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Collaboration as an Enabler for Circular Economy: A Case Study of a Developing Country

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Abstract

Purpose – Our research is dual focused. First, we advance the knowledge of Circular Business Models over linear models by focusing on new dynamics which are unique to developing countries. These dynamics have mostly been overlooked by contemporary literature. Second, we bring to the fore aspects of human-sphere which are currently under-researched in the circular economy (CE) domain. Therefore, our research explores how collaboration can facilitate the transition of a developing country's economy through the creation of value from circular business models and human-sphere.

Design/methodology/approach – To fulfil our research objectives, we apply Natural Resource Based View (NRBV) theory to an in-depth case study. We draw our data from semi-structured interviews and observations in North African manufacturing companies.

Findings – Our analysis found multi-stakeholder collaboration to be an important antecedent to CE implementation in a developing country context. Furthermore, we found multinational companies who implement CE business models generate a beneficial symbiotic relationship with local businesses. These benefits mainly revolve around technology transfer and organisational learning which is necessary for resource efficiency and clean technology - the basis for CE. Therefore, to advance knowledge and practice in this area, we propose a model for collaboration as an enabler for CE.

Practical implications – We argue for the importance of collaboration in advancing CE practices which can yield tangible benefits for developing economies.

Originality/value – This paper helps address the lack of theory driven research in CE. Our paper is a pioneer in this research field as it proposes a theoretical framework for collaboration in CE drawing on from NRBV.

Keywords - Circular Economy, NRBV, Resource Efficiency, Clean Technology, Human-Sphere

1. Introduction

The world population is continually growing, consequently increasing the middle-class, hence, both industry and policy-makers in developing economies must consider new concepts to limit the negative impacts e.g. depletion of natural resources (Tang, 2018). These negative impacts are continually exacerbated by high demand and increases in consumption of already depleted natural resources (De Angelis et al. 2018). Thus, both scholars and policy-makers are increasingly paying attention to the possibilities of transition from current linear models to circular economy (CE) business models (Geng and Doberstein, 2008; Koh, et al., 2017; Jakhar, et al., 2018) for economic and social, environmental development (Zhijun and Nailing 2007). Hence, major global businesses like Google, Unilever, Renault, Ricoh, Caterpillar, Michelin, Vodafone, etc., and policymakers e.g., inter-Governmental agencies, and the academia (Amid et al. 2006) are increasingly focusing on this concept. Transitioning to a CE is not limited to adjustments aimed at reducing the negative impacts of the linear economy (Ellen MacArthur Foundation 2015) instead, it represents a systematic shift to building long term resilience, generating business and economic opportunities and providing environmental and social benefits (Geng and Doberstein, 2008; Gaur, et al., 2018). According to Planning (2015), transitioning to a CE draws attention to four business fundamentals; materials and product design, new business models, global reverse networks, and enabling conditions (Yuan et al. 2006). It is important to note CE is not a new concept and has physically been practiced, however, its only recently beginning to receive acknowledgement in literature (Andersen 2007).

Most research has, however, focused on developed countries which has consequently created a gaping hole of the phenomenon from developing countries' perspective (Jabbour et al. 2017). Scholars recognise the gap hence, there have been a steady increase in studies focusing on specific countries, e.g. China (Goyal et al. 2016), Pakistan (Agyemang, et al., 2018) and India (Singhal D, et al., 2019). However, many aspects of CE from a developing country context remain under-researched hence our paper aims to fill this gap. Developing countries contribute a huge proportion of the global surface temperature, creating negative consequences for the global environment (Andrić, et al., 2018). This is evident as research indicates nearly two-thirds of the total industrial greenhouse gases, carbon dioxide and methane emissions, emanate from major industrial carbon producers in developing countries (Narayan and Narayan 2010). In addition, it is important to note the majority of the world's population resides in developing countries (Goyal et al. 2016). This population growth is driving an increase of natural resources demand; hence, a more efficient way of resource usage is needed in some developing countries (Tang, 2018). In addition, developing countries encounter more

resource constraints due to various reasons for example, limited economic capacity (Geng and Doberstein 2008). Therefore, our study aims extend knowledge in this research area by building on emerging research in this field e.g. Masi, et al., (2018) examined 77 companies using a survey-based study, Mishra, et al., (2018b) focused on developing and testing indicators. Therefore, we go deeper by conducting a single case study to unearth the taxonomy of practices and enablers of CE.

CE has become an important step further from closed loop supply chains (CLSC) and it plays a critical role in reducing waste and increasing product value (Kumar, et al., 2018). Therefore, CLSCs play an important role in capturing opportunities to, recycle component materials, enable remanufacturing and repairs (Mishra et al. 2018). According to De Angelis et al. (2018) collaboration plays a vital role in CLSC throughout the whole value chain which includes all areas from, buyer-supplier relationships, SMEs integration and costumers' awareness. However, our comprehensive literature review has indicated that due to lack of knowledge regarding concepts of collaboration issues and economy, many organisations are struggling to adopt CE (Jabbour et al. 2017). The collaboration between all stakeholders means the process of engagement in strategy design by combining principles and looking at the strategy of the business is important. These aspects allow the redesign of the company's strategy (Nakakawa et al. 2010).

