

A JOURNEY TOWARD CIRCULAR ENTREPRENEURSHIP:  
EVIDENCE FROM A DEVELOPING COUNTRY

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A THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF  
PHILOSOPHY

ESSEX BUSINESS SCHOOL

UNIVERSITY OF ESSEX

OCTOBER 2024.

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## SUMMARY

The growing concern over climate change and global warming presents a significant threat to the planet. The United Nations (UN) has declared climate change to be the “defining issue of our time” and stated that we are at a “defining moment” (UN, 2024). In response to these challenges, entrepreneurs are increasingly adopting alternative and sustainable production and operational methods (De Angelis, 2020). One of the key sustainable strategies being utilised to address climate change is the adoption of circular economy (CE) principles. Entrepreneurs who explore and implement CE principles are referred to as circular entrepreneurs (Zucchella and Urban, 2019). However, the majority of the existing literature on entrepreneurship is grounded in the linear production model, meaning that relatively little is known about circular entrepreneurship. The nature and characteristics of traditional entrepreneurial models differ significantly from those of circular entrepreneurship. This research addresses this gap by presenting a comprehensive model that integrates entrepreneurial elements within the framework of the circular economy, thereby addressing key CE issues. Hence, the primary objective of this research is to develop a circular entrepreneurship model that will guide entrepreneurs in adopting sustainable production and operational practices. To achieve this aim, the researcher poses three key questions. Firstly, what are the antecedents, elements, and outcomes of circular entrepreneurship? Secondly, what paradoxes do circular entrepreneurs encounter when adopting CE principles, and how do they resolve these paradoxes? Lastly, how do dynamic capabilities assist circular entrepreneurs in transitioning from a linear economy to a circular economy? These three fundamental questions form the basis of three separate papers, presented in Chapters 2, 3, and 4.

Previous research on circular entrepreneurship was sporadic and addresses business model perspectives only (Cullen, and De Angelis, 2021; Brown et al., 2021; Fidan et al., 2021), and

significant lack of providing a comprehensive model. However, this study provides a model (Chapter-2) that guide entrepreneurs to move towards CE and gain competitive advantages.

The first paper's key finding is a circular entrepreneurship model that is structured across three levels: micro, meso, and macro. At the micro level, the model addresses a company's mission, vision, strategies, leadership, and risk-taking, all in alignment with CE principles. The meso level emphasises the importance of building partnerships and collaborations, while the macro level takes into account regional, national, and international factors. These levels collectively guide entrepreneurs in developing business models that achieve economic, social, and environmental sustainability. Although a gap between sustainable entrepreneurship and environmental entrepreneurship has been identified (Filser et al., 2019), this gap can be bridged by developing a research model that builds upon existing studies and integrates concepts from related disciplines.

The second paper (Chapter-3) identifies the various paradoxes encountered by circular entrepreneurs during their transition to a CE. Transitioning towards a CE has emerged as a critical priority for entrepreneurs, largely due to pressure from national, international buyers to adopt CE principles as a strategy to reduce carbon emissions and promote environmental restoration. There exists a gap in the literature linking CE with the concept of paradoxes, offering limited insights into the tensions and contradictions faced by entrepreneurs during this transition. Second paper provides strategies to overcome paradoxes and move towards a circular economy.

Third paper (Chapter-4) seeks to examine how circular entrepreneurs in emerging economies, such as Bangladesh, can attain competitive advantage through dynamic capabilities (DC) while addressing the tensions associated with CE practices. The paper addresses a gap in the literature by applying DC theory—centred on sensing, seizing, and transforming capabilities—to the

context of circular entrepreneurship. Although there is ongoing debate regarding the role of DC in achieving competitive advantage (Helfat et al., 2007; Teece, 2007), this research aims to provide empirical evidence on how circular entrepreneurs can navigate environmental challenges and secure a competitive edge through DC. The core question focuses and solve how these entrepreneurs can leverage DC to overcome CE-related tensions and gain competitive advantage (Helfat et al., 2007; Teece, 2007). The paper provides entrepreneurial strategies in sensing, seizing and transforming of DC.

*Key Words:* Circular entrepreneurship, paradoxes, dynamic capabilities, competitive advantages.

## ACKNOWLEDGEMENT

Firstly, I wish to express my profound gratitude to the Almighty for granting me the opportunity to pursue my PhD under the prestigious Commonwealth Scholarship. I am deeply indebted to Dr. Shamsul Karim, whose unwavering support and guidance have made it possible for me to embark on this long-held dream of pursuing Doctoral studies in Entrepreneurship. Without Dr. Karim's personal encouragement, it would have been impossible for me to commence my PhD journey at Essex Business School (EBS). His support extended far beyond academic matters, as he provided invaluable guidance in time management and played a pivotal role in shaping the direction of my thesis.

I would also like to extend my sincere thanks to Kwong Caleb for his continuous support throughout my PhD journey and for offering insightful comments that significantly enhanced the quality of my thesis. My appreciation also goes to Dr. Abraham Zhang, who supervised me during my first year at the University of Essex before his departure to another university. His contributions were instrumental in the early development of my research. I am equally grateful to Professor Niraj Kumar, as Department Chair, and Dr. Debashree De, as Panel Chair, for their encouragement and thoughtful feedback.

Moreover, I would like to acknowledge the Entrepreneurship and Strategy Group at Essex Business School, as well as my colleagues, for their support. I am also deeply appreciative of the administrative assistance provided by Alex Nicholas, Mrs. Emma Aldridge, Byfield Manning Natasha, Clare Summers, Liz Frazer, Deborah McColgan and others who were always available to support us throughout the PhD journey.

I wish to extend my deepest gratitude to Professor Ramakrishnan Ramanathan (Ram), Dr. Debashree, Professor Royce A Carroll, and Professor Muhammad S Akram, with whom I

collaborated on various research projects that significantly contributed to the development of my PhD writing and critical thinking skills.

I am also sincerely grateful to the University of Chittagong for their administrative support in granting study leave, and to the Department of Management for their unwavering assistance throughout my PhD journey. My heartfelt thanks go to the staff of the Department of Management, University of Chittagong, for their consistent and continuous administrative support.

I would like to acknowledge the insightful comments from the reviewers and participants at the 2023 British Academy of Management (BAM) Conference. Their feedback played a crucial role in refining my research ideas. Additionally, I am thankful to all my colleagues, peers, and friends in the research group and PhD office at Essex Business School for their camaraderie and support.

I am also deeply grateful to all the participants who generously offered their time for interviews and provided invaluable information that significantly contributed to my data collection process. Special thanks are due to Mr. Saifullah Mansur, Director of the Bangladesh Garment Manufacturer Association (BGMEA), for assisting data collections with industry leaders.

I am deeply indebted to my family—my father, mother, mother-in-law, father-in-law, my brothers and sisters, and all my relatives—for their love, affection, prayers, and blessings. The memory of my late brother, who passed away during the first year of my PhD journey, remains with me and is a source of strength that I will never forget. Lastly, I am profoundly thankful to my wife, son, and daughter, whose support was indispensable in allowing me to continue my studies at EBS. Their presence at the Southend Campus brought me great comfort and serenity during my research journey.

(Mohammad Shahab Uddin)

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## List of Acronyms

AI	Artificial Intelligence
BB	Bangladesh Bank
BBS	Bangladesh Bureau of Statistics
BSTI	Bangladesh Standards and Testing Institute
BGMEA	Bangladesh Garments Manufacturer and Exporter Associations
CE	Circular Economy
CEps	Circular Entrepreneurship
CEs	Circular Entrepreneurs
ETP	Effluent Treatment Plant
EU	European Union
GHG	Green House Gas
ISO	International Organisations for Standardisation
UN	United Nations
WB	World Bank
WTP	Water Treatment Plant

## Chapter One

### 1.0 An Introduction

Entrepreneurship theories have long been embedded within the economy, dating back to the works of Richard Cantillon (1755), Joseph Schumpeter (1934), McClelland (1965), Kirzner (1999), and Shane and Venkataraman (2000), all of which are grounded in the linear economic model. Environmental concerns, which gained prominence in the 1960s (Dietz and Rosa, 1994; World Commission on Environment and Development, WCED, 1987), introduced a new perspective, prompting a shift towards more sustainable modes of production and consumption. Hence, the rise of the circular economy (CE) and growing awareness of environmental challenges, such as climate change, have given rise to an entrepreneurial approach, termed "circular entrepreneurship" (Zucchella and Urban, 2019), which seeks to explore and exploit opportunities within the CE. While the concept of circular entrepreneurship is relatively recent, it is crucial to study circular opportunities and design organisations accordingly. To embrace the new realities of sustainability and circularity within the economy, it is essential to develop a robust model of circular entrepreneurship that can guide the field in addressing climate change issues. The present research offers such a model, grounded in current literature, and outlines strategies for navigating tensions and overcoming challenges by enhancing dynamic capabilities.

The pioneering work of Joseph Schumpeter in entrepreneurship research, particularly his seminal publication "The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle" (1934), has significantly influenced the field over the past several decades (Shane and Venkataraman, 2000). Subsequently, Israel Kirzner's "Competition and Entrepreneurship" (1973) has also been a major source of inspiration for

entrepreneurship research (Shane and Venkataraman, 2000; Shockley and Frank, 2011). According to Schumpeter (1934), entrepreneurship is characterized by acts of creativity and innovation, which involve generating new opportunities by integrating existing resources, and serves as a primary driver of a country's development. Entrepreneurship is also closely associated with the creation of new ventures and is viewed as an act of value creation (Schumpeter, 1934). The concept of entrepreneurship encompasses multiple dimensions, including its paradigms, scopes, and focal points (Murphy et al., 2006). For example, from an economic perspective, entrepreneurship is understood in terms of financial risk, pricing, demand and supply dynamics, and the generation of profit from these activities (Schumpeter, 1934; Hatt, 2018). Entrepreneurs are those who engage in the acquisition and distribution of resources at their own risk, working to bring the economy into equilibrium, and are characterized by their proactive and creative nature (McClelland, 1965; Schumpeter, 1934). Some scholars conceptualize entrepreneurship within the framework of corporate behaviour (Nielsen and Lassen, 2012), while others consider it a complex phenomenon, where within a corporate context, employees can be regarded as intrapreneurs or corporate entrepreneurs (Pinchot, 1987).

Although the field of entrepreneurship research encompasses a variety of perspectives (Kuratko and Audretsch, 2009), recent advancements in the CE have introduced a new dimension, necessitating an exploration of CE-related entrepreneurship. CE encompasses several established concepts, theories, and perspectives, including ecological efficiency, cleaner production, industrial ecology, zero emissions, and regenerative design (Deus et al., 2017). There is no universally accepted definition of CE among scholars (Brendzel-Skowera, 2021). However, the Ellen MacArthur Foundation provides a widely recognized definition, describing CE as “an industrial economy that is restorative or regenerative by intention and design” (MacArthur, 2013). This emerging area of study focuses on understanding the nature and

development of circular entrepreneurship in the context of adopting CE principles (reduce, reuse, recycle or R-strategies).

Adopting CE is important for resorting environmental issues and climate change (MacArthur and Heading, 2019). According to MacArthur and Heading (2019), reducing waste in the food industry alone could decrease annual Greenhouse Gas (GHG) emissions by 1.4 billion tonnes by 2050, which exceeds the pre-pandemic emissions of the entire airline industry. Efficiently recycling steel while preventing its contamination and maximizing its usage could eliminate the need for 500 million tonnes of new steel production by 2050, corresponding to over 1 billion tonnes of CO<sub>2</sub>e emissions annually (MacArthur and Heading, 2019). Transitioning to regenerative food production worldwide could lower emissions by 3.9 billion tonnes of CO<sub>2</sub>e per year by 2050 (MacArthur and Heading, 2019).

