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Development in Transition Essay

Circular Economy, Sustainable Cities, and Partnerships

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Lisboa, July 9, 2018

Revised on August 30, 2018

To: Professors: Olívia Bina, Mário Vale, Ana Horta
From: Pedro Neves
Date: (July 9, 2018) revised on August 30, 2018

Ph.D. Course: Development in Transition _ Essay

Essay 1st Title: **From Linear to Circular Economy,
How Responsible Consumption & Production (goal 12) impact Sustainable Cities (goal 11)**

Abbreviation: **Applying Circular Economy to Cities**

Revised Title: Circular Economy, Sustainable Cities, and Partnerships (August 30, 2018)

Word count: 5678 of 5945

Assignment: **Essay Topics (70%)**

The essay should critically address one of the themes covered in the unit.

Students must select themes from one of the 4 modules covered (this must be different from the module selected for the Book Review):

1. Transitions and planning in the Anthropocene (Book Review)

2. Urban development and governance challenges

3. Urban societal challenges | Unsustainable Consumption (Essay)

4. Ecological and rural challenges

Essay topics and questions should be agreed in advance via email with the member of staff responsible for each theme.

Module staff may agree to look over and comment on draft outlines of your essay structure but not on draft papers.

Essay Format

The essay should critically explore the issue you have chosen. It must be carefully researched, evidenced and argued.

Essays should be no more than 6000 words in length including all notes, tables and figures and excluding references. You are requested to state the word count of the essay (excluding references) at the end of your essay, and to submit both a word and pdf version.

Each file will be submitted by email to the member of staff responsible for the theme, and in cc to bina@ics.ulisboa.pt and mario.vale@campus.ul.pt

Essay Assessment Criteria

You will be assessed on:

- *Your ability to construct an original and critical argument*
- *Your ability to effectively review the range of perspectives that exist on the issue, developing arguments and counterarguments*
- *Your use and referencing of an appropriate range of relevant sources*
- *The organization and presentation of your essay.*

Due Dates and Times, and Penalty

*The essay must be submitted by the **09 of July 2018** by 17:00.*

Ph.D. Thesis: **How to implement Partnerships based on Sustainable Development (SD) to achieve the Sustainable Development Goals (SDGs)**

Independent variable → Sustainable Development (SD)

Dependent variable → Partnerships to promote SD

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Abstract

This essay examines the relation of sustainable development (SD), with the circular economy (CE), how CE can be applied to sustainable cities (SC), and institutions and partnerships can be used to implement them on real life. SD is challenging and interesting probably for the same reasons, it is complex, actual, it has an impact on citizens, protects the planet and requires financial and economic feasibility and viability plans. Understanding the concept is far less complicated than to put them into practice. An SD problem-solving equation will not be linear, and the variables and methods will change according to the challenges being addressed. CE has received support from the business sphere as well as from policymakers globally and particularly in Europe. By analyzing the characteristics that make CE successful, and that goes beyond product design and waste management optimization, this research looked for its application in urban development and management. Extrapolation is analyzed using three examples that address urban mobility; public health associated with water and wastewater management, and large urban regeneration program. In these cases, institutions designed solutions that were implemented with private sector participation. Successful outcomes suggest that further investigation relating to the circular economy, sustainable cities and partnerships should be developed as a positive impact on people, planet and economy are significant.

Introduction

On this essay three levels of research will be exploited with a top-down approach: Sustainable Development (SD) and the Sustainable Development Goals (SDGs) as an overall umbrella guiding general development policies; Circular Economy (CE) and Sustainable Cities (SC), and how CE can be used to influence and improve urban development and management; implementation involving the “rules of the game”¹ – institutions², and, the actors of the game – partnerships³, and how they can be used to lead the implementation of the concepts on the field. Within this perspective the essay hypothesis could be to test if SD and the SDGs can serve as a guide to positive transformation, whether concepts such as CE and SC can be linked to specific UN goals interlinked among them, and, how institutions and partnerships can be used to enhance implementation of development models based on SD.