Despite growing research focusing on the implication of SCM and CE (Mishra et al. 2018; Geng et al. 2013), there still is a gap of research fully exploring and explaining the importance of collaboration as an enabler for the CE, in developing countries (Belasen and Belasen 2016; Mangla et al. 2018). Hence, our research aims to fill this gap by exploring this issue and bringing to the fore the neglected areas of focus. Despite, companies in developing countries increasingly using CE principles, there is still a gap that fully captures all the facets of this concept (Sharma, et al., 2019). Furthermore, research focusing on developing countries is largely skewed towards the Chinese context (Meixell and Luoma 2015). Hence, our research aims to fill this gap by investigating collaboration for transition towards CE in a developing countries context. A key concept of this research is the 'Human-Sphere' which focuses on integration of humans in the cycle of transitioning towards CE (Geng et al. 2013). Humans at any stage can be a barrier to CE and studies are beginning to explore the human sphere from different perspectives (Singh & Giacosa, 2018). Hence, the main aim of our research is to investigate, how businesses operating in developing countries can transition towards CE through collaboration? Furthermore, our paper attempts to uncover the main drivers for business to transition towards CE in

developing countries. This is important, as to date, only a few researchers have focused on CE in a North African context (Goyal et al. 2016). Therefore, to fulfil this research gap we conducted a case study of a global manufacturing company operating in the fast moving consumer goods in North Africa. Our research explores the human-sphere aspect in CE, we explain how collaboration among multiple stakeholders along the supply chain is important in capturing value. Therefore, we proffer a model for collaboration as an enabler for CE to advance knowledge in this research area.

The remaining paper is structured as follows: in the next section we will highlight the current state of literature in CE including theorem, we focus on the natural resource-based view (NRBV) theory. Section 3 will discuss case study in more detail and justification for methodology choice will be provided. Findings from the project will be stated in section 4, followed by discussion in section 5. Section 6 concludes the paper and clearly states the overall findings.

2. Literature Review

2.1 Circular Economy and Supply Chain: Circular Supply Chain

CE is defined as an economy that is "restorative and regenerative by design" (Ellen MacArthur Foundation 2013). Additionally, it relies on the basic of someone's waste is a resource to someone else (Pinheiro, et al., 2018). Thus, CE involves a high degree of complexity as it encompasses all activities from extraction to production and beyond (Ghisellini, et al., 2016). Moreover, CE is an economy that aims to keep the value and utility of components, materials and products at their highest by creating the regenerative and restorative design (Howard, et al., 2018; Kumar, et al., 2018). It also requires the development of a new business model, such as "reduce-reuse-recycle", to help circulate and keep the value of natural resources for the long-term (Jabbour et al. 2017). CE involves the adoption of new business models, capabilities, and networks (Agyemang, et al., 2018).

However, this may be a major challenge especially in established organizations that are deeply rooted in the linear model for their operations (Bag, et al., 2018). In addition, it can be a costly and risky endeavour to switch an operational linear business model to a functioning CE (Ellen MacArthur Foundation 2015). According to literature CE is an attractive viable alternative to business as it can

lead to better management of resource risk and value creation (Batista, et al., 2018). CE is an economy designed to preserve and enhance natural capital and optimise resource yield by managing finite stocks and renewable flows (Yang, et al., 2018). To keep materials in the loop for longer and to better management of resources, supply chain needs to be effective and efficient (Webster 2013). Circular Supply Chain (CSC) is thus, an important aspect of CE that needs to be addressed (Govindan & Hasanagic, 2018). CSC is the integration of CE and CLSC that have been merged to create value (Mishra et al. 2018).

CSC is vital to businesses where resources enter an infinite loop of re-use to be re-manufactured and recycled each time (Genovese et al. 2017). This design of the supply chain operations enables circularity by encouraging the continuous flow of products back to its productive systems (Gaur, et al., 2018). In addition, the creation of the CSC is an expansion to the sustainability perspective (Braun et al. 2018; Koh, et al., 2017). CSC considers a value-creating chain from by-products, waste flow products and end of life returns, which eventually improve the circularity perspective (Braun et al. 2018). To have a transition from the regular supply chain to circular, an important element should be satisfied; "the power of keeping in the loop longer" i.e. increasing the life of the materials (Ellen MacArthur Foundation 2015). This is achievable through collaboration that enables concepts such as extending products durability, increasing the number of times the materials are being used for reproduction in addition to the repairing and recycling etc. (De Angelis et al. 2018). Moreover, to create a closed loop system, a CSC should be able to deliver value and functionality as opposed to product ownership between its customers (Braun et al. 2018). The latter cannot happen without the cooperation of consumers with the organizations (Singh & Singh, 2018). Speakman and Davis (2016) highlight collaboration across industries as "increasingly challenging to ignore" and hence will be discussed in the next section.