In this context, to save our environment and planet, it is essential to adopt CE principles, which requires a substantial number of circular entrepreneurs to facilitate the transition from a linear to a CE. Therefore, this research makes a significant contribution to both the entrepreneurship and CE literature. Till date, so far, our knowledge, no empirical research integrates these two concepts (i.e, CE and circular entrepreneurship) in the lens of Paradoxical theory and Dynamic Capability theory and provides a road map to achieve sustainability and competitive advantages.

Further, the current body of literature on circular entrepreneurship is nascent, with only a limited number of scholars addressing this concept (Zucchella and Urban, 2019; Zucchella et al., 2019; Cullen and De Angelis, 2021; Suchek and Fernandes, 2022; Re and Magnani, 2022; Dantas et al., 2022; Henry and Kirchherr, 2023; Del Vecchio and Passiante, 2021; Re and Magnani, 2023; Panait et al., 2022; Saura et al., 2022; Dragan et al., 2024; Mohapatra et al., 2024). Moreover, research on circular entrepreneurship is diverse, and there is a notable

absence of an integrated model in this field. To address this research gap, a systematic literature review has been conducted (first paper) to identify the antecedents and key elements of circular entrepreneurship. This review offers a comprehensive overview of the concept and presents an integrated model illustrating how the CE has influenced the development of circular entrepreneurship.

Entrepreneurs are increasingly adopting CE principles in their business start-up process (Suzanne, 2020). However, in developing countries, entrepreneurs face a dilemma regarding whether to adopt these principles (Al-Awlaqi and Aamer, 2022). This uncertainty generates both internal and external tensions and paradoxes that circular entrepreneurs must navigate. There is a notable lack of research examining the adoption of CE principles through a paradoxical lens. This research gap leads to a major research question: What are the major paradoxes that circular entrepreneurs face in adopting CE principles and how circular entrepreneurs overcome those tensions? Our second paper addresses and fill up this gap significantly by demonstrating and answering how circular entrepreneurs encounter various tensions and by outlining strategies to effectively manage and overcome these challenges.

Although circular entrepreneurs are gradually adopting CE principles, it remains unclear how they can achieve a competitive advantage and how they can navigate the transition to CE in the broader environmental context. This gap in the current literature prompts us to examine circular entrepreneurship through the lens of dynamic capability (DC).

This study demonstrates how circular entrepreneurs gain competitive advantages by sensing, seizing, and transforming various aspects of CE. Our third paper addresses these issues and presents a model illustrating how circular entrepreneurs achieve competitiveness. This work significantly contributes to the theories of dynamic capability and CE, representing a novel advancement in this field of research.

This chapter is organized as follows: First, the author provides a basic understanding of entrepreneurship and circular entrepreneurship. Subsequently, different aspects of the theory of paradox and DC theory are discussed. Following the theoretical explanations, the author outlines the main objectives of the research and presents the primary research questions. The research approach and framework are then explained. After this, the author describes the sample and data, followed by a discussion of the study's limitations.

## 1.1 Concept of Entrepreneurship and Circular Entrepreneurship

There is no generally accepted definition or model of what the entrepreneur is or does (Churchill and Lewis 1986; Cunningham and Lischeron 1991). The concept of entrepreneurship and its definition ranging from creativity, innovation to personal traits (Cunningham and Lischeron 1991). Early scholars for instance, Gartner (1985) defined “entrepreneur” as the founder of a business or new business, or a person “who started a new business where there was none before”. However, Schumpeter (1934) termed entrepreneurs are those who apply creativity and innovation in their activity. Scholar such as Peterson (1985) defined entrepreneurship as the identification and exploitation of opportunities. On the other hand, Garfield (1986) defined entrepreneurs as those “who develop a niche in the market or develop a strategy to satisfy some need.”

In contemporary times, market-related definitions of entrepreneurship have gained popularity due to the rapid changes in market dynamics driven by environmental issues. According to Gunter (2012), entrepreneurs are instrumental in creating, managing, and sometimes dismantling markets. Furthermore, Gunter (2012) asserts that entrepreneurs are pivotal drivers of economic activity and growth. Gunter (2012) define entrepreneurs as, “*Entrepreneurs are*

*individuals who, in an uncertain environment, recognize opportunities that most fail to see, and create ventures to profit by exploiting these opportunities.”*

### **Concept of Circular Entrepreneurship:**

CE offers numerous opportunities for entrepreneurs, which they must actively explore and utilize. However, the concept of circular entrepreneurship is under developing stages and researcher addresses it in detail the second chapter. Scholars such as Zucchella and Urban (2019) refer to those who successfully identify, explore, and capitalize on these opportunities as circular entrepreneurs. Circular entrepreneurship involves the processes of exploring and exploiting opportunities within the circular economy domain (Zucchella and Urban, 2019). Zucchella and Urban (2019, p. 195), describe circular entrepreneurship as “the processes of formation and exploitation of opportunities, using both commercial and ecological logics to address environmental challenges with the aim of closing, slowing, and narrowing the loop of resources and regenerating/reconstituting natural capital”.

This concept is emerging as a new reality aimed at restoring natural resources and addressing environmental issues through the social allocation of resources (Zucchella and Urban, 2019). Additionally, circular entrepreneurship encourages enterprises to transform circular movements and principles into a functioning circular economy (Zucchella and Urban, 2019). The characteristics of circular entrepreneurship are as follows (Zucchella and Urban, 2019): i) CE seems to be a component of a complex socioeconomic system. ii) It requires rethinking in terms of relationships, patterns (accumulated memories of events and structures), and context (technical, political, legal, cultural). iii) CE is inherently inclusive and collaborative by nature. iv) Circular entrepreneurship involves "creating responsible enterprises," encompassing not only legally registered businesses but extending beyond that.

According to Cullen and De Angelis (2021), circular entrepreneurship involves using CE strategies as the foundation for entrepreneurial ventures and initiatives. In contrast, Henry et al. (2023) characterizes circular entrepreneurship as a distinct and innovative form of entrepreneurship that operates within a circular business model (CBM). They define a CBM as encompassing circular activities at the micro-level, which aim to close material loops or enhance resource efficiency and longevity (Bocken et al., 2016).

Resource efficiency and longevity is relevant to sustainability and circular entrepreneurship is pertinent driver in public sector for sustainable development (Geissdoerfer et al.,2020; Henry et al., 2023). Circular entrepreneurs integrate principles and practices of circularity (such as reduction, regeneration, and reuse) into their business models, aiming for financial profit ( Henry et al., 2020; Reike et al., 2018). Unlike general sustainable entrepreneurs, circular entrepreneurs face the challenges of radical innovation in the sustainability sector (Henry et al., 2022). They intentionally embrace complex environments for their business models, which are inherently tied to the systemic and multi-societal nature of the circular economy (Henry et al., 2023; Schaltegger, 2016).

Value creation is essential during the transition from a linear economy to a circular one. Circular entrepreneurs play a key role in this process by designing innovative business models that incorporate social and environmental value (Mohapatra et al., 2024). Henry et al. (2023) identify that circular entrepreneurs are driven by personal motivations to generate social, economic, and environmental value, with non-economic social factors being the predominant motivators. Circular entrepreneurship encompasses both the entrepreneurial activities of opportunity exploration and exploitation (Shane and Venkataraman, 2000), and includes a range of organisational forms, from start-ups to established firms (Re and Magnani, 2023). Such firms may consist of innovative start-ups that adopt a circular business model from

inception, termed "born circular firms," or established businesses transitioning from a linear to a circular model, referred to as "growing circular firms" (Zucchella and Urban, 2019).

## 1.2 Research Questions

The body of literature on circular entrepreneurship is growing sporadically within the fields of business and social sciences. There is a pressing need to develop a clear model and conceptual framework for circular entrepreneurship. Despite the rapid increase in literature on circular entrepreneurship, the concept itself remains contentious among scholars. To address these misconceptions and provide direction for the field, it is essential to conduct a systematic literature review (SLR). Therefore, the primary objective of the first paper is to investigate the circular entrepreneurship process through an SLR, offering a comprehensive and conceptual model and clarifying its true meaning. While numerous papers exist on CE (Suchek et al., 2022), to the best of our knowledge, there is no SLR specifically focused on circular entrepreneurship. Hence, the basic question of our first paper is that what are the antecedence, elements and outcome of circular entrepreneurship? For answering this question, I developed a comprehensive model through SLR that provides antecedence, elements and outcomes of circular entrepreneurship. This model will add value and contribute in the theoretical development in the current literature of circular entrepreneurship and circular economy.

In today's increasingly dynamic and volatile world, circular entrepreneurs and organizations operate in a complex and evolving environment that generates paradoxical tension both internally and externally (Smith and Lewis, 2011). In this context, circular entrepreneurs and organizations must be creative and utilize natural resources effectively and efficiently (Dameron and Torset, 2014). Furthermore, organizations need to remain competitive in the global market by providing sustainable products and services that are acceptable to

international markets and stakeholders (Scherer et al., 2013; Marquis and Battilana, 2009). The introduction of CE principles and the demand for circular products exacerbate these challenges for circular entrepreneurs. Therefore, it is crucial for circular entrepreneurs to adopt CE principles while simultaneously addressing paradoxes and minimizing tensions to gain a competitive advantage. Given this context, the primary research question of the second paper is: What are the principal paradoxes and tensions that circular entrepreneurs encounter when adopting CE principles in their production and operations? In this paper, I have investigated major contradictions, tensions and paradoxes and provide the strategies to minimise those paradoxes.

Circular entrepreneurs apply circular principles—reduce, reuse, recycle—to decrease carbon emissions and combat climate change by redesigning existing business models (Cullen and Angelis, 2021). They aim to gain a competitive advantage and improve firm performance by leveraging dynamic capabilities (DC). DC are defined as “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece et al., 1997, p.516). The current literature connects entrepreneurship with sustainable development (Staicu, 2021; Zhu et al., 2019), sustainable entrepreneurship with education (Del Vecchio et al., 2021), and societal transformation with circular entrepreneurship (Ili, 2022). However, there is a lack of research linking circular entrepreneurship, minimizing CE tensions, and achieving competitive advantage through DC. Additionally, studies on how circular entrepreneurs can achieve a competitive advantage through DC within the context of CE are scarce. This research gap leads to the main research question of the third paper: How can circular entrepreneurs gain competitive advantages and minimize CE tensions by sensing, seizing, and transforming organizational resources within the realm of CE? In this paper, I have used DC theory and I have shown that how circular entrepreneurs gain competitive advantage

in the lens of DC. This will help current circular entrepreneurs to sense the market opportunities, seize those opportunities and transform their business into a circular business.

### 1.3 Current Status of Research in Circular Entrepreneurship and Bangladesh Context

The current literature on circular entrepreneurship is still in its early stages, with only a few authors exploring this concept (Zucchella and Urbann, 2019; Zucchella et al., 2019; Cullen and De Angelis, 2021; Suchek and Fernandes, 2022; Re and Magnani, 2022; Dantas et al., 2022; Henry and Kirchherr, 2023; Del Vecchio and Passiante, 2021; Re and Magnani, 2023; Panait et al., 2022; Saura et al., 2022; Dragan et al., 2024; Mohapatra et al., 2024). Among those scholars Zucchella and Urban (2019) are the pioneer in circular entrepreneurship research.

Zucchella and Urbann (2019) explored the process of circular entrepreneurship, which begins with understanding and implementing circular principles. They identified key triggers and backgrounds that drive value creation in this field, emphasizing its significant impact on preserving natural capital. Additionally, they highlighted essential value propositions and business models that support circular entrepreneurship, underscoring the concept and importance of these models. Zucchella and Urbann (2019) demonstrated practical applications by examining firms established with circular principles from inception, providing insights into their unique operations. They also investigated the transition of existing businesses towards the circular economy, focusing on large multinational companies as pioneers in adopting circular practices. Finally, they presented an integrative model for the growth of circular entrepreneurship, discussing the necessary internal and external conditions for sustainable growth. Their research has opened new avenues for circular entrepreneurship research and introduced fresh perspectives.