The most common definition for SD is *“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”* (United Nations, 1987) that has been guiding SD definitions and that guided the development of the UN 2030 agenda, the Sustainable Development Goal (SDGs), approved by all UN member states in September 2015. The approach to SD is identified with three inseparable pillars: equity, environment, and economy, or in UN terminology the 3 “Ps” for people, planet, and prosperity. With the approval of the SDGs, a strong concern for implementation was brought to the agenda and two more Ps were added. The 4th “P” is for *Peace and Strong Institutions* and the 5th “P” is for *Partnerships* (UN SDGs, 2015). This means that besides the usual 3 SD vectors combining economy, environment and social, attention shall be given to implementation associated with institutions and partnerships. From the concepts of SD and the SDGs, the concepts of CE and SC will be exploited, followed by examples on how these concepts have been developed by institutions and partnerships, and how they can be applied in urban development and management.

Circular Economy, beyond the concept of reducing production-consumption

This section covers CE characteristics and how it relates to goal 12 of the SDGs *Responsible Consumption and Production*. Limitations of the concept will be addressed followed by outcomes originated by CE, and the challenges of extrapolating CE to SC.

Circular Economy concept comes from realizing that linear economy, based on *“Take–Make–Dispose”* (Ellen MacArthur Foundation, 2018), is not environmentally sustainable as the balance between the extraction of natural resources, and the ability of the planet to regenerate the outputs produced by man, is behind the natural capacity of our ecosystem. Not existing a clear definition for Circular Economy, it was opted to use the one created by Korhonen, Honkasalo, and Seppala, where

¹ Douglass North: institutions “are the rules of the game in a society, or more formally, are the humanly devised constraints that shape human interaction”

²Institutions referring to SDG goal number 16, Peace, Justice and Strong Institutions

³ Partnerships referring to SDG goal 17, Partnerships for the Goals

they relate production and consumption in terms of materials and energy used for the transformation process under a sustainable development approach.

“Circular economy is an economy constructed from societal production-consumption systems that maximize the service produced from the linear nature-society-nature material and energy throughput flow. This is done by using cyclical materials flows, renewable energy sources and cascading type energy flows. Successful circular economy contributes to all three dimensions of sustainable development. Circular economy limits the throughput flow to a level that nature tolerates and utilizes ecosystem cycles in economic cycles by respecting their natural reproduction rates.” (Korhonen, Honkasalo and Seppala, 2017).

Goal 12 focus on promoting economic growth associated with the efficient management of natural resources, indicating that present production and consumptions patterns shall change.

Decoupling economic growth from natural resource use is fundamental to sustainable development. Achieving economic growth and sustainable development requires that we urgently reduce our ecological footprint by changing the way we produce and consume goods and resources and promote the efficient management of our shared natural resources.

The targets associated with Goal 12, refer to management, planning, reporting, procurement, incentives of natural resources, and the outputs resulting from processing them, and their reintegration in nature. Considering CE is part of SD, the core of CE is the relationship between economic growth and the exploitation of natural resources. Considering the 5 “Ps” (people, planet, prosperity, peace&institutions, partnerships) of the SDGs, it could be said that focus is given to Planet and Prosperity.

The circular economy is recommended as an approach to economic growth that is in line with sustainable development and economic development (Korhonen, Honkasalo and Seppala, 2017).

The fact that CE is based on 2 “Ps”, out of 5 “Ps” can be considered a first limitation. Another aspect comes from seeing CE as a circular process, with two half circles. The first half circle is about designing products for consumption, the term *eco-design* will be used to consider the first half, and the second half circle is about reusing the products created and materials involved on production, the term for this second half will be waste management. The critics come from the fact that more attention is given to *waste management* than to *eco-design*, meaning more focus is given to optimizing what has been produced rather than to question the need of producing the objects in the first place, or to improve the process of reusing the objects or the materials involved in. Another issue is linked to the fact that CE is a new concept without, today, much scientific analysis. *The scientific and research of the CE approach seems to be only in its infancy* (Korhonen, Honkasalo and

Seppala, 2017). Being CE mainly related to products and consumer goods, mainly produced by the private sector, it is perceived as a private approach to SD.

The fact is *the circular economy has come to stay: all one has to do is to visit the web pages that European Commission devotes to the theme.* (Cardoso, 2018). Indeed, CE answers well to policymakers, particularly those involved with climate change and environmental policies and management, as it allows policymakers to have an eco-friendly speech, without having to invest or finance it, and indeed, CE potentially reduces the need for public investment, as pollution costs are reduced. It also answers well to the business sector, as it promotes economic growth, by promoting innovation, new products, being environmentally friendly.

doubly profitable perspective: lessens exposure to the risks of environmental deterioration and obliges the business sector to adopt a process of innovation, and creative destruction, new processes for the industry and new products (Cardoso, 2018).