2.2 Collaboration and Circular Supply Chain in Developing Countries

Different scholars have attributed collaboration to different benefits (Dubey, et al., 2018). For instance, from an economic view point, companies' collaboration leads to cheaper sourcing, avoiding disposal costs, and/or gaining extra profit from selling the by-products (industrial symbiosis) hence, improved organisational performance (Schwarz and Steininger 1997; Vachon and Klassen 2008). Furthermore, environmental benefits associated with collaboration include reduced natural resource consumption, waste disposal reduction, and reduction of emissions to air, water and soil (Schwarz &

Steininger 1997; Chertow & Lombardi 2005; Jacoben 2006). Collaboration is viewed as an enabler to superior performance in firms due to capitalization on resources, capabilities, process and routines residing in partner's firms (Kahn et al. 2006; Fawcett et al. 2012). Collaboration is required for internal integration to improve an organisation's efficiency in their supply chain activities (Simatupang and Sridharan 2002). Shared understanding of environmental planning (Ghisellini, et al., 2016), working together to reduce pollution and use resource efficiently and by setting a joint environmental goal (Daniels and Walker 2001) are few examples of organisational collaboration.

Therefore, organisations collaborate to achieve environmental sustainability across the supply chain (Vachon and Klassen 2008). However, it is not easy to implement, as there could be failure to understand when and with whom to collaborate. Moreover, lack of trust between partners may lead to difficulty in collaboration (Barratt 2004). Literature states the importance of collaboration in CE as it tackles increasing consumption, urbanization and employment issues, by creating a movement that encourages stakeholders, beyond the company, to act circular (Aidonis and Folinas 2017). To enable the shift from traditional supply chain, with a linear "take, make and dispose" model, towards circular model, stakeholders need to work together through the value chain (Wood and Gray 1991). However, there is limited research investigating collaboration in the CSC context. Furthermore, to date, research that has been done in collaboration within supply chain, and CSC is mainly conducted in Western Europe and North America with developing countries underrepresented (Yuan et al. 2006) even though the collaboration failures that are experienced in the supply chain are mainly in the developing countries (Mangla et al. 2018).

In developing countries, successful collaboration could create joint competitive advantage which could lead to value creation; this in turn could create collaborative advantage to all partners (Cao and Zhang 2011). Furthermore, the challenges faced by companies in these countries such as the difficulty in delivering consumer goods, lack of advanced technology, resource scarcity and logistics parries, can be overcome by collaboration (Amores Salvado 2013). Thus, this research focuses on Northern African context to add value to literature in collaboration in the supply chain. Moreover, although human aspects are often highlighted to be most resourceful in CE, there has been limited research in this sector (Singh and Singh, 2018). Humans are found to be the common link between the resources and the technical world to adopt CE model (Lemille 2016). Thus, in this research collaboration as an aspect of human-sphere will be investigated for circular supply chain in the developing country context.

2.3 Natural Resource Based View (NRBV)

NRBV could be used to understand collaboration in supply chains (Choi & Hwang, 2015). It analyses different types of innovations that an organization can adopt to tackle environmental issues (Alt et al. 2015). There are growing challenges posed by the natural environment examples include, growing population, the global consumption of fuel increased and the increase in the industrial production in general (Amores Salvado 2013).

These examples are contributing to a growing negative environmental impact such as air and water pollution, toxic emissions, industrial accidents etc. (Ellen MacArthur Foundation 2015). Therefore, following previous research (Choi & Hwang, 2015) this study applies NRBV as an appropriate theoretical lens to tackle the gap in research relating to environmental constraints and creation of competitive advantage (Hart 1995; Hart and Dowell 2011). NRBV will be an appropriate and effective theoretical lens in explaining the engagement of whole value chain and the integration process of material reuse and recycling in the design, production and delivery of a product (Meixell and Luoma 2015; Touboulic and Walker 2015). NRBV puts forward three strategies that lead to a sustainable competitive advantage: pollution prevention, product stewardship and clean technology (Miemczyk et al. 2016). Each of these is driven by different forces and led to key competitive advantages.

Pollution prevention strategy deals with the control of waste and its minimization, by storing, retreating and even reusing it (Ellen MacArthur Foundation 2015). Within this strategy there is resource efficiency that deals with implementing feasible and effective measures to deal with consumption of energy, water and other material and resources, to deal with material scarcity (Miemczyk et al. 2016). Product stewardship go even further than pollution prevention by expanding its scope to include stakeholder engagement in the entire value chain of the firm's product systems (Hart and Dowell 2011a; Amores Salvado 2013). Nevertheless, this research does not use this strategy as it uses collaboration and stakeholder engagement in the strategies that do not focus on that aspect (Miemczyk et al. 2016). Clean technology (CT) stands for more radical technologies that have potential to revolutionize entire industries (Hart and Dowell 2011a). It was presented to face the challenge of global sustainability by creating a competitive advantage through having clean technology that works with human hand-in-hand to satisfy productions needs without straining the planet's resources (Acemoglu et al. 2016).

