1059.1 Circular Community Concept for Health and Care

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ABSTRACT As the Sustainable Development Goals (SDGs) have become popular in guiding policy and program planning, we critically examine its role in addressing underlying systemic challenges when it comes to ensuring the health and wellbeing of vulnerable people in conjunction with the social determinants of health framework. In addressing the incongruencies in sustainable development and public health theory with practice, we turn to look at design approaches – in particular, the design of circular systems (circular systems design) in the circular economy – to reconcile the gap in theory and practice through a systems lens. Businesses and the built environment industry have demonstrated a growing interest around circular economy concepts in favour of reducing and reusing resources through designing out waste; we expand this interest to consider circular systems in health community design from the built and physical to socioeconomic environments. The case for circular systems in the social and economic realms to address health, wellbeing, and the healthcare industry has been less studied. Through examining the concepts behind the development of eco-community projects, especially those emphasizing elements of health and care, we consider a new paradigm for a wholes system approach in the design of healthcare facilities to health and care services provision.

Keywords: sustainable community development, health and wellbeing, systems design

Sustainable Development – A Systems Approach

Sustainable development is often associated with ecological-conscious development itself, with issues such as environmental conservation and recycling first coming into mind. However, if we consider the definition of sustainable development as described in the World Commission's Brundtland Report (World Commission on Environment and Development 1987), sustainable development is essentially anthropocentric, noting the goal of development is

'to ensure that it meets the needs of the present without compromising the ability of future generations to meet their needs.'

The tripartite structure of sustainable development is to consider the environmental, social, the economic realms, and the interactive nature of these systems is emphasized.
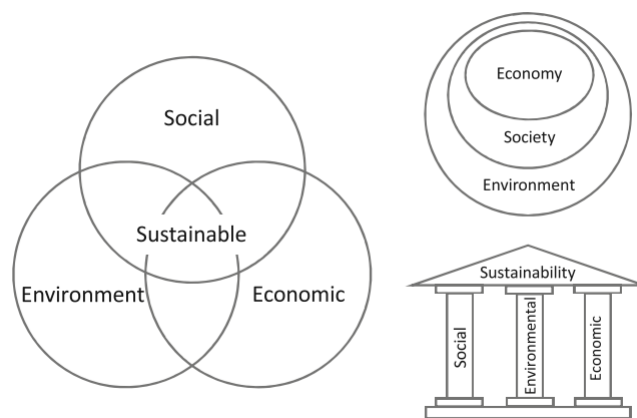

Figure 1: Pillars of sustainable development. Purvis 2019.

While the famous Venn diagram of the three interlocking circles of environment/social/economy have often been used to represent the three pillars of sustainable development, the exact relationship between these three "pillars" is a perplexing matter, as reflected in the different iterations of the diagram in Figure 1 above. The apparently utopic holistic systems approach has often been critiqued to be vague – without much specific guidance to operationalize each area and how they intersect in practicality (Purvis 2019).

Yet systems thinking plays a crucial part in the evolving area of sustainable development. Boulding (1956) points out the necessity of General Systems Theory to allow for a framework of thinking that is applicable across disciplines, enhancing communication between scientists and scholars of different fields as they have become increasingly organized into "isolated subcultures" of disciplinary siloes. Sustainability, as it concerns the environmental, social, and economic realms, is no doubt an interdisciplinary project.

Environmental sustainability often takes the spotlight in the sustainability conversation. Social and economic sustainability requires the global issues of exploitation and unequal development to be addressed. A less frequently quoted paragraph in the Brundtland Report (1987) reads:

'…sustainable development requires that societies meet human needs both by increasing productive potential and by ensuring equitable opportunities for all.'

While the Brundtland Report reads as such, Raco (2005) discusses the dissonance between development agendas that support neoliberal policies and market-driven practices, and the theory in sustainable development literature that calls for social justice, environmental conservation, and democratic empowerment. Although the sustainable development literature employs a holistic systems approach in analysing the problem, in practice, development activities once again fall back into the established status quo of unidimensional behaviours and responses.

Organizational inertia continues to be a major impediment to greater change in policy and programming that can truly address underlying inequities that affect the most vulnerable people – from infrastructure, energy, construction, to agriculture and healthcare. Swilling and Annecke (2012) write in *Just Transitions*:

> 'These sectors are dominated by large corporates configured as a set of value chains which are designed, specified, financed and managed by people trained to think in ways that reinforce the logic of these value chains, and their personal material interests are tied to tried-and-tested technologies embedded in these systems.'