CE brought more than an optimization between products and consumers, and several aspects deserve attention as they can represent important stepping stones for sustainable development to thrive. It has been developed based on the principle that economic growth is related to the production of products and their consumption from consumers, is the process associated with the optimization of designing products and managing their respective waste. Considering that it is possible to design products in a way that after its use, the products or their output will be re-used, the consumption of virgin materials is reduced. This approach solves the exploitation of natural resources with less effect on economic growth. The concept is also directly linked with addressing human satisfaction as it intends to guide consumers to focus on having the needs satisfied rather than possessing the objects required to satisfy those needs. It has therefore developed the concept of using instead of owning. Taking this to a broader perspective it means that needs can be satisfied with less allowing consumers to have “more with less”.

CE also reflects a new approach to problem-solving associated with Design Thinking (DT). This designers’ backward approach is based on three areas overlapping each other: desirability, feasibility, and viability (Paradis and McGraw, 2007) meaning that a solution needs to be wanted by users, to be buildable by the industry and to be economic and financially sustainable. Based on these areas, DT is a process that integrates “empathizing”, understanding the human needs; “defining” the problem in a human-centered way; “ideating” creating many ideas able to address the challenge; “prototyping” adopting a hands-on approach and producing an initial object; “testing” confirming the outcome is aligned with the output. (Dam and Siang, 2018). This fact is particularly interesting as although CE is focused on Planet and Prosperity, the DT approach being human-centered, humanizes the concept and brings the People angle to CE, although People are seen mainly as consumers.

Being CE mostly applied to consumption goods objects, produced in the industry where the majority of shareholders are from the private sector it can also be established a link between CE and the private sector. This is a sign of the private sector readiness to answer positively to environmental

agendas, namely when positive economic returns can be expected. Likewise, it is easier for the public sector to promote environmental policies that are aligned and can be developed by and with the private sector.

CE brought a new perspective to the relation between consumption and production and economic growth as instead of identifying the problem to be economic growth, searched for the causes of unsustainability, namely the continuous extraction of virgin materials and the incapacity for nature to absorb the type of waste is produced today. This perspective drives for consumption to be based on existing materials and for products to be produced with components that are absorbable by nature.

Other implications that go beyond product eco-design and waste management, is about the possibilities that can be extrapolated to non-products such as services and, to a conglomerate of products such as a city. One example is to satisfy the need of going from “a” to “b” usually implying a personal car without having to own it. On one hand, it could mean the use of public transportation, but it can also mean sharing the ownership of a vehicle, or even the right to use without owning it. This angle leads to a new type of relation between investors and consumers. This perspective implies new forms of cooperation and partnership not only between investors, lenders, and consumers but also between the public, private sector and civil society that can be exploited in a greater scale. If a public service that requires a certain asset doesn’t need to invest in the asset, because investment will be done by a third party, this will decrease the need for public investment. CE implies a mind-shift on consumers, as well as on investors and lenders and likewise on public service providers. A new window of opportunity is open, and will certainly be explored by the industry, consumers, policymakers and by the academy, and although it has started with products, it will certainly be used in different fronts.

Sustainable Cities, promoting urban quality of life while protecting the planet

The natural question becomes whether and how is possible to scale up and replicate the CE concept to a greater scale. Indeed, cities represent the territorial surface where most humans live, and therefore where most of the social, economic and environmental weight occur. For this reason, it can be defended that solutions applied to cities will have great impacts on the planet. According to UN-Habitat, *the urban population grew from 746 million in 1950 (29.6% of the population) to 3.96 billion in 2015 (54%) and it is expected to be 5.06 billion (60%). Today with 54% of the population, cities occupy just 3% of the Earths land and account for 85% of global GDP, 75% of natural resource consumption, and 60-80% of greenhouse gas emission (UN Habitat 2018).*

Although there is no clear definition of what a sustainable city is, there are common angles that are associated with it. The most simplistic approach focusses on inputs and outputs produced in a city.

Experts, as well as the dictionary, have yet to define what a sustainable city is, however, the general consensus is that it is a city that minimizes the inputs and outputs. Meaning, they use fewer resources and create less waste. (Delany, 2018)

This approach fits with the CE concept, as addresses, in particular, the Planet angle. Other definitions are broader and closer to the 3 inseparable pillars of SD. Haughton and Hunter follow this approach integrating cities in the territory and connecting them with regional development.