The other strategy that deals and focuses its strategies beyond "greening" is the sustainable development that implies the long-term commitment to market development and investment (Hart 1995; Hart and Dowell 2011a; (Latan et al. 2018; Lucianetti et al. 2018). However, this research uses "clean technology" strategy to investigate on the aspect of innovation and design in the focal company.

2.3.1 Natural Resource Based View in Circular Economy Transition

In CE materials are integrated into the economy in a manner that they can be recycled regularly at high value (Ellen MacArthur Foundation 2012). This implies that materials should be preserved and cascaded in the supply chain for as long as possible (Vanegas et al. 2018). Additionally, the pillar also indicates that processes should co-integrate "economic, environmental and technological & social aspects" (Liguori and Faraco 2016). On the other hand, CE deals with Resource efficiency (RE) by the restorative and resource efficient designs (IFC 2012). Moreover, it reduces the quantity of inputs needed by simply putting less which is the Pollution Prevention (PP). It deals with preventing waste and is associated with "lower costs". The PP aspects are summarized in lowering the inputs required and simplifying the process and thus, being resource efficient (Graham and McAdam 2016). These PP aspects relate to "reduction, lifetime extension, reuse, remanufacturing and recycle" model (Liguori and Faraco 2016) which in CE terms are "resource efficiency" strategy.

Another concept CE promotes is the energy saving, i.e. another pillar of CE mentions "all energy is based on renewable sources" (Liguori and Faraco 2016; Kirchherr et al. 2017). This latter includes remanufacturing, the use of reusable products and materials which all result in a longer life-cycle (Ellen MacArthur Foundation 2012). Likewise, the clean technology also aims to reduce energy which occurs through innovation (Hart 1995). Hence, mapping NRBV with CE could be as shown in the table below. Extant literature has identified a gap in the literature about CE practices in integration with cleaner production practices (Braun et al. 2018) i.e. the relationship between how to achieve circular benefits using clean technology has not been studied in deep especially in developing countries (Braun et al. 2018). Our focus is to find what stakeholders are doing in a company to achieve green products, innovation and processes, and how the use of energy and material reduction is helping to build CE model. Thus, in this paper we explore how developing countries could create value from the circular business model and the role of collaboration, as human-sphere, towards this transition.

3. Methodology

This paper uses the case study approach (Yin 2003) based on a single case study in a North African country. The case was selected to highlight the importance of collaboration within emerging economies in moving toward circularity (Vaiman et al. 2012). An in-depth case study for a manufacturing company in fast moving consumer goods is chosen. This method is the most powerful research method in operations management (Voss et al., 2002). Collaboration in CE is a new sector and hence explorative study is deemed to be important (Yin 1994). Multinationals in developing countries lack information in researches, therefore more research must be done within this continent. Finally, the case study method is the ideal method to understand how the CE model is applied by certain multinationals. This method will help other companies in the same industry apply the CE model and to understand how the framework is helping in the dilemma of resources 'scarcity.

3.1 Context

A case study research is chosen for a company working in fast moving consumer goods in North Africa to study in-depth the sustainable strategy applied since 2010. In 2010, with the change in CEO/Top Management of the Company HQ. The home-company changed its Business Model to take CE definition: "Reduce, Re-use, Recycle". In the same year the local company shared its waste report before the new Business Model with SMEs to help implement new projects to reduce waste. The company has an ambition to achieve "zero waste to landfill" by 2020, and to help other companies achieve it. The product chosen is produced and recycled at its production site. The authors chose this company as it is one of the few organizations that are applying CE Principles in developing countries. Twenty stakeholders were approached and thirteen were interviewed as shown in Table 1. This is triangulated by observations and accessing meeting reports and other documents. Before the collection of data, an observation was done to understand the process. The observation was structured i.e. it was done with the objective of understanding the phenomena of "Circular Economy Business Model". Field notes, videotapes and audiotapes were taken. One of the authors conducted an observation which was done over one week. Interview questions were designed based on the state-of-the-art research papers; the questions are semi-structured.

Data was analysed using thematic analysis techniques, which helped in producing a list of themes, patterns and codes from the textual data (Saunders et al. 2009). The data collected was transcribed then put into a mind-map to drive on similar information pattern. Hence, a similar pattern was

clustered together to produce meaningful information. This research has some limitation that could not be avoided. For example, some of the interviewees were new to their position; therefore, they did not have a full knowledge of what was happening. The go-to-market managers worked in a separate region than production managers, thus, the information shared by them might have been outlined or not fully relevant.