On the other hand, Cullen and De Angelis (2021) investigated the circular entrepreneurship in the business model perspectives. Their findings indicate that entrepreneurial value propositions, value creation and delivery, and value capture are fundamental to defining the circular business model. Entrepreneurial orientation is also characterized by embeddedness, meaning that creating value for the broader system an organization is part of is integral to being entrepreneurial in the circular economy (Cullen and De Angelis, 2021). Additionally, they argue that the pursuit of ecological and social value is central to the logic of value creation and is a defining feature of the entrepreneurial process (Cullen and De Angelis, 2021).

However, in their 2022 systematic review, Suchek and Fernandes identified four thematic groups related to CE-related entrepreneurship: growing circular SMEs, born circular firms and start-ups, social entrepreneurship within CE, and the support ecosystem for circular entrepreneurship. They observed that research has predominantly focused on the growth of circular SMEs, often at the expense of other groups, with a particular emphasis on studies conducted in European countries (Suchek and Fernandes, 2022). Based on these findings, they proposed a future research agenda and a conceptual model for the entrepreneurial process in CE, providing a foundation for further development and deepening of the literature on circular entrepreneurship (Suchek and Fernandes, 2022).

Value co-creation is an important dimension of circular entrepreneurship research. In the realm of circular entrepreneurship, Re and Magnani (2022) contribute to the literature by empirically analysing the dyadic co-creation processes through which SMEs generate value in collaboration with their key stakeholders. Circular enterprises typically engage in collaborative value co-creation with various stakeholders to narrow, slow, and close resource loops. Re and Magnani (2022) examine the mechanisms of dyadic value co-creation between circular firms

and each stakeholder. Their work advances the emerging field of circular entrepreneurship by proposing an empirical model for circular co-creation processes (Re and Magnani, 2022).

Dantas et al. (2022) empirically identified the antecedents and consequences of circular entrepreneurship in emerging markets, focusing on initiatives by circular entrepreneurs to serve low-income customers. They found that circular entrepreneurs can be driven by both intrinsic and extrinsic motivations. The study highlighted the societal, economic, and sustainability impacts of circular entrepreneurship, revealing that such enterprises can have both positive and negative environmental effects (Dantas et al., 2022).

Henry and Kirchherr (2023) discovered that grassroots circular entrepreneurs are predominantly driven by noneconomic motives, although they conceptually embrace a triple bottom line approach, incorporating economic, social, and environmental values. Despite their social altruism, these entrepreneurs often do not formalize socio-political aspects in their operations. Additionally, circular start-up founders exhibit an inventive mindset at the beginning of their entrepreneurial journey, which may be influenced by their limited focus on market orientation, as well as their restricted entrepreneurial experience and managerial education.

Mohapatra et al. (2024), through their case studies on value creation in small firms, conceptualize circular entrepreneurship as a process encompassing three primary stages: motivation, action, and value creation. The entrepreneur's motivation initiates various business actions geared towards circular value creation (Mohapatra et al., 2024). This process subsequently generates value at multiple levels, including the economy, business, and society (Mohapatra et al., 2024). Their findings, therefore, validate the concept of circular entrepreneurship and its significance in value creation within small businesses (Mohapatra et

al., 2024). However, research on circular entrepreneurship in Bangladesh remains at a nascent stage. Few entrepreneurs and top executives are familiar with the concept of CE, often conflating it with sustainability. Nevertheless, there is a broad consensus on the need to transition towards a circular economy or at least integrate its principles into business practices.

### 1.3.1 Bangladesh's Economy

Bangladesh, a South Asian country neighbouring India, gained its independence on 16 December 1971 from Pakistan. Since then, it has made significant economic and social advancements. Its GDP has increased approximately threefold in real terms, from USD 460 in 1971 to USD 1,700 in 2018, and the poverty rate has fallen from 71% in the 1970s to 20.5% in 2019. Additionally, the country has become the second-largest exporter of ready-made garments (RMG) (Raihan and Bourguignon, 2020). In 2015, Bangladesh attained lower-middle-income status and, by 2024, graduated from the United Nations' list of Least Developed Countries (LDC) (World Bank, 2024). Poverty, as measured by purchasing power parity (PPP), declined from 11.8% in 2010 to 5% in 2022, while moderate poverty decreased from 49.6% in 2010 to 30% in 2022 (World Bank, 2024).

The nation's progress can be attributed to a strong demographic dividend, with over 50% of its population being young, alongside the robust RMG sector, strong remittance inflows, and stable political and macroeconomic conditions over the past two decades (Raihan and Bourguignon, 2020; World Bank, 2024). Bangladesh has also benefitted from favourable access to international markets, stable relationships with international partners, and solid regional cooperation in South Asia (Raihan and Bourguignon, 2020). Currently, Bangladesh is the 33rd largest economy globally, having moved from its 50th position in the 1990s, and is projected to become the 28th largest economy by 2030 and the 20th by 2050 (Raihan and Bourguignon, 2020). In the 1990s, Bangladesh had an economy valued at approximately US

\$35 billion, which has expanded significantly to exceed US \$450 billion by 2022 and during this period, the country has maintained an average GDP growth rate of 5% (Ginting et al., 2025)

Since its independence in 1971, Bangladesh has been predominantly an agrarian economy, but it has progressively shifted towards manufacturing and, more recently, towards a service-based economy. Between 1991 and 2018, the contribution of agriculture to both GDP and employment has undergone significant structural transformation (Raihan and Bourguignon, 2020). For instance, there has been a notable movement of labour from agriculture to the services sector: in 1991, 69.5% of the workforce was employed in agriculture, whereas by 2018, this figure had declined to 40.1%. In contrast, the proportion of labour employed in the services sector rose from 16.9% in 1991 to 39.4% by 2018. During the same period, employment in the manufacturing sector increased modestly, from 12.4% in 1991 to 14.2% in 2018 (Raihan and Bourguignon, 2020).

It is notable that in 1971, agriculture accounted for over 60% of Bangladesh's GDP, but this figure has significantly decreased to 12.09% due to processes of structural transformation (Chowhan et al., 2024). This shift highlights the increasing movement of labour from agriculture to manufacturing, emphasising the importance of adopting circular economy principles within the manufacturing industries. Since the 1990s, Bangladesh has pursued trade liberalisation policies, resulting in an increase in its export-to-GDP ratio to over 5% and a rise in imports to approximately 20% by 2010 (Raihan and Bourguignon, 2020). While the export of jute products dominated in the 1970s, the ready-made garments (RMG) sector became the leading export industry by the 1980s (Raihan and Bourguignon, 2020). As of 2022, Bangladesh is estimated to have 5,876 RMG factories, generating \$46.99 billion in earnings (Rahman, M.M., 2023).

After the RMG sector, remittances are considered the second major driver of Bangladesh's economic growth. In terms of GDP, remittances increased from 1% around 1995 to 10% between 2008 and 2012 (Raihan and Bourguignon, 2020). The country's labour force is in high demand, particularly in Gulf countries, and foreign workers have made a significant contribution to the national economy.

Bangladesh has boosted private investment significantly from 6% of GDP in 1990s to 24% in 2023, however, foreign direct investment (FDI) inflow was comparatively low 0.95% of GDP between 2000 and 2022 whereas China has FDI 2.99% of GDP and India has 1.96% of GDP. In terms of infrastructure Bangladesh is in weak position. Dhaka (Capital city)-Chittagong (Port city) highway is the main gateway of economic transaction and Chittagong port handles 85% of country's foreign trade with poor and inefficient container handling, poor port management, labour problems and equipment shortage (NBR, 2022; Ginting et al., 2025).

### 1.3.2 Industrial Sectors of Bangladesh

Industries serve as essential components in the economic development of a nation. Since achieving independence, Bangladesh has demonstrated impressive progress in its industrial development, with the diversification of its industries steadily increasing. The principal industries in Bangladesh include textiles and garments (25%), engineering (18%), pharmaceuticals and chemicals (15%), fuel and power (10%), food and allied products (9%), information technology (4%), jute (2%), and paper and printing (1%), with miscellaneous industries comprising 6% (Sarkar et al., 2017). According to the Bangladesh Bureau of Statistics (2022), the contribution of agriculture in the GDP in fiscal year 2020-21 12.07%, industrial sector was 36.0% and service sector was 51.92%

Several of these key industries are discussed below:

### 1.3.2.1 Garment Industries

Bangladesh is the second-largest exporter of garments globally where 4.2 million people are working and 80% of workers are women. The ready-made garments (RMG) industry began its journey in the 1980s and has since experienced exponential growth (Sarkar et al., 2017). However, the tragic collapse of Rana Plaza in 2013, which resulted in over a thousand fatalities and many injuries, shook the global community. This incident led to a temporary slowdown in the growth of the RMG sector, as numerous national and international regulations and compliance requirements were imposed. Nevertheless, these regulations raised awareness among entrepreneurs, prompting them to adopt various compliance measures, ultimately providing the RMG sector with a competitive advantage.

Currently, there are over 5,000 RMG units, including around 200 green factories that comply with both ACCORD (for fire and building safety compliance) and ALLIANCE (for worker safety). According to a report by Bangladesh Bank (BB, 2022), total export earnings from the RMG sector amounted to USD 11,184.76 million in the second quarter of the fiscal year 2022, representing a 40.36% increase compared to the same quarter of the previous year (BB, 2022). The major export destinations for RMG products include the USA, Germany, the UK, Spain, France, Italy, the Netherlands, Canada, and Belgium, with 73.45% of total RMG exports directed to these countries. The net export during this period stood at USD 6,045.59 million, or 54.05% of the gross RMG export (BB, 2022).

### 1.3.2.2 Chemical Industry

Chemicals play a vital role in the production processes of various industries. However, Bangladesh is not well-developed in the chemical sector, with a significant proportion of chemicals being imported from abroad, primarily from China, the USA, and Singapore

(Salahuddin, 2011; Sarkar et al., 2017). The main chemical products manufactured domestically include those from Chlor-Alkali plants such as hydrogen peroxide, caustic soda, chlorine, hydrochloric acid, sodium hypochlorite, and bleaching powder (Salahuddin, 2011; Sarkar et al., 2017). The country's production capacity ranges from a maximum of 800 metric tonnes per day for hydrochloric acid to a minimum of 42 metric tonnes per day for liquid chlorine (Sarkar et al., 2017). According to Export Promotion Bureau (2024), the export of chemical product increased by 12.83% in the quarter May-July in the fiscal year 2023-24 than the previous year in the same period.

There are only a limited number of companies involved in the production of basic chemicals in Bangladesh, with notable firms including HP Chemicals, ASM Chemical Industries Ltd., Samuda Chemical Complex Ltd., Global Heavy Chemicals Ltd., and Tasnim Chemical Complex (Salahuddin, 2011). In industrial production, chemical processes generate by-products, which are utilised in other manufacturing processes, thus promoting industrial symbiosis. For instance, the production of caustic soda yields hydrogen (H<sub>2</sub>) and chlorine (Cl<sub>2</sub>) as by-products, both of which have various applications in the production of other materials (Salahuddin, 2011). One particularly valuable by-product is hydrochloric acid, which is employed across several industries, including the metal industry, effluent treatment plants, pharmaceuticals, and leather manufacturing (Salahuddin, 2011).

However, these chemicals are also creating environmental pollution and many companies do not have proper chemical management while using chemicals in industrial process. For example, Rasul et al. (2006) identified that the major polluting industries are food industry, pulp and paper industry, tanneries and leather industry that use toxic and dangerous chemicals. The researcher had the opportunity to conduct interviews with representatives from these industries.