A sustainable city is one in which its people and businesses continuously endeavor to improve their natural, built and cultural environments at the neighborhood and regional levels, whilst working in ways which always support the goal of global sustainable development.

Enhancing urban economic and environmental self-reliance is a valuable and necessary policy direction for sustainable urban development, but total urban self-reliance may be neither a realistic nor a desirable goal. Taking this further, so well-connected are rural and urban areas that it can be reasonably argued that policies in pursuit of sustainable urban development always need to be framed together with policies for sustainable rural development. (Graham Haughton and Colin Hunter, 1994)

Looking at the UN SDGs, the challenges on the urban development and management fronts are human settlements, formal and informal, infrastructure, pollution, urban design, and planning.

Rapid urbanization has brought enormous challenges, including growing numbers of slum dwellers, increased air pollution, inadequate basic services and infrastructure, and unplanned urban sprawl, which also make cities more vulnerable to disasters. Better urban planning and management are needed to make the world's urban spaces more inclusive, safe, resilient and sustainable. (United Nations, 2018)

Considering the complexity of a city, the concept of *Circular City*⁴ would be to narrow down and not take other angles that are key to urban developers and to citizens in general. CE brought a way to converge economic growth by protecting the planet, it has shown linear approaches based on “take-make-dispose” aren’t sustainable, solutions can be optimized with the use of design thinking approaches, that “more with less” is possible and attainable, and that private sector adopts environmental agendas at least as they understand there is double profitable perspective.

Returning to cities and urban development, there are some key differences from consumer goods product development, the most obvious being size and with it the variety and complexity of products involved in a city, another difference comes from the fact that in a city, besides the products used by consumers, there are a great variety of services supported by products; another important difference is that it represents collective interest associated with public policies, public investment and the management of public services. In short, when CE is extrapolated to cities means that: *small* becomes *large*; *products* can also be seen as *services*; *private focus* becomes *public and collective focus*; and, *simple* is indeed *complex* (considering one object is simple compared to a city).

Using the *economist intelligence unit* yearly report on the “*world most liveable cities*” the analysis looks for factors such as stability, infrastructure, education, healthcare, and the environment, that lead to better community quality of life. To improve and provide better public services required to attain the quality of life demanded by citizens, transformation processes require urban investments

⁴ Concept presented by Ellen MacFoundation Circular City embeds the principle of a Circular Economy

on a large scale. When looking at all these factors, it can be perceived they all require the existence of assets that either ask to be developed or, will need to be improved and upgraded in the near future. This applies to mobility involving roads, rail, and metro, airports, and ports; utilities such as energy, water, telecom, gas networks; schools, hospitals, police and fireman stations, cultural and sports facilities; housing, retail, and office buildings. Infrastructure “latu sensu” and not just mobility infrastructure, represent all type of collective assets developed over territory that are man-made and have interesting characteristics. Shove, Watson and Spurling, describe some of them related to mobility infrastructure:

First, infrastructures are often (but not always) connective – linking different places; Second, typically sustain a range of different practices at once; roads accommodate cyclists as well as cars enabling journeys to work as well as to hospital or to school. Third, they are generally collective – more than one user; Fourth, infrastructures are often relatively obdurate. Infrastructures are characteristically resilient. and sustained by multiple social practices.

The observation that design and policy-making can work in both directions – reacting to trends in practice and/or providing conditions in which trends might take hold – leads to the more subtle proposition that methods of infrastructural development are themselves implicated in wider systems of practice dynamics.

(Shove, E. & Watson, M. & Spurling, N. 2015)

One characteristic about cities is that even if a decision is being taken under a certain angle, for instances road design, its impact will be greater than that related to the physical geometry of the road. For this reason, a holistic and integrated approach will have a different impact on how communities live. These types of assets have different investment profile as some of them are economic and financially self-sustainable. An office or a retail building should generate enough cash flow to pay back the investment and to provide positive returns to investors. On the other hand, public schools, healthcare facilities, as well as roads, bike lanes, and sewage networks normally do not provide per se financial returns, and therefore will not per se be developed by the private sector. This means that Urban Development and Management require solid Public Interest perspective as decisions have a long-term impact on communities and will define the City personality and attraction. Cities are, for these reasons, clear examples where Free Market rules do not apply, as short-term profit-driven decisions could disregard the urban ecosystem that has multiple functions that per se are not profitable.