Table 1. Interviewee Profile

Interviews	**Name of Position in the Company**	**Total years' number of experience in the company**	**Total years' number of experience in general**
IW1	Country Demand Planner	2 years and 7 months	3 years
IW2	Supply Planning Assistant Manager	4 months	18 months
IW3	Supply Chain Manager	6 years	6 years and 6 months
IW4	Project Manager	3 years and 2 months	5 years
IW5	Supply Planner	2 years and 7 months	4 years
IW6	Quality Manager (Go to Market)	2 years and 10 months	3 years
IW7	Factory Quality Manager	1 year and 10 months	4 years
IW8	Procurement Operation Assistant Manager	2 years and 3 months	3 years
IW9	Site Environment & Security specialist	13 years and 11 months	14 years
IW10	Safety, Health and environment Manager	2 years and 10 months	5 years
IW11	Procurement Operations Manager	1 year and four months	2 years
IW12	Brand Building Manager	1 year	3 years
IW13	Customer Service Coordinator	1 year and a half	3 years

4. Findings and Analysis

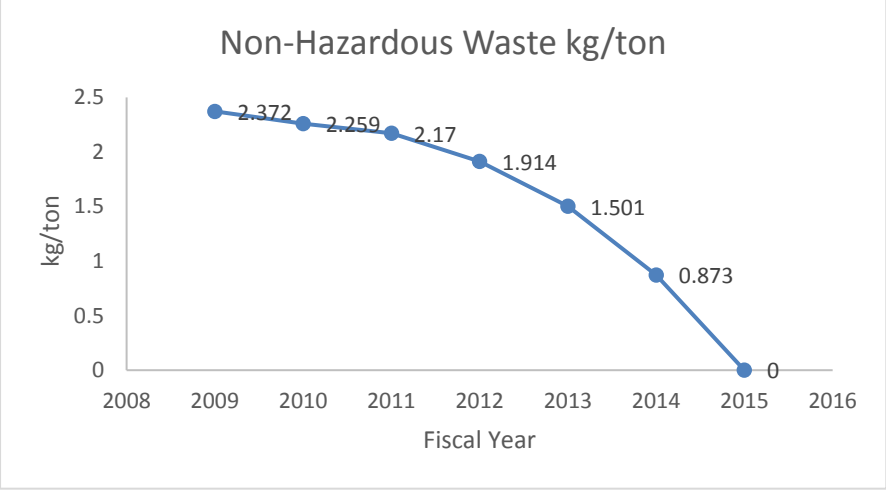
From the data analysis, we found that collaboration is required for buyers-supplier relationships and for logistics optimisation which in turn would result in resource efficiency. Similarly, multiple stakeholder involvement (SMEs, Government) was deemed to be an important factor for clean technology. Overall, collaboration was an important aspect that was found to enable an organization towards circularity.

4.1 Resource Efficiency Strategy

Resource Efficiency and wastage reduction could be achieved by responding to the country's environmental regulations at first, and by ensuring that the toxic materials are removed, or not included, in the early stages of product design. Nevertheless, to achieve these objectives, the collaboration in a company must exist, such as a good supplier-buyer relationship which will be discussed in the next sub-categories.

Since 2015, the focal company had started implementing the "reduce, reuse, recycle." Business Model (BM), which brought positive results (Figure 1) to the focal company. The focal company recognized the importance in collaborating with local parties, as some of its materials such as wood (pallets) was brought from global suppliers and it cannot be sent again for reuse/recycling because of cost efficiency reasons.

Figure 1. The waste reduction diagram



4.2 Clean Technology

The selection of the right supplier for collaboration and improving resource efficiency was found to be important. As highlighted by interviewee IW12: "…We make sure that our suppliers comply to the "zero waste to landfill" by conducting audits…This encourages all our parties to act within the circularity plan our company tries to achieve within a global context…"

Essentially, the focal company may not achieve circularity alone. Suppliers need to commit to the concept too. The focal company however, works with their suppliers to ensure that they comply to their strategies as highlighted by IW9.

IW9: "…We do send our suppliers to be "Sustainable Living Plan" certified by a 3rd party if they are already compliant to our standards, so we can work with them…They also have to comply to "zero waste to landfill, where they have to use renewable energy when it is possible, they have to reuse their waste or recycle it and they make sure that the papers they are using able to be re-used and not wasted…". Nevertheless, to achieve the circularity objective of resource efficiency other aspects should be achieved such as logistic optimization that is discussed in the next section.

Based on the findings, the suppliers take actions such as optimization of distribution routing due to collaborative work with their partner, which ensure energy saving, and hence circularity. As one of the Circular Economy Principles is to save and use clean energy and renewable resources "all energy is based on renewable sources".

To save carbon, the focal company optimizes the transportation impacts by studying the circuit suppliers need to pass by to deliver raw material to all its buyers. The circuit studied is given to suppliers which help in both cutting costs for all partners and saving environment.

An interviewee said, IW2: "…However, the suppliers when they send their material to our company, they ensure to use the most optimal circuit to pass through all their clients and go back and this is an external process…" Another one added, IW3: "…Secondly, it is a global freight, which reduces the environmental impact". These findings are associated with principle of saving energy and preventing waste and hence in turn energy usage.