### 1.3.3 Pharmaceutical Industry

The pharmaceutical sector is one of Bangladesh's most promising and rapidly growing industries. Currently, there are approximately 300 pharmaceutical companies operating in the country, producing around 5,600 different branded medicines (Sarkar et al., 2017). In recent years, these companies have begun exporting pharmaceutical products to 79 countries, including several in Europe (Sarkar et al., 2017). The industry primarily manufactures tablets, capsules, syrups, inhalers, suppositories, and nasal sprays (Islam et al., 2018; Sarkar et al., 2017). Despite its growth, however, pharmaceutical exports remain relatively small. In the fiscal year 2011-12, exports amounted to just USD 48.3 million (Sarkar et al., 2017).

Recent research indicates that approximately 97% of the demand for medicines in Bangladesh is met through local production, with the pharmaceutical sector experiencing significant growth (Islam et al., 2018). It is estimated that revenues from this sector reached USD 2.4 billion in 2016, rising to USD 2.6 billion in 2017, reflecting its promising growth and potential within the country (Islam et al., 2018). According to research, this industry is the third-largest contributor to national revenue (Arafat et al., 2015; Manik, 2023). Additionally, studies highlight its substantial contribution to revenue generation, with the industry earning USD 188.78 million during the 2021-22 fiscal year, representing a growth rate of 11.7% (Export Promotion Bureau, 2022; Manik, 2023). Furthermore, the Export Promotion Bureau (2024) reported a 14.32% increase in pharmaceutical exports during the May-July quarter of the 2023-24 fiscal year compared to the same period in the previous year.

A significant challenge facing the pharmaceutical industry is that 90% of the raw materials required for medicine production are imported from foreign countries (Islam et al., 2018). Furthermore, Sultana (2016) identified several additional issues confronting the sector, including restrictions on international drug trade, shortages of raw materials, inadequate drug

testing facilities, insufficient bioequivalence testing capabilities, intense rivalry and unhealthy competition among existing firms, as well as barriers to export.

#### 1.3.2.4 Leather Industry

Leather industry is one of the oldest industries in Bangladesh. Bangladesh has huge prospect in leather production because it can provide abundant raw materials to produce leather related products. The yearly production capacity of raw materials is estimated about 750 million sq. ft. (Sarkar et al., 2017). Recently there are about 113 tanneries that produce about 300 million sq. ft of leather and about 75% those leather exported to different countries earning about USD1.1 billion and that around only 0.5% global market (Sarkar et al., 2017). There are about 3,500 companies that produces leather related products in the country (Sarkar et al., 2017). According to Export Promotion Bureau (2024), the export of leather increased by 9.71% however, the leather products decreased by 0.81% in the quarter May-July in the fiscal year 2023-24 than the previous year in the same period.

#### 1.3.2.5 Cement Industry

Cement industry is one of the major industries of Bangladesh. It is estimated that the total capacity of the factories operating in Bangladesh is 3 million MT in 2014 (Sarkar et al., 2017). Bangladesh is exporting cements in West Bengal of India and Myanmar (Sarkar et al., 2017). Bangladesh export promotion bureau data reveals that in fiscal year 2012, there are 21% increase of export in this industry (Sarkar et al., 2017). Bangladesh is increasing its export to other countries such as Sri Lank, and other African countries (Sarkar et al., 2017). According to Export Promotion Bureau (2024), the export of cement products increased by 34.27% in the quarter May-July in the fiscal year 2023-24 than the previous year in the same period.

### 1.3.2.6 Food Industry

One of the potential industries is food processing industry of Bangladesh. It is estimated that it contributed to 2% of total GDP and accounts for 20% of all manufacturing productions (Sarkar et al., 2017). This industry produces frozen food, tea, vegetables, cereals, bakery items, dairy, beverages, and other various foods. According to Export Promotion Bureau (2024), the export of agriculture products including dry food, vegetables and others increased by 8.2% in the quarter May-July in the fiscal year 2023-24 than the previous year in the same period.

### 1.3.2.7 Fertiliser Industry

Bangladesh is predominantly agricultural country and fertiliser is the most essential for agricultural productions. It contributed about 16% of total GDP and employs about 40% of total labour forces (Sarkar et al., 2017). However, the annual production of fertiliser is less than the annual demand of the fertiliser and about 68% of the fertiliser imported from abroad to meet the demand (Sarkar et al., 2017).

There are many other industries in Bangladesh that gradually adopting CE principles some of them are ship breaking industries, electronic manufacturing industries, oil industries, cottage industries, automobile industries, steel industries, petroleum industries, and jute industries are major.

### 1.3.2.8 CE Practices in Different Industries in Bangladesh

Bangladesh holds the distinction of being the world's most polluted country in terms of fine particle air pollution (PM 2.5), with levels reaching six times the limit recommended by the World Health Organization (WHO, 2024). In 2018, air pollution was identified as the leading risk factor for the 572,600 deaths in Bangladesh caused by non-communicable diseases (Koop,

2021). According to Air Quality Life Index (AQLI), Bangladesh has ranked one in the world with 73.96 particulate pollution ( $\mu\text{g}/\text{m}^3$ ) (AQLI, 2024). Circular entrepreneurship can reduce this air pollution by applying circular principles (reduce, recycle, reuse, remanufacturing), as these principle restore our environment.

In the paper industry, the Karnaphuli Paper Mill (KPM) is the largest state-owned integrated pulp and paper factory in Bangladesh (Ahmed et al., 2022). This mill utilises 10% or less recycled fibre in its production, whereas, on a global scale, recycled fibre constitutes 45% of the raw materials used in the paper industry (Ahmed et al., 2022). Conversely, private paper factories in Bangladesh predominantly use recycled fibre combined with virgin fibre (Quader, 2011). The Karnaphuli Paper Mill is reported to cause significant pollution in the Karnaphuli River due to its lack of an effluent treatment plant since 1953 (Dhaka Tribune, 2016). The report from Dhaka Tribune (2016) also mentioned the river has lost 20-25 freshwater species and 10 brackish water species from its 140 fish species.

In the case of the garments industry, Bangladesh derives 80% of its export revenue from this sector (Saha, 2022; Bangladesh Garment Manufacturers and Exporters Association, 2020). However, approximately 4,500 apparel factories in Bangladesh generate 0.40 million tonnes of textile waste annually, with toxic dyeing materials being particularly hazardous (Saha, 2022). Textile dyes, which are used to colour fabrics, can be produced from natural or synthetic materials (Yaseen and Scholz, 2019). Synthetic dyes, in particular, are the second-largest polluter of water after plastics (Lellis et al., 2019). These textile dye effluents are often discharged into nearby water bodies, disrupting oxygen levels and the photosynthesis process (Tedesco and Montacchini, 2020).

Despite numerous administrative challenges, Bangladesh has made notable progress in the export-oriented Ready-Made Garments (RMG) sector, positioning itself as a promising country in the South Asian region (Hasan et al., 2016, 2018; Islam et al., 2023). The RMG sector contributes over 10% to Bangladesh's GDP, and 85.4% of the country's foreign exchange earnings in the fiscal year 2018–2019 were from this sector (Hasan et al., 2016; Islam, 2020). However, the sector still struggles with poor compliance and immature sustainability practices. Major issues include a shortage of skilled labour, an uneven man-machine ratio, the absence of formal employment contracts, unhealthy working environments, long working hours, and gender-based discrimination (Draganić and Arefin, 2021; Islam and Jabber, 2018).

The leather sector is regarded as one of the most polluting industries globally (Bai et al., 2021). This is due to the extensive use of chemicals in the treatment of raw hides and skins, which significantly contaminates the air, water, and soil (Bai et al., 2021). The leather industry is another crucial industrial sector in Bangladesh (Bai et al., 2021). According to data from the Export Promotion Bureau (EPB), the leather industry in Bangladesh generated USD 98.31 million in FY2019-20, which represents a decline compared to the previous fiscal year 2018-2019 (Export Promotion Bureau Report, 2020). However, the recent data shows that export of leather is experiencing a resurgence, with Bangladesh generating \$100.40 million from the sale of semi-processed raw materials between July and March of the 2023-24 fiscal year (EPB, 2024).

The substantial waste production and material consumption in Bangladesh's leather sector result in considerable environmental and social impacts. These impacts can be significantly mitigated through the adoption of CE principles (Moktadir et al., 2020). Moktadir et al. (2020) also contend that the leather sector is considered a major polluting industry in emerging economies like Bangladesh.

As a developing country, Bangladesh faces significant barriers and challenges in implementing CE principles. These include a lack of cohesion and integration among stakeholders, the absence of advanced technology, improper waste and material management, and consumer indifference (Jahan, 2017; Saha et al., 2021; Islam et al., 2023).

In Bangladesh, recycling is the most prevalent aspect of the CE concept (Ahmed et al., 2019). Recently, the practice of reuse has gained popularity among the general population, facilitated by re-commerce activities on Facebook, which have helped diminish the stigma associated with using second-hand goods (Arman and Mark-Herbert, 2021). Additionally, many companies and producers are actively engaged in conserving resources and reducing waste (Ahmed et al., 2022). However, there appears to be a lack of research on circular entrepreneurship within the Bangladeshi context. Addressing this gap would make a significant contribution to the literature on entrepreneurship and circular entrepreneurship in Bangladesh.

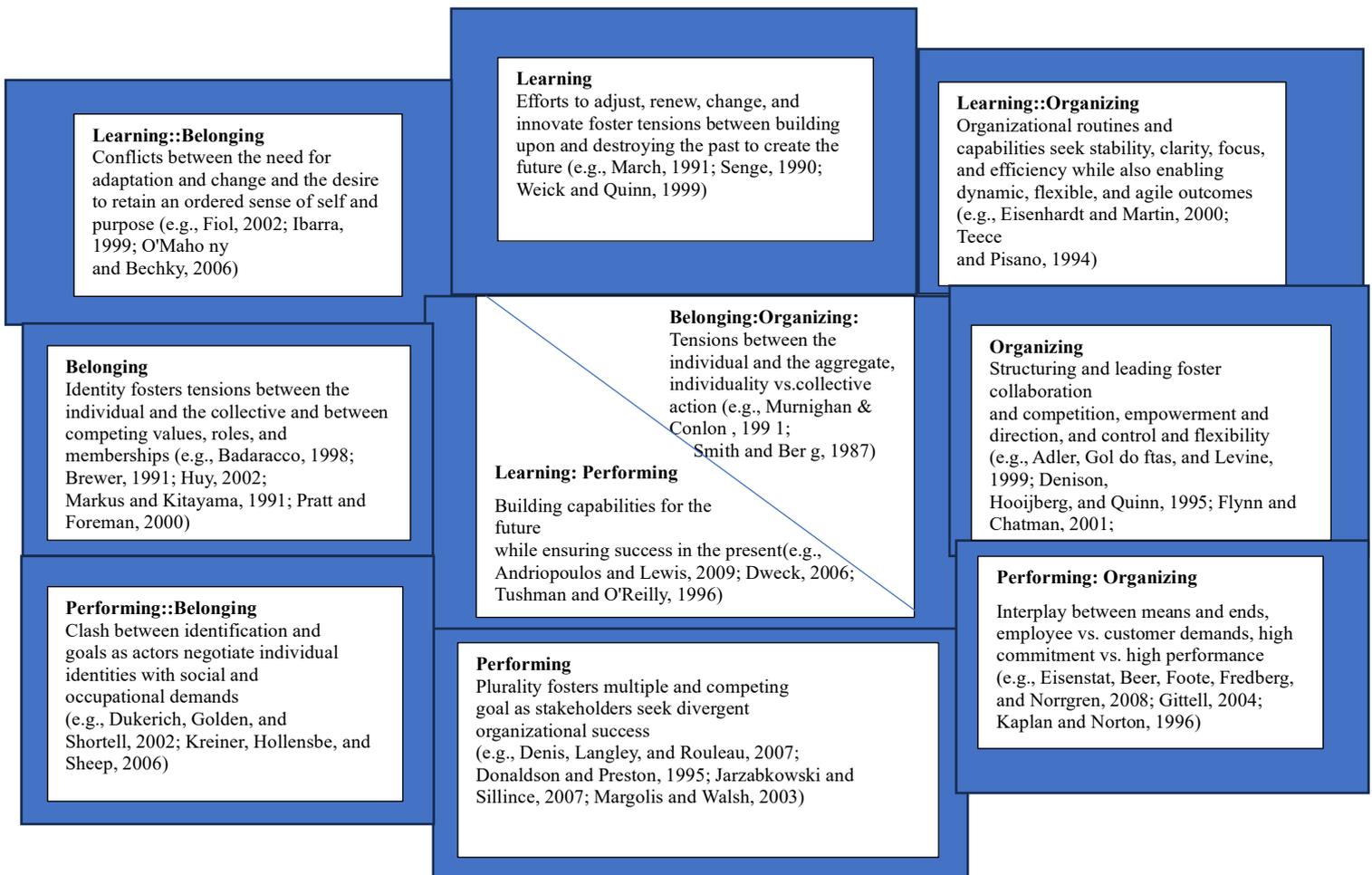
## 1.7 Theories Used in this Research

### 1.7.1 Theory of Paradox

Smith and Lewis (2011) identified various tensions within organisations that must be addressed and resolved concurrently. For example, organisations encounter contradictions between profit and social responsibility (Margolis and Walsh, 2003), exploration and exploitation (Smith and Tushman, 2005), efficiency and flexibility (Adler and Levine, 1999), collective and individual interests (Murnighan and Conlon, 1991), as well as control and collaboration (Sundaramurthy and Lewis, 2003). Based on these tensions, Smith and Lewis (2011) defined paradoxes as "contradictory yet interrelated elements that exist simultaneously and persist over time."