Unlike a cell phone, a car, a cooking tool, a piece of cloth, or a food package, that is designed and developed by private sector companies, and where consumers can be more attracted, as the corporations behind these consumer goods adopt a circular economy approach. In these cases, the product lifecycle depends mainly on private sector strategy. The public sector may and should incentive this type of initiatives, but its involvement happens mainly at the policy level. City “goods” are very different as its components will impact how the city works and how citizens will live in the city. The lifecycle perspective of city “goods” or city “assets” require public design and planning, public service management, and therefore whether the development is done by public entities as could be the case of a public school, the management of public transport, or the real estate development of housing, retail and services, the output and particularly the outcome will have impact on the liveability⁵ of the city.

⁵ Oxford Big Ideas Humanities: “liveability” is generally measured by factors that provide quality of life, such as access to fresh water, food, housing, transport, healthcare, education, and a safe and stable environment.

These facts give city development and management, challenging governance options as they require public vision and strategy to be articulated with private dynamics. The degree of cooperation will vary in every city and according to each sector, but the interface will always exist, and the way this balance will be achieved will affect directly how investments will be attracted to the city, how businesses will be developed, and jobs created. As stated earlier, the private sector can be attracted to environmental agendas while developing their own products, the question is then to bring this spirit on processes, where public and private cooperation is required.

Sustainable Cities are living environments on a permanent process of transformation, involving multiple stakeholders. Some of these processes can be associated with the public sector, some refer to the private sector, but a great majority will require both. The geometry of these processes is variable but the more the vision, the strategy is accepted by all stakeholders the more likely a sustainable city is likely to be achieved. Cooperation is needed between public and private as the first has the legitimate power to define about the future of the city, to design and implement policies and the second has the capital, the dynamics and normally the flexibility associated with creativity and innovation. Articulation is needed between public and private, but also between central and local governments, civil society, the academy, and the industry. Considering a spirit of cooperation between different stakeholders and the willingness to achieve a common goal and adopt a common strategy, the term partnership will be used also to follow the SDGs terminology.

Partnerships, lessons learned from combining conflicts of interest

This section refers to three examples on three different locations, London - UK, Fortaleza in Brazil and Parque das Nações in Lisbon - Portugal, have used sustainable development approaches combining public interest and development policies, with, private capital and dynamics.

London, reducing CO2 emissions, improving traffic security, through private taxes

This example represents the willingness and need to reduce car traffic in the center of the city, and therefore to have people using public transport or bicycles. The concept was to reduce the use of products, reduce the use of energy, reduce pollution and therefore to manage waste avoiding its entrance in the city in the first place, and to have policies being designed to implement this goal, in this case, it consisted on creating a congestion charge. The impact was a cycling increase, reduction of accidents and key traffic pollutants.

It is in these terms that we consider the impact of London's congestion charging scheme. On 17th February 2003 the Mayor of London, Ken Livingstone, introduced a 'congestion charge' of £5 to be paid by people driving into a central charging zone on weekdays between 7.00 am and 6.30 pm. This scheme, which also included a parallel programme of investment in public transport, represents a highly visible, very deliberate, very political effort to reduce car use and congestion in the capital. Although represented here as a 'one-off' intervention, congestion charging constitutes one moment in a more ambitious endeavor – that of limiting car travel in London. As such it forms part of a longer-term process of reflexive governance even if not one that is explicitly presented as such.

Regarding the scheme itself, entry into the charging zone is policed by a system of cameras and the charge to cross the cordon, initially £5 and now £8 has apparently made a significant difference. Four years after the scheme was introduced, Transport for London reports that "when compared to conditions without the scheme, Congestion Charging is continuing to deliver congestion relief that is broadly in line with the 30 percent reduction achieved in the first year of operation". Transport for London also reports. . . "An increase in cycling within the zone of 43 percent and reductions in accidents and key traffic pollutants in and around the charging area" (Transport for London, 2007). Policy makers think the congestion charging scheme has made a difference and it is true, there are tangible consequences. Shove, E. & Walker, G. (2010)

Fortaleza, improving public health, through land use policies, creating solutions for low-income housing and a base for private initiative to flourish

The municipality realized that slums and informal settlements originate public health problems that needed to be addressed at the urban design level. By defining the urban grid and ensuring self-construction would be developed with access to a sewage network that would be compensated by the decrease of public health costs and an improvement of the quality of life.