Social Determinants of Health

The Social Determinants of Health framework to public health has gained traction since the 2000s as a similar systems approach from the sustainable development literature is used to understand and tackle issues in the area of population health.

The WHO currently defines the Social Determinants of Health as 'the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems' (WHO 2017). In other words, the social determinants look at a large subset of underlying systems, such as economic stability, education, health access, health systems, social context, the built environment, housing, public safety, and the natural environment.

While the field of public health has historically focused on medical interventions and treatment - mostly tackling disease, injury, mortality, and individual behaviours - the social determinants of health approach attempts to drive the field of public health to engage upstream in an extensive multi-sector transdisciplinary project. This is used to begin to address the problems found in the physical, social, service, and economic environments, along with its root causes in social and institutional inequities, as seen in the figure below (Bay Area Regional Health Inequities Initiative 2015).
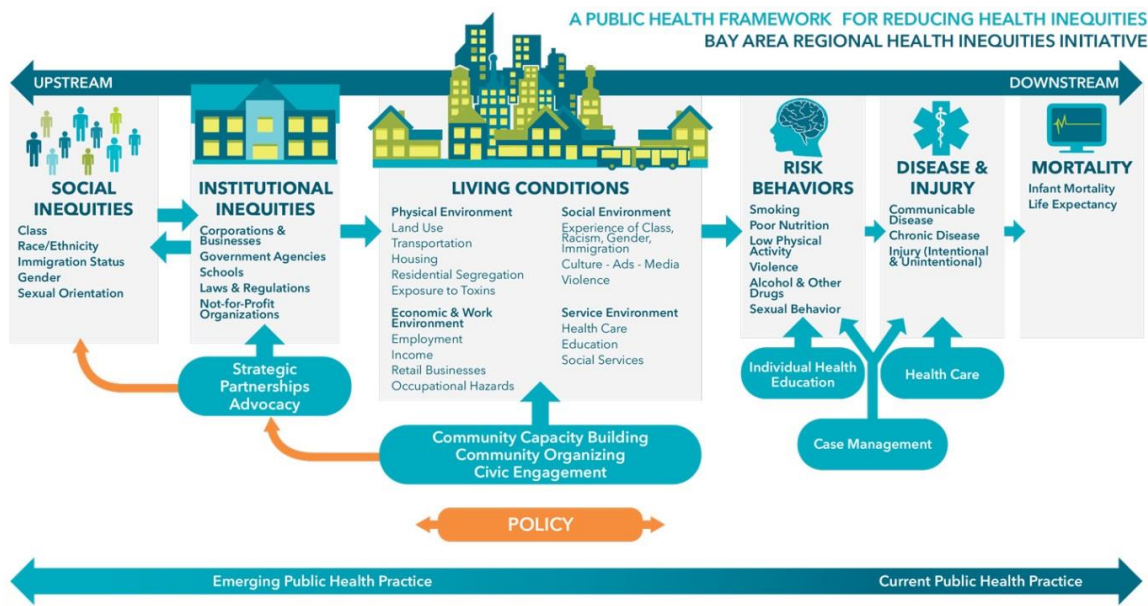
Figure 2: A Public Health Framework for Reducing Health Inequities – Bay Area Regional Health Inequities Initiative. Bay Area Regional Health Inequities Initiative 2015.

As *Health and Wellbeing* goal in the Sustainable Development Goals (United Nations 2015) aims to address public health issues, the sub-goals all pertain to traditional areas of public health in treatment and prevention of diseases, injuries, and mortalities – with the exception of perhaps the aim to attain universal health coverage and concerns with the effects of pollution and contamination.

Once again, we observe the incongruency between theory and practice in the area of sustainable development and health/healthcare. In a scoping review on the public health sector's role in addressing health inequities, Cohen and Marshall (2017) find that although there is advocacy in the public health sector to address root causes of health inequities via theoretical literature and professional practice guidelines, the review of empirical literature show that public health practices however do not widely address the root causes.