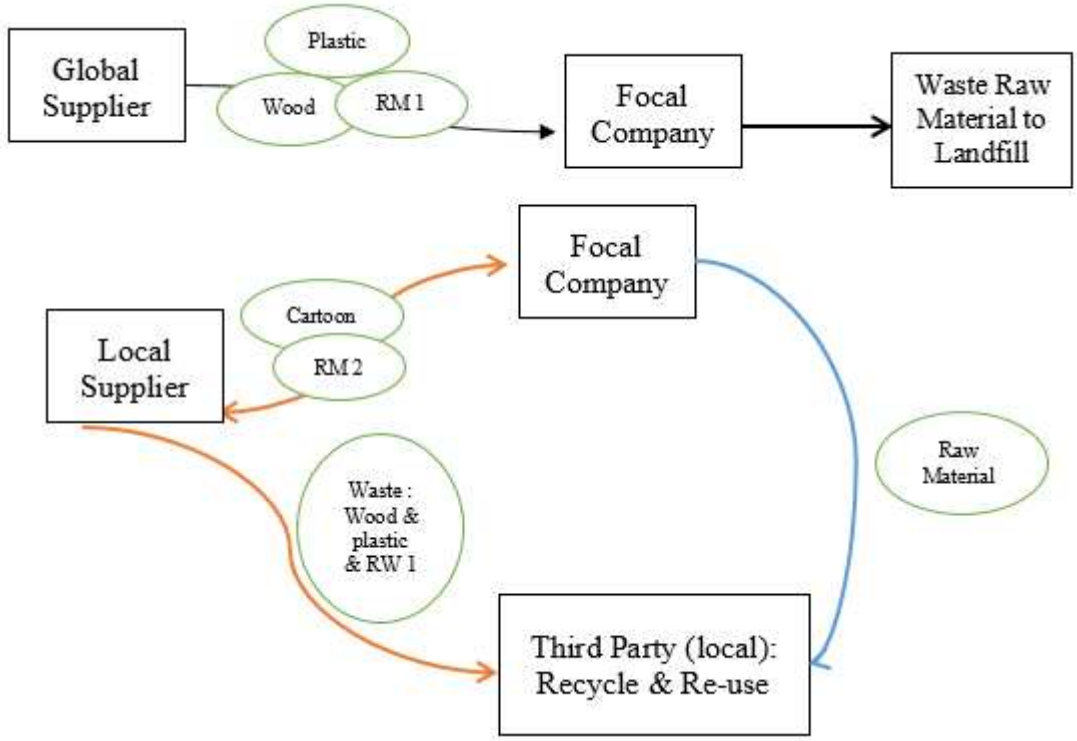
In the theme of distribution/Routing Planning i.e. the determination of the distribution routing, another interviewee said: IW5: "…We have to reduce the cost of our suppliers and ours as well by optimising the supply chain transportation and the distribution to our clients as well…In addition to that we bring the containers at their maximum capacity (full)"

Additionally, externalization of the transportation is another collaborative process the company was found to be doing. Instead of relying on "own transportation" externalisation reduced the carbon footprint and the links for buyers-suppliers as noted by interviewee IW1"…we bring our materials with people who are doing this job anyway, we do not do it but rather we do externalise the bringing of materials, for example we work with maritime, so the ships are going anyway, so the impact on the environment would be reduced".

In addition to these collaborative initiatives, the focal company was found to be collaborative with third parties and local suppliers too to achieve circular supply chain as highlighted by IW13 "…Instead of buying from Europe we buy from Country X a material with the same effect as the one suggested from the global procurement team…" Respondent further added "we bring our plastic from Country Y (in Europe) instead of a country in Asia to cut on links…"

In general, by collaborating with and training local parties, the company avoided long-haul routes thus reducing the carbon footprint. Figure 2.0 summarize the links (orange arrows) that helps in optimizing the distribution between focal company, third parties and suppliers.

Figure 2. Collaboration with third parties to reduce Supplier-Buyer Complexity



*FG: Finished Good

*RM: Raw Material

*Orange arrows: optimized links

The focal company was able to move towards a circular economy model because of the enablers risen from the Clean Technology strategies and opportunities such as due to the collaboration with SMEs. Moreover, based on the findings, it was found that the company can have a stronger circularity if it had multiple stakeholders involved in the strategy of CE which will be discussed further in the next sections.

As one of collaborations objective is the integration of human in achieving circularity, a participant stated how the focal company was ensuring to engage all its stakeholders in the aim to redesign its products by using human capital. Thus, by making sure all stakeholders are part of the BM of the company: IW5: "…Engaging all human capital we have is not for our suppliers only but all stakeholders, warehousing, the transportation partners, even the clients and the distributors were all supposed to be certified and adhere to "zero waste to landfill".

Focal company created a collaborative movement by using the human capital available within SMEs, to achieve greater results for circularity. This strategy benefitted SMEs from technology transfer, organizational learning.