*The **Municipal Sanitation Basic Plan (PMSB)** is the result of a series of studies that aims to know the current situation of the municipality of Fortaleza and to plan actions and alternatives for the **universalization of public sanitation services**, resulting in the promotion of sanitation, health public, and the environment.*

*The Main Related Policies are National **Health Policy**, on **Water Resources**; **Solid Waste Policy**; **Housing Policies**; on **Climate Change**; Risk Prevention; **Environment and Environmental Education**; **Combating poverty**; Promotion of **racial equality, gender**, among others.*

*The implementation of the PMSB ensures **impacts on society, especially**:*

- a) Improvement of health conditions, with impacts on health indicators, such as infant mortality;*
- b) Protection of the environment, especially water and soil;*
- c) Contribution to poverty reduction;*
- d) Urban, economic and social development.*

PMSB (2018)

The case study of Fortaleza, unlike the case of London driven by traffic and the environment, was driven by public health. In both cases, the product is the city, in the first case the infrastructure is associated with mobility, on the second case infrastructure is associated with the water cycle and more specifically with the wastewater network. The public health initial motivation created the basis for land management to be improved and, for reliable low-income housing solutions to be adopted by citizens.

Lisbon, beyond large-scale eco-design and waste management, applied to urban renewal

In Lisbon, an invented city – Parque das Nações, was developed after 1992 and a world benchmark on urban regeneration was created. In this case, the product is not a linear infrastructure such as mobility or a wastewater network but the territory. The land was a wasteland and the process consisted of reusing the land and give it a liveable function. East Lisbon (Lisboa Oriental) was a Not In My Back Yard (NIMBY) area with all type of assets and services not wanted in a city, namely: an

oil refinery, slaughterhouse, informal waste depot, associated with prostitution and drug trafficking. The concept of waste management went therefore further than air or wastewater and included, solid, gas and liquid pollution associated with social pathologies. Again, the concept of managing waste and recycling it improving the output, and inducing an outcome that has a social, environmental and economic impact on the city and the country. In this case, it is applied on a large scale and involved policy design including the creation of new institutions that worked at multi-level was multidisciplinary and involved all stakeholders possible to generate an example of circular economy applied to cities.

Circular Economy combined with SD shows how a product approach can be applied to cities namely how the principle of improving the existing outputs by recycling them into new products or services by using an eco-design approach, to improve not only the eco-footprint but enhance the economy and promote social cohesion. It has observed the interest and added value to mix urban policymakers with the eco-design to develop strategies.

The examples of London, Fortaleza, and Lisbon can be analyzed with three angles. The first relates to the application of a CE and how the concept usually applied to products can be used on a larger scale to cities. The second with the level of sustainability involved, and how a Planet driven perspective can leverage a broader sustainability view involving SD, including people, planet, prosperity. The third is about the level of intervention of stakeholders; Institutions involving public organizations and state, and, partnerships involving multiple stakeholders. The three angles reflect the interconnectedness of sustainable development namely how CE can be applied to cities and products; how SD integrates CE approach and the importance of combining institutions-the rules of the game, with partnerships-the actors of the game.

When the three examples are analyzed a pattern can be identified. In all cases, the process is city driven. The goal in the first case is to improve traffic in the center of London, the second case to enhance the public health in the informal settlements of Fortaleza, and the third to turnaround and upgrade a Lisbon district to a liveable community environment. The strategy in all cases is also SD driven, meaning that impact is aimed at the social, environmental and economic angles. CE is, therefore, part of a broader SD approach where waste management and eco-design are a part of the process. The implementation also occurs first at an institutional level involving policymakers and development policies and then partnerships, become actors of implementation.

From these examples the following relations can be identified: circular economy can be considered as part of sustainable development and it is directly related to the SDGs, namely goal 12 “responsible consumption and production”; by understanding consumers, producers, and policymakers, environmental impacts can be measured on consumption, production, and policy and developers, and therefore a "backward" design thinking methodology may enhance considerably the development of alternatives to an unsustainable linear economy; a product approach may be scaled up and replicated to the territory and to urban development and management. Examples based on

real-life experience are appropriate as a research methodology as they allow to integrate, test and develop different concepts.