Drawing on these tensions and other literature, Smith and Lewis (2011) classify paradoxes into four categories: learning, belonging, organising, and performing. These paradoxes reflect the fundamental activities of organisations, wherein learning denotes knowledge, belonging signifies interpersonal relationships, organising encompasses processes, and performing relates to goals (Smith and Lewis, 2011). According to Smith and Lewis (2011), learning paradoxes arise during innovation and change processes, as these phases replace existing structures with new phenomena, necessitating a trade-off between exploration and exploitation. Organising paradoxes, on the other hand, emerge from organisational processes aimed at achieving specific goals (Smith and Lewis, 2011). Belonging paradoxes stem from conflicting forces or identities (individual or collective) and contrasting values, while performing paradoxes originate from competing demands and roles, such as internal versus external requirements (Smith and Lewis, 2011).

Organisations seek to achieve conflicting goals with win-win strategies (Daddi, et al., 2011). From an organisational strategic perspective, paradoxical goals are interconnected, meaning they are 'mutually constitutive, yet contradictory' (Iivonen, 2018, p. 310). This implies that strategic paradoxes arise from conflicting goals, although not all conflicting goals culminate in a strategic paradox (Schad et al., 2016).



**FIGURE 1: Categorization of Organizational Tensions (Smith and Lewis, 2011).**

The figure above holds significant relevance for the study of circular entrepreneurship and the context of the circular economy (CE). For instance, during the learning phase, organisations undergo transformations in their current practices, innovate new technologies, and shape a

future that breaks with the past. To effectively adopt CE, circular entrepreneurs must engage in a learning process, establishing their organisations with new knowledge while addressing and minimising existing tensions.

In the organising phase, as organisations seek to build a sustainable future, it is crucial to facilitate both collaboration and competition among departments by providing them with flexibility and clear guidance. For example, without adequate logistical support and a flexible organisational structure, it becomes challenging to dismantle entrenched norms and fully embrace circular principles. While directives for CE compliance typically originate from senior management, it is equally important to ensure that lower management levels are empowered to act accordingly. A disconnect between strategic direction and operational execution would hinder progress towards CE.

In the performing phase, circular entrepreneurs must balance multiple and sometimes conflicting goals, striving to reduce these conflicts and address any gaps between the organisation's strategic intent and actual performance. In the belonging phase, circular entrepreneurs identify and navigate tensions between individuals and groups. Here, they must work to minimise intergroup tensions and reduce role conflicts within teams by clarifying the transition to CE and motivating members to recognise the importance of CE adoption.

At this juncture, one may question the relevance of discussing the paradox theory in relation to sustainability and CE. The issue of sustainability paradoxes has garnered considerable attention within the field of the circular economy. However, there is a notable paucity of empirical studies conducted within emerging economies that examine the diffusion of the circular economy and sustainability through the lens of Paradox Theory (Chiappetta Jabbour et al., 2020). Recently, Paradox Theory has gained traction in the sustainability and circularity

literature (Han et al., 2018; Ivory and Brooks, 2018; De Angelis, 2021). This theory has also been incorporated into contemporary business model research and CE research (Daddi et al., 2019; De Angelis, 2021). The circular economy necessitates systems thinking, and Paradox Theory integrates complexity thinking with systems thinking (De Angelis, 2021; EMF et al., 2015).

The CE introduces a revolutionary approach, challenging the prevailing linear economic model by attempting to decouple economic growth from the depletion of natural resources. This transition may induce tensions and encounter resistance from the established linear paradigm (De Angelis, 2021; Hopkinson et al., 2018; Lacy et al., 2019). Paradoxes are often interrelated and contradictory, as they can evolve into conflicting goals from a strategic perspective (Schad et al., 2016; Dieste et al., 2022).

In CE perspective, firstly, companies aim to meet circular economy goals, such as incorporating recycled raw materials, thus showcasing their dedication to environmental sustainability. Conversely, this approach may undermine the quality and, in turn, the competitiveness of their products. These sorts of paradoxes are common in CE domain and circular entrepreneurs need to be strategic to have a win-win situation.

Another important question may arise, why is adopting a paradoxical perspective crucial for comprehending corporate sustainability? This approach is essential as it elucidates the nature of the corporate sustainability debate both within and outside organisations (Daddi et al., 2019). It also reveals how managers navigate tensions while addressing conflicting and competing demands (Van der Byl and Slawinski, 2015; Daddi et al., 2019). Moreover, few empirical studies have been published in this field (Daddi et al., 2019), with Van der Byl and Slawinski

(2015) noting that "paradox articles tend to be conceptual, thus opening up opportunities for empirical work in this area" (Van der Byl and Slawinski, 2015, p. 55; Daddi et al., 2019).

Daddi et al. (2019) connects corporate sustainability and circularity with paradoxical tensions. In terms of corporate sustainability, they identified conflicting tensions among the economic, social, and environmental pillars of sustainability, where the enhancement of one pillar may detrimentally impact another. Conversely, regarding circularity, they argue that industrial symbiosis can enhance resource efficiency (Daddi et al., 2019). However, this industrial symbiosis, which involves using waste or by-product in the production process, may negatively affect product quality or compromise the value of the final products (Dagilienė, and Varaniūtė, 2023). This situation can create tension between the use of recycled raw materials and environmental sustainability (Dagilienė, and Varaniūtė, 2023). To mitigate this issue, an efficient production process needs to be established to improve resource efficiency and achieve environmental goals simultaneously, thus providing a win-win situation (Van der Byl and Slawinski, 2015, p. 55; Daddi et al., 2019).

In this context, the present study seeks to examine how Bangladeshi circular entrepreneurs mitigate these tensions and attain sustainability in their production and operations. This research is the first of its kind within the context of Bangladesh, an emerging country in South Asia.

### 1.7.2 Theory of Dynamic Capability (DC)

Kapoor and Aggarwal (2020) posit that the DC theory is rooted in Schumpeter's concept of creative destruction. Schumpeter's perspective on innovation highlighted how it supplants existing competitive forces within the market, acknowledging the dynamic and non-static

aspects of economic life. This perspective on economic phenomena, characterized by continuous development and innovation, was termed dynamic (Aghion et al., 2001; Kapoor and Aggarwal, 2020).

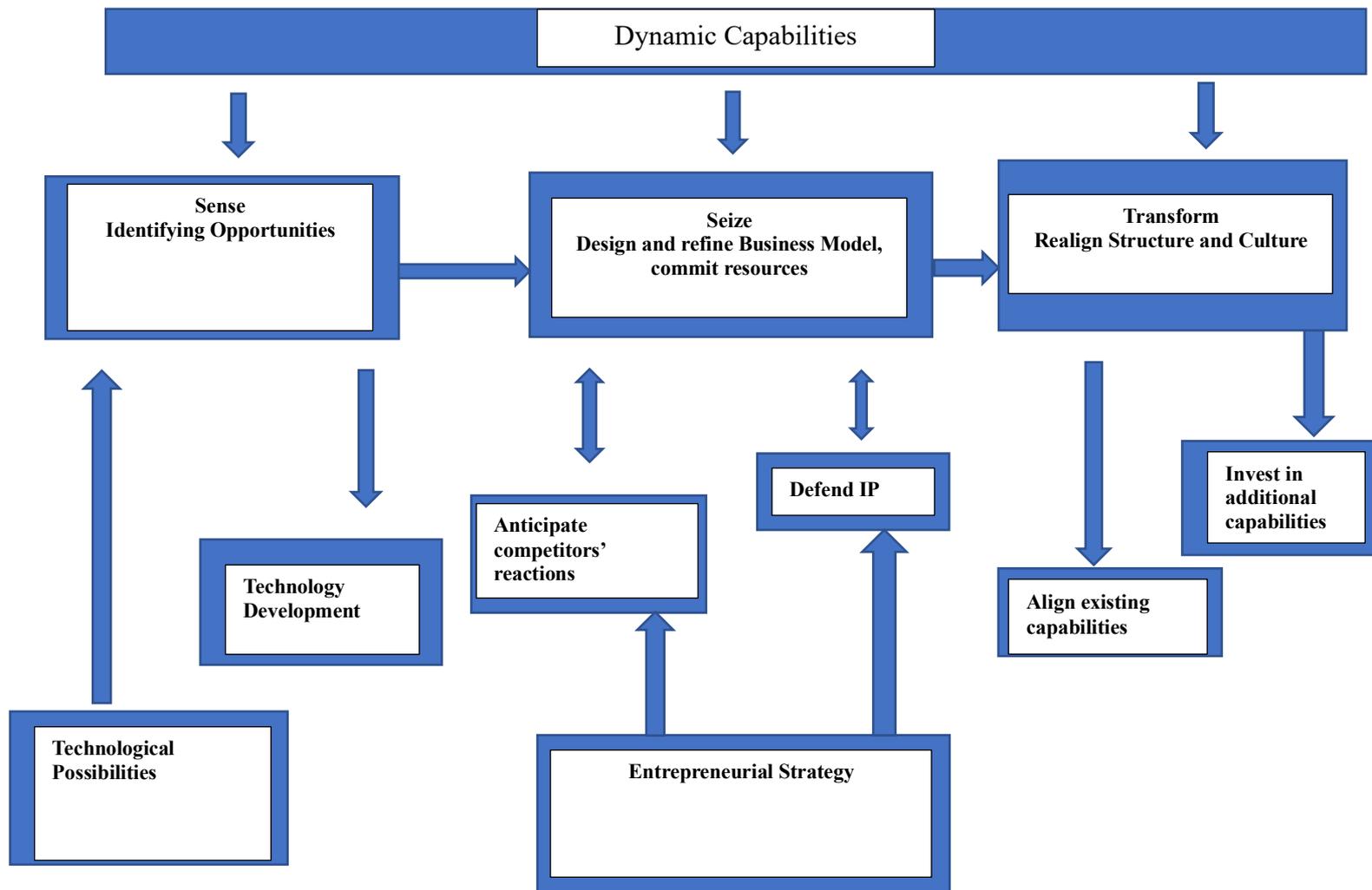
The notion of "dynamic capabilities," initially proposed by Teece and Pisano (1994) and subsequently elaborated by Teece et al. (1997) and Eisenhardt and Martin (2000), has sparked extensive discussion and debate (Pisano, 2017). According to Teece et al. (1997, p. 516), dynamic capabilities refer to "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments."