This aspect of engaging multiple stakeholders ensures the Clean Technology objective in putting humans in the centre of rebuilding and redesigning the processes/products. By encouraging the Circular Economy mind set, thus helping one material to circulate more and extend its life cycle i.e. it helped in making the supply chain circular, as it increased the collection and redistribution efficiency which extended product longevity and hence material productivity (Ellen MacArthur Foundation 2015), An interviewee highlighted, IW5: "…We made a contract with recycling/re-using partners which indicates that the material we sent for them is not going to be thrown away, and we do regular audits to see if these partners are working with the materials sent or not".

Additionally, the focal company does not create the product from scratch, as it brings the plastic/cartoon from different suppliers. Therefore, it needs to involve its third-party partners to recycle the packages. This pressure on the recyclers/re-users helps in making the supply chain circular, by extracting maximum use of materials, as it increases the collection and redistribution efficiency which extend product longevity, thus, enhancing material productivity and efficiency (Ellen MacArthur Foundation 2015).

Additionally, SMEs benefited from CEBM information sharing, from the focal company, as highlighted by IW12: "…Our company uses capability building plan…Both machine and human capabilities…" This development of human-sphere helped in reducing waste from wood, IW10: "We trained an SME of 6 to 7 employees…Before this the wood was taking 75% of solid waste also, before this we were actually throwing our pallets to the landfill, but now we are able to save up to 300 pallets per day…"

On general, the practise of stakeholders' involvement helped in making supply chain more circular by extracting the maximum use of materials. However, it was not always possible or easy to train local parties, an interviewee said: IW 12: "…Training human capabilities take a lot of time from the three standards: quality, security and environment…How they work, do they believe in this etc."

In general, companies cannot achieve circularity by their own, especially when their products are being produced by different parties. Thus, collaborating and having circular mind-set for recycling and re-using the product at its 100% is important.

Based on the findings of the interviews, the focal company was not able to become fully circular because of some external factors such as the collaboration with the Government. For example, we found that the focal company had faced a refusal for one of its projects as its implementation would not save great amount of money to the country's economy. An interviewee IW10 stated: "our company had expectation of changing its production system into a sustainable green one by changing its energy supplying to thermal panels. Nevertheless, there was no legislation, therefore no investment from the Government, which means no funding because of the long payback period. This could replace 21% from the nonmanufacturing energy supplying… which means not much saving was going to be done for the economy of the Country"

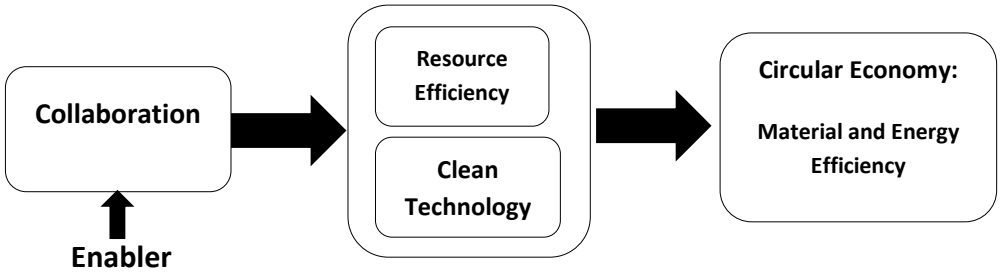
The reason may be because in this North African country, the price of electricity is very cheap; therefore, renewable energy may not save a lot of energy, which made these projects very expensive. The respondent further added IW10: "However, getting the funding is still possible when the pay back is less than 3 years, Focal Company is trying to get another project where it rents space of solar panels to generate its electricity, so it reduces the costs it pays for the electricity it is consuming. The payback for this project is still not 3 years, but it is challenged as it is around that period."

However, companies can still challenge Government to have the funding by stating the "eco-efficiency" part and not the saving part; nevertheless, the payback had to be less than three years. "For a project I convinced the Government from the point of eco-efficiency and not the saving part". In general, the focal company was moving toward circularity by applying small projects that fell under its BM of "reduce, reuse and recycle".

5. Discussion

Our findings build on previous studies that have sort to understand the collaborative capability on CE (Choi and Hwang, 2015; Govindan and Hasanagic, 2018). Findings highlight that small companies could benefit in technology transfer and organisational learning by collaborating with companies moving towards circular business models. This is an extension to Choi and Hwang (2015) on environmental and financial performance. Therefore, based on our research we proffer that local suppliers could be chosen and trained to ensure recycling and reuse of products and materials. Additionally, role of Government to facilitate an environment to ease the transition from linear to circular model was found to be evident. Based on the findings we propose a model for collaboration as an enabler for CE as shown in Figure 3 below.

Figure 3. Theoretical Framework: Collaboration as an Enabler for CE



The model emphasizes collaboration aspect within RE, CT that ensures the circularity of a company. This addresses gaps identified in literature (Govindan & Hasanagic, 2018). Moreover, it links NRBV using: RE and CT strategies with CE model, on its first initiative, by drawing on the enabler of the CE model. Previous researches used NRBV to discuss sustainable supply chain and collaboration (Miemczyk et al. 2016). Based on our findings collaboration can be used to drive the successful strategies under NRBV to create a competitive advantage in developing countries context, when using CE. Collaboration is found to progress toward CE objectives and is required for firms to achieve clever design for reuse and recycling.

