooperation
should be built into these relationships. Lorenz (1999) argues the importance of reputation in creating trust, which is shown within the CCF as where social capital and financial capital cross over, the higher the social capital of an individual, the better their reputation, and therefore the more trustworthy they would appear.

2.2.7 Built capital
Built capital is the final capital within the framework developed by Flora et. al. (2016). It refers to the man-made infrastructure around which all the other capitals exist. It can refer to newly built structures or buildings and structures that serve an important role in the community. “Although new built capital is often equated with community development, it is effective only when it contributes to other community capitals.” (C. B. Flora et al., 2016, p. 16). The built capital lens identifies connections that provide a physical infrastructure to the case study organisation. This could be in the form of a building or another type of infrastructure that allows the case study organisation to achieve its circular economy aims.

2.2.8 Digital capital
Digital capital has recently been introduced to the CCF by Nogueira et. al. (2019) to reflect the increased importance of digital infrastructure. Previously, digital infrastructure: broadband cables, server centres, etc., came under built capital, but they included it as a separate capital “due to the contemporary role of digital technology and data in shaping innovation practices within multiple contexts.” (Nogueira et al., 2019, p. 568). Digital capital exists as more than just the infrastructure associated with the internet, it also includes: access to online information; the different modes of communication and the tools that facilitate this; digital literacy; and skills of adaptability in using current, popular platforms (Roberts & Townsend, 2016).

3 Applying the Community Capitals Framework to stakeholder maps
During a study of circular economy focused organisations and their networks, stakeholder maps were created by the research participants (Figures 1 & 2). Following the digitalisation of the maps, the CFF was applied using data gathered through interviews and document analysis. Examples of the digital maps are shown in Figures 3 and 4. Through an examination of the of the capital frequency in each of the stakeholder maps it was revealed that human capital has the biggest impact on the organisations studied.

3.1 Human Capital
As can be seen in Figure 5, human capital is the most frequently demonstrated capital between the organisations studied and their networks. These are demonstrated through frequent associations with universities for each of the organisations and the use of communities of practice within the networks. The relative newness of circular economy as a concept, means that organisations developing circular economy business models are pioneering within their industries, constantly evolving, and altering their approaches as new technologies come into the fore, and more organisations adopt circularity. By emphasising the development of human capital, the organisations are positioning themselves to take advantage of and contribute to new developments in their areas.
Figure 1. Example of hand-drawn stakeholder map.

Figure 2. Example of hand-drawn stakeholder map.
3.2 Social and political capital
There were three Small and Medium-sized Enterprises (SMEs) studied, all of whom had more ties enabled social capital connections than the large, global organisations studied. Social capital can be viewed through this analysis as more important for organisations that are just starting out, especially social capital connections that create bridges between different sectors, or links to organisations with more political or financial power. Large companies often wield political power, so it is no surprise to see a higher frequency of political capital for the large organisations however, Organisation 3, an SME, have forged connections with different government departments through projects and “key contributor” involvement with trade associations, giving them a high level of political capital. Their network affords them access to political structures that are beyond the reach of many SMEs, giving them power to influence policy and circular economy strategy for their industry.

3.3 Natural capital
A capital that was surprisingly absent in the networks studied, considering its importance to planetary renewal, is natural capital. The renewal of nature is a key part of the circular economy, to regenerate and restore natural systems (Ellen MacArthur Foundation, 2013b). However, it is only Organisation 1 who place an emphasis on natural capital area through their connections. The other organisations do not seem to place much emphasis on this area, which could be down to a lack of funding or opportunities. Consequently, by overlooking this capital they are missing out on a key part of the circular economy, which is vitally important to its success as a model in the long term, as regeneration and restoration of the natural environment is a core part of wider circular economy agendas (BEIS, 2017; Ellen MacArthur Foundation, 2013b). More research will need to be done to determine why natural capital is being overlooked and what can be done to encourage its uptake among circular economy organisations.

4 Conclusion
The definition of capital put forward in this paper is the value contained within something and its ability to produce resources for other capitals. The CCF is a useful tool through which to examine network assets and interactions. By using the CCF as a lens to view an organisation’s network, this research makes the purpose of relationships “visible and tangible” (Manzini, 2015, p. 121). Using the CCF as a lens to explore an organisation’s relationships provides a means to examine the perceived value of each stakeholder to that organisation, and demonstrates to the organisation how their relationships can benefit them. It shows how each capital relates to the network as a whole and reveals how the different capitals are engaging with and contributing to a circular economy. More research needs to be done in examining the reasons for a lack of certain capitals in the relationships, and to build on this application of the CCF to further circular ambitions through visible and tangible relationships.
Figure 3. Example of a stakeholder map for a small-scale plastic recycling SME with the Community Capitals Framework applied.
Figure 4. Example of a stakeholder map for a business-to-business waste platform SME with Community Capitals Framework applied.
Figure 5. The frequency of occurrence of different capitals across the five organisations studied.

Acknowledgements
I would like to thank my supervisors for their guidance and support during my PhD, the NWCDTP and Transformation North West for funding the work, and the participants who agreed to give up their time to be part of the research.

References