Further, dynamic capabilities are typically defined in a broad sense as the ability of firms to reconfigure and enhance their competencies (Pisano, 2017). These capabilities are fundamentally connected to organisational adaptability (Pisano, 2017). Teece (2007, p.1319) further elaborates that dynamic capabilities can be broken down into the capacities such as sensing; Seizing and transforming.

During the sensing phase, circular entrepreneurs identify potential opportunities through environmental scanning, with technological possibilities and advancements offering critical insights for recognising and seizing these opportunities. In the seizing phase, entrepreneurs design business models that are aligned with the shifting environment and allocate resources to maximise the potential of these opportunities. While developing new business models, they must also account for competitors' responses and intellectual property (IP) concerns, where entrepreneurial strategy plays a crucial role, leading towards the transformation phase. Following successful seizing, entrepreneurs restructure their organisations to maintain competitiveness by enhancing, integrating, protecting, and, when necessary, reconfiguring both tangible and intangible assets. At this stage, they assess whether further investment is required

to build the necessary capabilities. After completing this transformation, entrepreneurs are positioned to secure competitive advantage.

### The DC Model:



**Figure:** The Dynamic Capabilities Theory (Adopted from Teece et al., 1997)

Some academics contend that companies must cultivate novel (and dynamic) capabilities to implement a circular economy (Khan et al., 2020). However, there is limited discourse on the mechanisms by which firms can develop these capabilities (Khan et al., 2020). Significantly, there is a scarcity of research concerning the specific skills, processes, and organisational activities (micro-foundations of dynamic capabilities) that could support the implementation of a circular economy.

The DC framework offers a lens through which to understand organisational operations (Teece, 1997) and the business model (Zott, 2010). A higher-order capability allows a company to integrate, expand, and reconfigure internal and external resources in response to rapidly changing business environments (Teece, 1997; Awan and Sroufe, 2022). Teece (2007) was one of the pioneers in proposing the theoretical perspective of DC on business model design. The creation of a new, adaptive business model has long been considered a micro-foundation of dynamic capabilities (Awan and Sroufe, 2022; Khan et al., 2020).

Why is dynamic capability theory relevant to the CE study? It is pertinent because the CE represents a rapidly evolving environment (Bag, Gupta, and Foropon, 2019). Furthermore, this theory has been applied in strategic management research (Eisenhardt and Martin, 2000; Winter, 2003; Zahra, Sapienza, and Davidsson, 2006) as well as in corporate sustainability studies (Kabongo and Boiral, 2017; Wu et al., 2013). Some scholars (Daddi, Todaro, De Giacomo, and Frey, 2018; Khan et al., 2020) observed that this theory is minimally explored within the context of environmental management studies. Additionally, Wu, He, Duan, and O'Regan (2012) highlighted that “how firms develop and apply dynamic capabilities to address the distinctive challenges involved in corporate change toward sustainability is yet to be fully

explored” (p. 231-233). Therefore, more research on dynamic capabilities for corporate sustainability is generally required (Amui, Jabbour, de Sousa Jabbour, and Kannan, 2017).

Why is DC important? While empirical research found that some industries were performing more profitable than others, but the theoretical research failed to explained it properly (Pisano, 2017). To fill this gap, Porter’s (1980) “five forces” model for competitive strategy has been successful by explaining competitive advantages (Pisano, 2017). However, Porter’s framework didn’t explain intra-industry variability in profitability over long period of time (Lippman and Rumelt, 1982; Rumelt, 1984; Rumelt, 1991; Pisano, 2017). There are many companies within same industry following similar strategies had different performance outcome. To fill this gap, scholars brought resource-based theories (Teece, 1982; Wernerfelt, 1984; Barney, 1991; Amit and Schoemaker, 1993) where they explained firm specific resources that firms can use for strategic move (Pisano, 2017). However, evidence from case studies confirmed that operational performance and product development (Abernathy et al., 1983; Hayes and Clark, 1986; Garvin, 1988; Clark and Fujimoto, 1990; Pisano, 1996; Iansiti, 1998) indicate that some organisations perform better by creating and developing some capabilities related to product development and sustain competitive advantage (Pisano, 2017). Criticism of resource-based view is that resource is not static and some firms can create or renew capabilities by improving their skills and building competencies and hence gain competitive advantage (Pisano, 2017).

Therefore, the resource-based view offers limited guidance to firms regarding the types of capabilities they should develop to attain or maintain a competitive advantage (Pisano, 2017). The dynamics of capabilities were entirely excluded from both Porter's and the resource-based frameworks (Pisano, 2017). To address and bridge this gap, Teece and Pisano (1994) and Teece

et al. (1997) introduced the "dynamic capabilities" framework, which aids in comprehending firm-level capabilities and their variations (Pisano, 2017). Dynamic capabilities are derived from three factors (Pisano, 2017): i) asset positions, where firms integrate a repertoire of capabilities with their current stock of capabilities; ii) processes, which involve firms' ability to "reconfigure" their asset positions using higher-order routines such as governance structures, resource allocation processes, and management systems; and iii) paths, which represent a commitment to identifying and adhering to a strategy for creating capabilities that lead to competitive advantage.

## 1.8 Qualitative Research Design

The selection of a research design, whether qualitative or quantitative, should be directed by the nature of the research question (Morrow, 2007; Tuffour et al., 2017). Qualitative research is especially suitable for addressing "How?" or "What?" questions, rather than "Why?" (Creswell, 1998; Morrow, 2007). Additionally, it is the most effective method for comprehending the meanings individuals ascribe to their experiences (Tuffour et al., 2017; Morrow, 2007). Qualitative research methods are instrumental in examining variables that are difficult to identify or have yet to be recognised (Morrow, 2007; Tuffour et al., 2017). These methods are also valuable for exploring subjects with minimal or no prior research and for resolving inconsistencies in the literature due to variables that have been defined prematurely, inaccurately, or inadequately (Morrow, 2007; Tuffour et al., 2017). In the absence of established theories to elucidate phenomena, qualitative approaches aid in the development of new theories (Morrow, 2007; Tuffour et al., 2017). Additionally, when a process or phenomenon is not well understood, qualitative research can reveal new or unexpected insights (Creswell, 1998;

Creswell, and Poth, 2016; Marshall and Rossman, 2014; Morrow, 2007). Qualitative research is suitable for providing a detailed and in-depth perspective on a phenomenon (Fossey et al., 2002; Morrow, 2007). While quantitative methods offer a broad understanding, qualitative approaches can explore complex processes and reveal the intricate nature of human phenomena (Morrow, 2007).

Given that circular entrepreneurship is a novel phenomenon lacking established theories, the author employs a qualitative research design to gain an in-depth understanding of its nature.

Qualitative approaches are also underpinned by an interpretive strategy within social science, providing a contextual understanding of organisations (Reinecke et al., 2016). The strength of qualitative research lies in its capacity to elaborate on or generate theory, rather than merely testing it (Reinecke et al., 2016). In this context, this research chooses an interpretive approach that help to understand CE- related organisations.

### 1.8.1 Research Philosophies

The choice of qualitative research is influenced by five philosophical assumptions: ontology, epistemology, axiology, rhetorical, and methodological assumptions (Creswell, 2007; Hays and Singh, 2012; Ponterotto, 2005). A qualitative researcher adopts a position on each assumption, which significantly affects the design and execution of the research (Hathaway, 1995; Creswell, 2007).

Ontology examines the nature of reality (Spencer, 2014). In other words, ontology pertains to one's perspective on the nature of reality (Tuffour et al., 2017; Morrow, 2007). In qualitative research, it addresses beliefs regarding the existence of a "universal truth" and objectivity (Spencer, 2014). At one extreme, ontology posits that reality is objective and that universal

truths about it can be discovered (Spencer, 2014). At the other end of the spectrum is the view that reality is subjective and context-dependent, suggesting that a universal understanding of psychological experiences is unattainable because they must be interpreted within their specific contexts (Hays and Singh, 2012; Spencer, 2014). In these perspectives, circular entrepreneurship is a subjective matter that is context dependent and circular entrepreneurship can explain in Bangladesh context and look into a broad entrepreneurial domain.

Epistemology investigates the process of knowing, or "how we know what we know" (Guba and Lincoln, 2008; Ponterotto, 2005; Spencer, 2014). It explores how knowledge about existence is acquired and the relationship between the researcher and the world (Spencer, 2014; Tuffour et al., 2017). From this perspective, researchers and participants are seen as independent, allowing for the use of rigorous, systematic methods to study participants objectively and without researcher bias (Spencer, 2014). Similarly, epistemology concerns the understanding of that reality and the relationship between the knower and the known (or the investigator and participants) (Tuffour et al., 2017; Morrow, 2007). In this circular entrepreneurship research, researcher is independent and takes an unbiased stance hence epistemologically researcher tries to understand circular entrepreneurial process in-depth in the context of Bangladesh.

Axiology examines how the values and assumptions of the researcher impact the scientific process and the subsequent use of research findings (Lincoln et al., 2013; Spencer, 2014). Axiology involves the role of values in research (Morrow, 2007). It questions the role of the researcher's emotions, expectations, and values in the research process, considering whether systematic measures should be taken to prevent these factors from influencing participants and results. Alternatively, it explores whether it is more realistic for researchers to identify,

describe, or attempt to "bracket" their values (Wertz, 2011; Spencer, 2014). In this research, researcher's emotions, values, expectations didn't impact the research outcome.

Rhetorical assumption indicates the language of research that researcher uses for investigation (Creswell, 2007). Over time, a specific rhetoric for qualitative research discourse has developed (Creswell, 2007). Qualitative researchers typically adhere to the rhetorical assumption that their writing should be personal and literary (Creswell, 2007). They utilise metaphors, write in the first person ("I"), and often structure their narratives with a clear beginning, middle, and end, as seen in narrative research (Clandinin and Connelly, 2000; Creswell, 2007). Rather than using quantitative terminology such as "internal validity," "external validity," "generalizability," and "objectivity," qualitative researchers might use terms like "credibility," "transferability," "dependability," and "confirmability" (Lincoln and Guba, 1985; Creswell, 2007) or "validation" (Angen, 2000; Creswell, 2007). Additionally, naturalistic generalisations (Stake, 1995; Creswell, 2007) and terms like "understanding," "discover," and "meaning" are common in qualitative research. The current research, researcher tries to understand the circular entrepreneurship antecedents, elements, outcomes, paradoxes, capabilities and hence discover the true reality and the nature of circular entrepreneurship with a transference way.

Methodology, informed by ontology, epistemology, and axiology, addresses how knowledge is acquired (Guba and Lincoln, 1994; Morrow, 2007). In methodology, the fundamental question pertains to the process of conducting research. In this context, the researcher employs inductive reasoning, investigates the topic within its specific context, and utilises an evolving design (Creswell, 2007). The researcher prioritises detailed particulars before making generalisations, meticulously describes the study's context, and continually refines questions based on experiences in the field (Creswell, 2007). In the same token, this research follows a rigorous research methodology based on the research question and employs inductive reasoning.

### 1.8.2 Research Paradigm

A paradigm is defined as a "basic set of beliefs that guides action" (Guba, 1990, p. 17; Morrow, 2007) and can be viewed as a "net" encompassing the researcher's ontological, epistemological, axiological, and methodological assumptions. While research paradigms continually evolve, four major paradigms prevalent in qualitative research are postpositivism, constructivism, advocacy/participatory, and pragmatism (Creswell, 2007). However, Morrow (2007) divided paradigms as postpositivism, interpretivism-constructivism, and ideological-critical theories (Teherani et al., 2015). Each paradigm offers a distinct approach to knowledge claims, differing markedly in their characteristics (Tuffour et al., 2017; Morrow, 2007; Creswell, 2007).