Furthermore, while the sustainable development and social determinants of health literature try to speak to issues of health and wellbeing, less has been said to address the healthcare sector. Nevertheless, the WHO (2017), published *Environmentally sustainable health systems: a strategic document* outlining the following principles:

- overarching action: adopting a national environmental sustainability policy for health systems;
- minimizing and adequately managing waste and hazardous chemicals;
- promoting an efficient management of resources;
- promoting sustainable procurement;
- reducing health systems' emissions of greenhouse gases and air pollutants;
- prioritizing disease prevention, health promotion and public health services;
- engaging the health workforce as an agent of sustainability;
- increasing community resilience and promoting local assets;
- creating incentives for change; and
- promoting innovative models of care.

Most of the principles adhere to creating more environmentally sustainable infrastructure in the healthcare industry. The document proceeds to offer vague suggestions for how each principle can be operationalized by supporting or making minor revisions of existing practices. The following is suggested for "promoting innovative models of care", lacking any sort of systems-oriented re-design:

- changing emphasis and improving coordination between primary, secondary and tertiary levels of care;
- encouraging the use of innovative technologies, including telemedicine, ehealth and mobile health; and
- changing clinical guidelines/standard operating procedures to reflect environmental sustainability.

In the quest to build a better living environment for all – especially for those with vulnerabilities or disabilities who have been historically marginalized, national public health strategies often fail to address the underlying social and economic structures that are the root problems. As national public health policies are drafted by governmental agencies operating under a larger socio-political context, the difficulties for the public health sector to go further upstream are apparent. In a later section, we see how various groups have taken the matter into their own hands in eco-community projects, experimenting with alternative socioeconomic systems to attain better health and wellbeing and caring for all.

Circular Systems Design

Design methodologies have rarely been utilized to draft public health interventions - including the provision of healthcare services - as public health is often under the scope of top-down policy and programming engines. Circular systems design responds to the complexity of systems, and helps drive comprehensive strategies that respond to interrelated issues across different actors and sectors. While the circular systems design approach is prevalent in circular economy literature and practice has been mainly used to redesign products and businesses, it offers a space to re-imagine the space of healthcare and healthcare services provision.

Circular Economy

The circular economy concept is rooted in theories of industrial processes and economic systems, aiming to reconfigure the traditional linear economy in which products follow the timeline of "produce-use-dispose," into a new circular system of production and consumption in which materials and resources are in use for as long as possible through re-use, recycling, repurposing, and other methods. The circular movement of materials illustrated in the circular economy concept mimics the biological metabolism of nature, where no materials are wasted per se, but are fed back into productive organs, thus regenerative.

The foundational principles of the circular economy are cross-derivative of concepts that have been gaining traction since the 1970s such as Sustainable Development, Green Economy, Performance Economy, Life Cycle Thinking, Cradle-to-cradle thinking, Industrial Ecology, and Ecodesign (World Economic Forum 2018). Current circular economy scholarship and activity focus on analysis in the field of industrial ecology in areas of industrial process planning and implementation, product design, recycling, and waste

management, with the overall goal of ecological sustainability (Merli, Preziosi and Acampora 2018).

Medkova and Fifield (2016) writes that "Design in the circular economy is complex and requires a transformation in thinking, to shift 'from the current product-centric focus towards a more system-based design approach.' In the Royal Society for the Encouragement of Arts, Manufactures and Commerce (RSA)'s action research project "The Great Recovery," the RSA worked closely with businesses and designers examining processes and educational tools to inform broader circular design implementation. The diagram below illustrates the exercises on life cycle and stakeholder mapping, showing the complex interacting elements that play into a product's entire life cycle. The circular systems design approach responds to the complexity of global supply chains and helps identify actors and processes that require intervention to enhance sustainability and circularity of material flows (RSA 2016). While such design processes have been used for manufacturing within the circular economy context, this can be adopted for the design of healthcare systems and interventions.

Figure 3: Four Design Models. RSA 2016.

Based on a detailed product-level modelling study, the Ellen MacArthur Foundation (2014) estimates a net materials cost savings of up to 19 to 23% of current total input costs if an "advanced" circular economy is implemented. The design of circular material flows can help capture significant cost savings and generate affordability if the benefits are captured by users/consumers. In the areas of health and social care where there is a consistent challenge of decreasing funds (King's Fund 2018), such cost savings can be significant. As explored in the next section, circular systems in production within eco-communities play an important role in creating a regenerative environment for the community in ecological as well as socioeconomic aspects.