The findings served to demonstrate collaboration as an enabler for CE in developing countries. We argue that the model (Figure 3) could be used to understand the focus for RE and CT. Thus, there are several ways the framework proposes under collaboration within RE and CT to encourage CE use:

- **Collaboration as shared understanding:** Shared understanding could facilitate sharing human and technical capabilities among companies to be material efficient (Vangen 2017). However, organizations are unable to fully realize their potential because they do not demonstrate

meaningful communication between them (Century et al. 2012). Based on the findings of the research, materials' saving needs collaboration and sharing of new product and process knowledge between the partners. We found that shared understanding could facilitate transition towards CE as it could help in inventing new processes required for CEBM.

- **Training suppliers:** Involvement of stakeholders is usually the focus of researchers, in talking about implementing CE (Greenwood 2007). However, our findings suggest that training suppliers could solve the complexities and challenges in the externalisation process while bringing/shipping material/finished goods, which helps in saving materials, thus resource efficiency. Developing new relationships between local suppliers and the companies creates value i.e. training them and certifying them to be the new suppliers instead of overseas partners reduce cost and save on material. Moreover, this type of collaboration with local companies could help in reverse logistics which is necessary for keeping materials longer in the cycle (Alt et al. 2015).

- **Involvement of stakeholders:** strengthening the human capability aspect within the whole supply chain (Genovese et al. 2017). Involvement of stakeholders is required for clean technology too, as without collaboration the move toward clean technology would not be efficient (Alt et al. 2015). For developing countries where people are working with limited resources, co-development and investment in technology could enhance capability of companies towards CEBM transition. It could help to create innovative solutions to save energy in the process of the production. Business should collaborate to develop new technologies to achieve resource efficiency (Wood and Gray 1991).

To achieve circularity in developing countries, a multiple-stakeholder approach is required as sole SMEs engagement will not suffice. Instead, governmental engagement and involvement is vital for attaining CE application to the wider economy. Our findings highlight that involvement of stakeholders encourages circularity within the whole SC as it allows the partners to reuse/recycle their materials by complying to "zero waste to landfill" thus, saving on the material and energy.

Collaboration could also help in creating cleaner technology that relies on energy efficiency and renewable energy and by getting rid of eco-efficiency losses within materials thus fulfilling one of the CE objectives. Additionally, collaboration enhances the CE principles as it requires the redesign of the supply chain. This latter cannot happen without the collaboration among suppliers and customers to create a system that facilitates reverse logistics (Mishra et al. 2018) required for repair and return materials.

To summarize, the themes mentioned in RE and CT strategies in the framework, help overcome the challenges faced by companies in developing countries. Thus, it ensures circularity as it helps in achieving CE objectives of material and energy saving and recycling (Ellen MacArthur Foundation 2015).

Findings highlighted the importance of collaboration on aspects of human-sphere in attempting to achieve circular business models. The focal company benefited from turning its challenges into opportunities, due to shared understanding and collaboration at various levels. Thus, we argue that in addition to technological sphere and biological sphere (Ellen MacArthur Foundation 2015), human-sphere is important to be addressed. Extant literature highlights importance of collaboration (Mishra et al 2018, Ellen MacArthur Foundation 2015), however, it does not specify how collaboration could be helpful especially in a developing country context. In this research we have delineated the importance of human-sphere in the form of collaboration among multiple stakeholders.

In general, this model can help researchers consider the Human-Sphere as the enabler for circular economy in developing countries. The model helps in understanding the factor of Human-Sphere in enabling Circular Economy by explaining the appliance of shared understanding, stakeholders' training and multiple stakeholders' engagement.

6. Conclusion

The focus of this research was to explore how developing countries could create value from the circular business model and the role of collaboration towards this transition. Findings highlight that one of the ways companies, in developing countries, could move to circular business models is by collaborating with multiple stakeholders. Collaboration acts as an enabler to make the supply chain more resource efficient and facilitates use of cleaner technology. For this, shared understanding among stakeholders and other entities in the supply chain is pertinent. Moreover, collaboration with new suppliers especially in geographically nearer locations could generate possibility of reducing, reuse and recycle thus moving towards CEBM. Role of Government was found to be critical too. For the growth of companies in a circular manner, Government must create an environment which would facilitate companies to easily transit from linear to circular model. This could be done by ensuring legislations to promote circularity by local businesses.

We propose a model for collaboration which could be used as an enabler for CE. The research has managerial implications. Companies who want to move towards the CEBM are facing uncertainties on how to involve other stakeholders. This research could be of interest to these companies.

Future research could validate the model in more developing countries' context to test whether the proposals put forward are applicable. Furthermore, the model could be tested in different sectors e.g. perishable goods to assess its applicability. In addition, NRBV could be used to explore different principles of CE as it has not been widely applied within this research area. Finally, a quantitative study could be conducted to allow for generalisability of the study.

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