Postpositivism is the belief that there is a real world, but we can't completely understand it (Teherani et al., 2015; Morrow, 2007). Researchers in this field try to be as objective as possible, though they know perfect objectivity is not achievable (Guba and Lincoln, 1994; Morrow, 2007). They aim to stay neutral and free from personal bias. Postpositivists use both numerical data (quantitative methods) and some non-numerical data (qualitative methods) in their research (Helms et al., 2006; Worthington and Whittaker, 2006; Morrow, 2007).

The interpretivist-constructivist paradigm believes that reality is different for each person, including the researcher (Morrow, 2007; Teherani, 2015). The meanings of things are created together by the participants and the researcher (Guba and Lincoln, 1994; Morrow, 2007). In this view, the researchers' values and subjectivity are considered important parts of the research process (Fossey et al., 2002; Morrow, 2007). In the current research, researcher follows an interpretivist-constructivist paradigm where researcher tries to understand circular entrepreneurship engaging with participants from different industries in Bangladesh.

Critical-ideological paradigms, similar to the interpretivist-constructivist perspective, recognise the existence of multiple realities while also acknowledging a "real" reality

associated with power and oppression (Fossey et al., 2002; Morrow, 2007). This reflects a critical realist ontology and a transactional epistemology (Kincheloe and McLaren, 1994; Morrow, 2007). They value subjectivity, both their own and that of their participants, and are dedicated to social justice and the eradication of oppression, resulting in a value-laden axiology (Fossey et al., 2002; Morrow, 2007).

## 1.9 Methodology

In this study, the researchers have implemented a qualitative research design, which is particularly apt for exploring emerging and innovative fields (Zhang et al., 2022; Fields, Z., 2015; Markard et al., 2012; Truffer, 2022). Furthermore, a multifaceted approach has been utilised, combining both inductive (qualitative data-driven) and deductive (theory-driven) methods within an extensive interpretive methodological framework (Paul, K.B., 2017; Goldkuhl and Cronholm, 2010; 2018).

The author developed a theoretical model within the framework of Dynamic Capability Theory to examine the dimensions of sensing, seizing, and transforming in CE. The study adopted a case study methodology to empirically investigate issues related to circular entrepreneurial aspects (Yin, 2013; Tellis, 1997). This exploratory investigation aligns well with the research questions, resulting in the implementation of a multi-case study approach. Given the novel and complex nature of issues surrounding circular entrepreneurs in industrial contexts, the application of the multi-case study approach has enabled a more profound exploration and comprehension, effectively addressing the research questions. Additionally, multi-case analysis has yielded valuable insights across diverse contextual settings and various industries (Zhang et al., 2022; Bass et al., 2018; Cao et al., 2013).

### 1.9.1 Data Collection Context

The study was conducted in Bangladesh, a nation recognised as one of the most vulnerable to the impacts of climate change globally (World Bank, 2014; Climate Change Vulnerability Index, 2014; Nurunnabi, 2016). Over the past two decades, Bangladesh has accounted for 60% of global fatalities from climate change-related events such as cyclones and floods (Nurunnabi, 2016). Additionally, as an emerging economy, Bangladesh is among the countries most severely impacted by environmental issues, particularly air quality (Ahmed et al., 2022). The concentration of fine particulate matter (PM 2.5) pollution in Bangladesh is reported to be six times higher than the levels recommended by the World Health Organization (WHO) (Ahmed et al., 2022).

Furthermore, Bangladesh is the eighth most populous country globally, with a population of 173 million (Nurunnabi, 2016). As a significant producer and exporter of textile products, it is particularly susceptible to the adverse environmental effects of textile manufacturing, among other industries (Angel et al., 2015). Similar to many other emerging economies, most industries in Bangladesh, including the textile sector, exhibit low levels of environmental awareness. Although some businesses have adopted environmental initiatives, the majority remain oblivious to the environmental repercussions of their industrial activities (Majumdar and Sinha, 2019).

Moreover, Bangladesh is the eighth most populous country in the world, with a population of 173 million (Nurunnabi, 2016). As a major producer and exporter of textile products, it is particularly vulnerable to the adverse environmental impacts of textile manufacturing and other industries (Angel et al., 2015). Like many other emerging economies, most industries in Bangladesh, including the textile sector, display low levels of environmental awareness. While

some businesses have implemented environmental initiatives, the majority remain unaware of the environmental consequences of their industrial activities (Majumdar and Sinha, 2019).

### 1.9.2 Data Collection Method

The author employed in-depth, semi-structured interviews for primary data collection, chosen for their flexibility and ability to facilitate comprehensive discussions (Eisenhardt, 1989). The interview questions are listed in Appendix A, and profiles of the participating firms are detailed in Table 1. The interviewed entrepreneurs, including business leaders and presidents of professional organisations, possess extensive experience, with some having over four decades in the manufacturing industry. This diverse and experienced group has significantly enriched the research, providing valuable insights into circular entrepreneurship in industrial contexts.

To enhance research robustness, the author employed triangulation principles (Tracy, 2010), using multiple secondary data sources to corroborate interview findings. This approach validated the interview insights. Additionally, interviewing multiple representatives from the same firm provided diverse information and valuable perspectives from various backgrounds.

To ensure the validity and reliability of their data collection, the authors conducted a thorough consistency check across various interviews. In line with Yin's (2009) recommendations for assessing construct validity, the researchers incorporated semi-structured interviews from multiple sources. Moreover, two impartial senior academics reviewed the findings to provide an additional layer of validation. To address internal validity concerns, the authors adhered to a structured data coding and analysis process, following the guidelines outlined by Yin (2009).

### 1.9.3. Details of Coding Protocol

The researcher strictly adhered to the coding protocol as part of their methodology to ensure validity and reliability in qualitative research (Williams and Moser, 2019). The coding process involves three phases: open, axial, and selective coding. In open coding, researchers identify key concepts and themes from raw data, organising them into broad categories (Williams and Moser, 2019). Axial coding refines these themes, categorising data and identifying links between open codes (Williams and Moser, 2019; Strauss, and Corbin, 1990). In selective coding, the final phase, the researcher integrates these categories into coherent constructs, refining the study's narrative (Flick, 1992).

The careful refinement of data is pivotal to this process, allowing the development of a cohesive narrative or case from the data categories. This involves carefully selecting the primary thematic category and systematically aligning this core theme with other categories that have been processed through selective coding. This method is essential in shaping the results of selective coding into a coherent 'case' or 'story' (Strauss, and Corbin, 1990). Consequently, it equips researchers with versatile and multifaceted means to encode and present their study's findings.

### 1.9.4 Data Validity and Reliability

To ensure external validity, the researchers employed a multi-case approach and purposive sampling, adhering to established field practices. In qualitative research, the sample size is often small, but the volume of data collected can be substantial (Fossey et al., 2002). This data might come from numerous hours of participant interviews or various sources from a single setting, such as interviews, observational field notes, and written documents (Fossey et al., 2002). There's no set minimum number of participants required for robust qualitative research,

but it's essential to collect enough detailed information to thoroughly explain the phenomena under investigation (Fossey et al., 2002).

For reliability, a comprehensive case study protocol was used, including systematic data recording, transcription, and iterative team discussions (Yin, 2008). Each interview typically lasted between 40 and 60 minutes. A variety of evidence sources were employed to ensure construct validity, including semi-structured interviews and diverse forms of secondary data. To establish a robust chain of evidence, multiple interviewees within the organization were engaged whenever possible. This approach helped triangulate the data and enhance the reliability of the findings.

The findings underwent a rigorous review process, involving assessments by two senior supervisors, who provided critical feedback and guidance. Additionally, interviewees were given the opportunity to review the interview transcripts, offer feedback, and provide clarifications. This iterative process allowed for the refinement and revision of the transcripts, further strengthening the validity and accuracy of the collected data.

Internal validity was rigorously maintained through controlled data coding and analysis, ensuring reliability and accuracy. Measures to bolster validity included reviews by senior academics for critical feedback and involving interviewees in reviewing and clarifying transcripts, thus enhancing data credibility.

External validity was enhanced through purposive sampling, ensuring representative cases that reflect the broader population, thereby improving generalizability. The study also replicated its methods across multiple case studies, demonstrating the robustness and consistency of results across different settings. These strategies made the findings applicable to a wider range of contexts.

Reliability was ensured through rigorous protocols and systematic procedures. I developed a detailed case study protocol to standardise field research and analysis, promoting consistency. A comprehensive case study database, including recordings, transcripts, internal documents, and news coverage, provided a robust foundation for analysis and verification. Regular iterative discussions within the research team further enhanced reliability by enabling cross-validation and addressing discrepancies. These measures ensured the findings were credible, trustworthy, and replicable.

For the purpose of triangulation, we additionally gathered data from company websites and publicly available reports to verify their circular and sustainable practices. The majority of company publications emphasise sustainability and provide relevant information in this regard. However, there is limited information available on recycling and circular practices, which is a significant finding of the present research.

### 1.10 Sample Organisations and Respondent

The researchers utilised purposive sampling techniques to select case firms (Yin, 2013). Purposive sampling in qualitative research intentions to select suitable information sources to explore meanings (Fossey et al., 2002). The selection criteria were predicated on the firms' active engagement in CE practices, including the implementation of circular economy initiatives, a willingness to participate in data collection and interviews, and representation from a diverse array of industrial sectors. To identify and approach entrepreneurs and senior executives from these selected firms, the author leveraged their personal networks, engaged with industrial associations, and collaborated with professional bodies within their research domain.

The initial stage of data collection was carried out through detailed face-to-face interactions, with data quality assessments conducted after obtaining information from each firm. Initially,

data were gathered from 15 case companies between November 2022 and January 2023. Following a preliminary analysis of the collected data, the author decided to extend data collection efforts. The next phase occurred from March 2023 to May 2023. After this second phase, the author chose to collect additional data through online interviews. Further data were collected from January to March 2024 to gain deeper insights into the sensing, seizing, and transforming aspects of the theory. Upon completing this third phase of data collection, the author ultimately achieved theoretical saturation, ensuring the comprehensiveness and validity of the research findings. The respondents were from different background and experienced in the relevant fields.

### 1.11 Limitations.

CE is an emergent concept, and its various aspects are not widely recognised by many entrepreneurs. This lack of awareness represents a fundamental limitation in the current body of research. Despite the conceptual ambiguities surrounding CE, nearly all entrepreneurs acknowledge implementing some form of CE practices within their organisations. The foundational principles of CE—reduce, reuse, and recycle—are generally adhered to, with most entrepreneurs embracing the reduce and reuse principles. However, the recycling principle is not as widely practised within many organisations. Given the novelty of the concept, entrepreneurs often find themselves uncertain about the scope of CE and, consequently, are somewhat reluctant to articulate their progress in transitioning from a linear economy to a circular one.

In addition to these constraints, qualitative research inherently presents other challenges. For instance, securing appointments for face-to-face interviews is particularly challenging. This difficulty arises because top-level managers and entrepreneurs are often extremely busy and disinclined to allocate time for interviews. Furthermore, some entrepreneurs are frequently

travelling abroad for business, making it even more challenging to reach them for interviews. During data collection, selecting appropriate place for face-to-face interview was also challenging. To mitigate this challenge, researcher travel different parts of the country to take face-to-face interview. Face-to-face interview is very important for in-depth data collection and getting non-verbal impression from the interviewees. Facial expression, non-verbal impression, surrounding environment of the factories, locations, recycle facilities are also important for better data collections. Researcher visited some factories to get real pictures, however some interviewees didn't provide permission for visiting the factories for security reasons. Nonetheless, these limitations were mitigated as the researcher was able to find a number of entrepreneurs who were very cooperative and generously provided their valuable time for interviews.

In addition to these general limitations the specific limitations have been described in the following sub-sections.