Eco-communities and Health

Eco-communities are loosely defined as sustainable community projects that span from urban to rural ecovillage, eco-neighborhood to eco-city projects. Eco-community projects vary in their characteristics and governance, the use of automobiles, and technology. For most smaller scale projects such as ecovillages, the heart of eco-communities is the concept of mutual support and living as a community (Barton 2000). Permaculture and the production and consumption of food is also a significant aspect frequently found in eco-communities, as is community managed utilities. The Global Ecovillage Network (GEN) describes the whole systems approach of ecovillages in ensuring social, cultural, economic, and ecological sustainability – reflective of the sustainable development pillars (Global Ecovillage Network n.d.).

In a qualitative comparison of ecovillage approaches, Hall (2015) presents the following twenty elements of ecovillages that contribute to a high level of wellbeing:

• Pooled Economy	• Shared Work
• Limited Hierarchy	• Work-Life Balance
• Inclusive Decision Making	• Emphasis on Arts & Culture
• Conflict Resolution	• Child-cantered Perspective
• Inclusiveness	• Healthy Food
• Celebration	• Physical Activity
• Self-development Practices	• Physical Contact
• Deeper Personal Relationships & Openness	• Dimensioned Communal Group
• Ecologically Responsible Behaviours (ERBs)	• New Values & Common Worldview
• Proximity to Nature	• Environmental Activism

Hall further explains that the efficacy of ecovillages in providing wellbeing lies in the combination of built, human, social, and natural capital. The built and natural environment provides benefits associated with residents' working/living, infrastructure and mobility needs, and the access to nature and natural land-based resources. Human and social capital centric practices highlight community building, education, self-development, mutual aid, and work-life autonomy.

The following are two examples of eco-community projects which also provide health/care services – in this case for people with developmental disabilities:

Solheimar Ecovillage, Iceland

Soheimar Ecovillage was founded in 1930 by Sesselja H. Sigmundsdottir and is considered to be one of the oldest ecovillages in the world. While Solheimar was first founded as an orphanage, it has since evolved into a village of about 100 residents in total, with about 45 residents with developmental disabilities living permanently in the village (semi-funded by the Icelandic authorities), supported by social workers and care assistants onsite. There are also a number of arts workshops (pottery, crafts, candle-making, herbal workshop) onsite co-funded by the authorities and the village. Every year the village has a steady influx of volunteers from around the world to participate in various activities in the village, with the most popular being food production at Sunna greenhouse, one of the first places to practice biodynamic farming in the Nordic countries. The greenhouse sells its produce at one of Iceland's major supermarket chains as well as the village's local shop

Vala - which also sells the products made in the arts workshops. Located at the heart of the village is Graena Kannan Café, where many local and international tourists like to visit alongside the village's guesthouses – the village estimates 35,000 visitors annually (Miller 2018). Long-term and seasonal workers along with volunteers assist with the day-to-day operations of the village in the workshops to its various enterprises.

Camphill Communities

The first Camphill Community was founded in Scotland at Camphill House in 1940, with the goal to provide education and homes for children with developmental disabilities, following Rudolph Steiner's philosophy emphasizing self-expression. There are now about 100 Camphill Communities worldwide, all with their independent governance systems and different characteristics. Most communities have various arts workshops and permaculture gardens to provide therapy and food. Camphill Communities rely on the work of volunteers and co-workers (providing free boarding and a small living stipend) to support residents with special needs – they are sometimes supported by paid staff that are specialized in therapies and round the clock care for residents. Co-workers live long-term in the community, and many participate in the governance of the communities (Camphill 2020).

The New Way Forward: Integrating Sustainable Health and Care with the Physical Environment

Reflecting on the work and structure of eco-communities such as in Solheimar Ecovillage and the Camphill Communities, we propose the outline of a circular community – community care model:

The conventional medical-oriented user-provider services provision model as seen in the diagram below relies on service providers in supplying medical and care services. The consumer approach is a uni-directional linear model (as opposed to circular), where the user/consumer only has the role of receiving care, services, and products. Considering the medical/social spectrum where the "social" operates in the realm of the community as opposed to institutional medical services, the day activities and personal care of an individual that has additional needs effectively becomes part of a medical/care services repertoire.
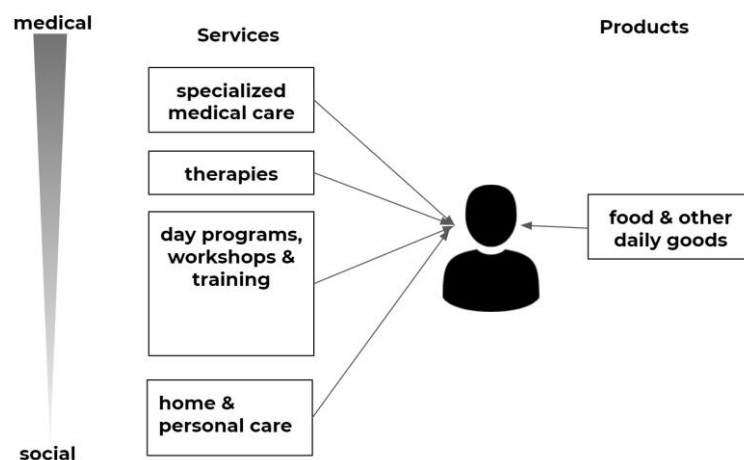

Figure 4: A conventional linear model of user-provider healthcare.

In contrast, we propose a circular community model that integrates the provision of care (services) with land-based assets. As illustrated in the right-hand portion of the diagram below, renewable community energy systems that channel into food and other modes of micro-scale production in the community are part of a loop to generate value and assets for the entire community. The activities of these sustainable industries are regenerative and contribute to creating a better physical environment for the community. On the other hand, therapies, day programs/training/education, are integrated with the productive value-generating activity of the enterprises – individuals with special needs that are traditionally only receiver of services are embedded to become part of an interactive system. Carers are not merely compensated service providers, but are crucial in the community, also engaging in other activities. The circularity of services and a community production system work hand-in-hand to support an autonomous community that is able to provide for its own needs. The paradigm shift nudges care services toward the community/social realm in favour of the normalization of individuals with special needs.
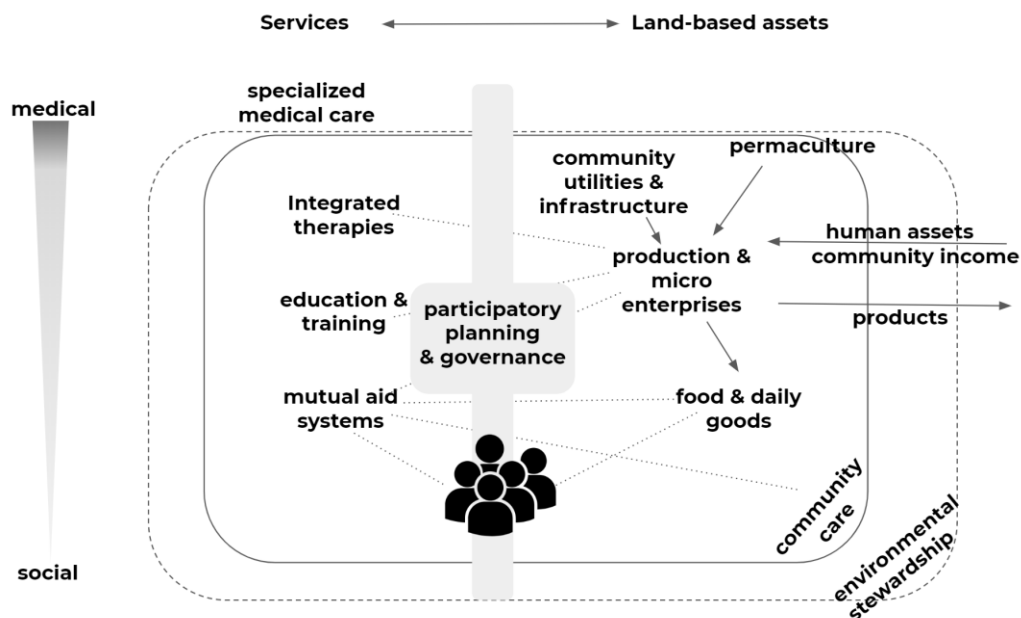

Figure 5: The proposed circular community model for health and care.

Further Research

As we have presented some of the justifications in using a systems design approach to rethink sustainable communities to provide health and care services, the outline of our design of what circular communities for health and care can look like serves as a scoping effort and is just a beginning. Moving forward, we aim to collect more data and map the relationships of concurrent healthcare service provision models to re-imagine the realm of sustainable health and care services to more detail. We plan to conduct comprehensive participatory action-oriented research with healthcare organizations as well as service users to explore the work in regenerative systems change.

Acknowledgements

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