Conclusion

The research topic applying Circular Economy to Sustainable Cities through Partnerships should be developed further as it has great impact on the quality of life of communities, can contribute to reducing the eco-footprint and it represents a way to promote economic growth without increasing the exploitation of virgin natural resources; CE is aligned with Goal 12 in particular and aligned with SDGs and can be used for products as well as cities; Partnerships are a way to involve multi-stakeholders over implementation; Case Studies as a Research Methodology are a way to contribute for policymakers to adopt new development policies namely involving CE and SD; CE and SD can contribute to the achievement of the SDGs.

While developing this research the following areas were addressed, and further research could be developed on each of these fronts:

Sustainable Development requires a mind-shift on how humans perceive, relate and impact the environment, changes in how we produce and consume, are just the beginning of a greater interface between humans and the eco-system;

Sustainable Cities are more likely to fight poverty, promote gender equality, decent jobs, reduce inequalities and have peace and justice;

Innovative forms partnerships involving multi-stakeholders and strong institutions are key to drive such a transition.

References

- Borrego, C. (2018 p.50) Ingenium Março 2018 Economia Circular
- Cardoso, J.L. (2018) The Circular Economy: Historical Grounds
- Dam and Siang, (2018) 5 stages of design thinking <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process>
- Delany, G. (2018) lessons on sustainable cities, <https://study.com/academy/lesson/sustainable-cities-definition-design-planning.html>
- Economist Intelligence Unit (2018) <http://www.eiu.com/topic/liveability>
- Ellen MacArthur Foundation (2018) <https://www.ellenmacarthurfoundation.org/circular-economy/overview/concept>
- Geels (2010) Ontologies, socio-technical transitions (to sustainability), and multi-level perspective
- Gopel, M. (2016) The Great Mindshift
- Haughton, G. & Hunter, C. (1994) Sustainable Cities _ Regional Development and Public Policy Series, University of Cambridge
- Korhonen, J. & Honkasalo; A. & Seppälä, J. (2016) Circular Economy: The Concept and its Limitations
- McMeekin, A. & Sotherton, D. (2012) Sustainability transitions and final consumption: practices and social-technical systems DOI:10.1080/09537325.2012.663960
- Neves, P. (2018).
http://www.unece.org/fileadmin/DAM/ceci/documents/2018/CICPPP/Presentations/Pedro_Neves-Goal_12_-_Goal_11_from_demand_to_supply.pdf
- North, Douglass. C (1990), *Institutions, Institutional Change, and Economic Performance*, New York: Cambridge University Press.
- Oxford Big Ideas Humanities (2018) https://www.oup.com.au/_data/assets/pdf_file/0030/58179/Chapter-5-Liveable-cities.pdf
- Paradis, McGraw, (2013) Naked Innovation http://nakedinnovation.com/wp-content/uploads/2013/09/NakedInnovation_Chapter02.pdf
- PMSB (2018) <https://urbanismoemeioambiente.fortaleza.ce.gov.br/infocidade/364-plano-municipal-de-saneamento-basico> (2018)
- Shove, E. & Watson, M. & Spurling, N. (2015) Conceptualizing connections: Energy demand, infrastru, e and social practices DOI:10.1177/13684310015579964;
- Shove, E. & Walker, G. (2010) Governing transition in the sustainability of everyday life DOI:10.1016/j.respol.201001.019
- Stockholm Resilience Center (2018) <http://www.stockholmresilience.org/research/planetary-boundaries.html>
- UN Report of the Secretary-General (2017), *"Progress towards the Sustainable Development Goals*
- UN SDGs (2015) Transforming Our World
- UN-Habitat (2018) <https://unhabitat.org/wp-content/uploads/2016/02/SDG-Goal%2011%20Monitoring%20Framework%2025-02-16.pdf>
- UNECE (2018)
http://www.unece.org/fileadmin/DAM/ceci/documents/2018/CICPPP/Official_documents/ECE_CECI_2018_1_Rev.1_1804447E.pdf
<http://www.unece.org/index.php?id=47613>
- United Nations (1987) <http://www.un-documents.net/our-common-future.pdf>
- United Nations (2018) SDG11 <https://sustainabledevelopment.un.org/sdg11>
- United Nations (2018b) SDG12 <https://sustainabledevelopment.un.org/sdg12>
- Wikipedia (2018) https://en.wikipedia.org/wiki/Circular_economy