Every systematic literature review has its limitations. For instance, selecting search strings can be problematic due to the lack of universally accepted standards in the context of CE. Consequently, the author selected search strings designed to encompass a broad range of literature pertinent to circular entrepreneurship. The paper details the diverse vocabulary used to cover the most relevant literature, thereby substantially mitigating these limitations. The researcher excluded scientific papers and conference proceedings, which may constrain the scope of the research. However, by concentrating on recent literature and specifically focusing on the business field, these limitations are mitigated, enhancing the robustness of the research.

The principal limitation of the study on DC and paradoxes is its reliance on 40 qualitative interviews conducted exclusively within the context of Bangladesh. Although a larger number of interviews might have yielded more extensive and detailed insights into circular

entrepreneurship, the researcher achieved a saturation point, which mitigates this limitation. Moreover, the study's focus on Bangladesh constitutes another constraint. This research was funded by the Commonwealth Scholarship Commission (CSC), which expressed interest in understanding the impact of the study within Bangladesh, thereby justifying the choice of Bangladesh as the sample. Future research could adopt a cross-country approach to gain a broader understanding of circular entrepreneurship. Given the nascent nature of the concepts of the circular economy and circular entrepreneurship, obtaining expert opinions proved challenging. While some entrepreneurs and managers possess a commendable track record, specific knowledge on circular economy practices is somewhat limited. This lack of expertise, due to the novelty of the subject, represents an inherent limitation of the study.

Only relying on qualitative research is a limitation of this research. A mix-method of research can improve the robustness of the current research. Future researchers can adopt mix methods understanding and identifying more variables and also look into moderating and mediating effect on circular entrepreneurship.

### 1.12 Managerial Implications

The current research has several significant managerial implications. Firstly, the systematic literature review (SLR) offers a model to guide circular entrepreneurs in transitioning from a linear economy to a circular economy. Although SLR provides more of theoretical but also it provides a direction to managers and entrepreneurs to transition to circular entrepreneurs. Secondly, Chapter 2's discussion of paradoxical theory highlights key paradoxes in circular entrepreneurship that must be addressed during the transition process. Lastly, it is crucial for managers and entrepreneurs to adopt CE principles by leveraging dynamic capabilities. This study examines these principles from the perspectives of sensing, seizing, and transforming,

enabling managers and entrepreneurs to facilitate a smooth transition from a linear to a circular economy. The specific managerial implications are provided in the following:

A SLR predominantly offers theoretical implications by synthesising existing research, identifying gaps, and proposing new frameworks or models. Nevertheless, it can also provide managerial implications by translating theoretical insights into practical guidance for practitioners. Therefore, while the primary focus of an SLR is on theoretical contributions, it can also yield valuable managerial implications.

### 1.12.1 Managerial Implications for Circular Entrepreneurship

The specific managerial implication is that the model presented in the SLR offers guidelines for managers and entrepreneurs on transitioning to a circular economy by identifying its antecedents, elements, and outcomes. Firstly, this model distinctly categorises antecedents at the micro, meso, and macro levels. For the first time, it provides a circular entrepreneurship model that outlines various levels of antecedents, thereby guiding entrepreneurs in identifying the appropriate antecedents and subsequently transforming their existing business models to incorporate circular economy principles within their organisations.

Secondly, the model delineates the components essential for circular entrepreneurs, highlighting various elements that entrepreneurs must consider to transition to a CE. For example, the model categorises these elements into micro, meso, and macro levels. At the micro level, circular entrepreneurs must adapt their business models, supply chains, digitalisation processes, value creation methods, and risk-taking approaches. These components are crucial in aiding entrepreneurs in their transition to a CE. Finally, by employing these elements, circular entrepreneurs can achieve social, economic, and environmental performance. This

distinctive model provides a framework for entrepreneurs to transition to a CE and ultimately attain sustainability objectives.

### 1.12.2 Managerial Implications for Mitigating Organisational Paradox

In case of paradoxical theory (Paper-2), organisations encounter numerous tensions during their transition to a CE. It is imperative for managers and entrepreneurs to clearly understand these tensions and paradoxes to effectively address them within their organisations, thereby facilitating a smooth transition to CE. The initial tension to be addressed involves the decision on whether to regard waste as a resource or merely as waste. If waste is considered a resource, managers must implement specific strategies (R-strategies, i.e., reduce, reuse, recycle) to advance the transition to CE. Secondly, managers and entrepreneurs encounter market paradoxes, resulting in tensions between price and quality, which in turn lead to technology and investment paradoxes. Overcoming these tensions is crucial for the seamless adoption of CE principles. Finally, managers and entrepreneurs must navigate stakeholder paradoxes, both internal and external. Minimising these tensions is essential for entrepreneurs to achieve a smooth transition to CE.

### 1.12.3 Managerial Implications for Achieving Dynamic Capabilities

While dealing with DC theory, circular entrepreneurs must develop dynamic capabilities to transform their organisations, facilitating the shift towards a CE and achieving sustainability. Within this framework, managers and entrepreneurs focus on three primary components of dynamic capabilities: sensing, seizing, and transforming.

In the sensing phase, managers and entrepreneurs scan the environment to identify changes in business and society. Currently, there is an increased awareness among entrepreneurs regarding environmental and climate changes. These changes prompt managers and entrepreneurs to modify their operations to ensure their products are environmentally benign.

During the seizing phase, managers and entrepreneurs must adapt their business models to embrace a circular business model (CBM), thereby integrating CE principles. Furthermore, they need to create new value from existing products and adopt new technologies to ensure compliance with environmentally friendly standards.

In the transformation phase, managers and entrepreneurs align their existing capabilities with new ones to adopt CE principles, thereby gaining competitive advantages.

### 1.13 Policy Implications

Drawing on the empirical study, this research offers several policy implications for the second and third papers. Since the first paper addresses the literature review, we concentrate on providing more rigorous policy recommendations in the second and third papers, which are grounded in field data and case studies.

#### 1.13.1 Policy Implications for Circular Entrepreneurship Model

The key policy implications for SLR suggest that policymakers and governments should adopt our model to promote and facilitate circular entrepreneurship, driving the transition towards sustainability and a circular economy. While governments are concerned with sustainability and are working towards achieving the Sustainable Development Goals (SDGs), they currently lack awareness and a clear agenda on CE practices. Our model will assist policymakers in identifying the essential elements of circular entrepreneurship. These elements will guide the

integration of CE principles within industries and support the development of a circular economy ecosystem.

For instance, policymakers can incentivise circular entrepreneurs, who act as agents of change in transforming organisations towards circularity, by offering tax breaks and other benefits. Our model outlines key factors at the micro, meso, and macro levels that governments can incorporate into their policies, with a focus on short-, medium-, and long-term integration strategies.

In the short term, policymakers can collaborate closely with organisations to help them align their missions and visions with CE objectives. They can also foster partnerships at the meso level between governmental and private institutions. In the medium to long term, at the macro level, governments can support the creation of national and international policies that aid local businesses in adhering to these standards, ultimately promoting sustainability and circularity. Additionally, policymakers could establish initiatives like industrial symbiosis and eco-industrial parks, which would further support businesses within the country in adopting circular practices.

### 1.13.2 Policy Implications for Organisational Paradox

There are several policy considerations that policymakers can address when transitioning to a circular entrepreneurship and dealing with paradoxes. One approach is the adoption of eco-design strategies (D'Adamo et al., 2022) within production and operational processes, wherein producers incorporate environmental factors into product development by balancing ecological and economic demands. Additionally, policymakers could implement economic subsidies (D'Adamo et al., 2022), offering businesses or institutions either direct or indirect tax relief or financial incentives. Such subsidies can incentivise business growth and alleviate financial constraints, fostering further development. Further government can adopt green fiscal policy

and green monetary policy to support circular entrepreneurs (Yu, et al., 2023). Along with these fiscal and monetary policies government also apply green taxes for sustainable and eco-friendly economic practices (Yu, et al., 2023).

Another policy option for governments or policymakers is the 'end-of-waste' strategy (Yu, et al., 2023; D'Adamo et al., 2022), which involves repurposing waste as raw materials or products that will minimize waste-resource paradoxes. Governments and policymakers can provide guidelines to circular entrepreneurs to mitigate potential conflicts arising from the waste-resource paradox. Furthermore, policymakers could offer technological support to facilitate a smooth transition for circular entrepreneurs towards a CE without facing significant challenges. They could also promote industrial symbiosis (Desrochers, 2001; D'Adamo et al., 2022), where the waste generated by one industry serves as input or raw material for another. Policymakers could implement the 'polluter pays' principle (D'Adamo et al., 2022), requiring producers or polluters to bear the costs of mitigating future pollution based on the environmental damage they have caused to society. Finally, government or policy maker can encourage circular entrepreneurs to adopt CE principles in their procurement strategies (Fan and Fang, 2020).

### 1.13.3 Policy Implications for Achieving Dynamic Capabilities

Within the DC framework, the policy implications are multi-layered, necessitating integration across individual, organisational, national, and international levels. This study explores policy evolution from both CE and circular entrepreneurship perspectives. At the local level within the CE framework, policymakers should prioritise R-strategies (reduce, re-use, recycle, and remanufacture) while aligning these strategies with public procurement policies (such as green procurement) and managing secondary product markets. From an international CE perspective, policy evolution focuses on resource efficiency, driven by the global demand for

environmentally friendly products (European Commission, 2015b). In the context of circular entrepreneurship, policy development must support the creation of an entrepreneurial ecosystem with both short-term and long-term measures. Short-term strategies may include providing subsidies, tax exemptions, and expanding governmental facilities, whereas long-term approaches should focus on training, development, and research and development (R&D) to sustain entrepreneurial growth. Additionally, policymakers should promote the transition from a linear to a circular model by integrating all stakeholders and encouraging practices that advance CE and sustainability.

Policymakers must enhance eco-economic policies that promote economic efficiency, sustainability, economic growth, environmental well-being, and a harmonious relationship between nature and humanity (Sarkis and Zhu, 2008). To achieve these objectives and maintain economic efficiency, policymakers should design economic policies that support circular entrepreneurs. In this context, technological development plays a crucial role. While sensing and scanning environment, circular entrepreneurs search for new technologies and if government supports technological development with private companies, then it will bring multiplier effect in the economy boosting economic efficiency.

The primary aim of CE policy should be to encourage entrepreneurs and organisations to utilise natural resources sustainably and to internalise environmental costs into organisational expenses (Yong, 2007). Additionally, policymakers and governments should assist small and medium-sized enterprises (SMEs) in adopting CE principles. For larger organisations, it is essential to impose or encourage adherence to various national and international standards, such as ISO 14000 or ISO 14001, to ensure compliance with environmental best practices (Sarkis and Zhu, 2008). This adoption of standards will support BM redesign and seize the opportunities of CE.

Some scholars advocate for the adoption of local-level policies that involve local administrations in environmental governance (Allen et al., 2019). Concurrently, regional initiatives, such as industrial development that accounts for environmental considerations, are also vital. Governments should promote the sustainable use of energy when formulating industrial policies, as these policies can ensure sustainability and contribute to achieving a nation's sustainable development goals (Shittu, 2020). Furthermore, governments should design industrial policies to enhance organisational capabilities through research and development (R&D), technology transfer, and increased investment in innovation (Labory and Bianchi, 2021). Organisational innovation and transformation are attainable when companies adopt technologies and IT-based governance systems that open up new opportunities and competencies (Luna-Reyes et al., 2020). Organisations can enhance their capabilities through the availability of infrastructure, tax incentives, skilled labour, reliable suppliers, and by implementing integrated and balanced policies (Lessard et al., 2016).

Organisations can also co-create value by collaborating with public administration and enhancing eGovernment, which will strengthen Dynamic Capabilities (DCs) and enable organisations to seize new opportunities (Panagiotopoulos et al., 2023). DCs are regarded as critical success factors for the public sector, as they help address environmental challenges and generate public value for key stakeholders by navigating both internal and external challenges. To improve long-term capacities within the public sector, ministries or policymakers should increase funding for IT and enhance managerial skills (Panagiotopoulos et al., 2023). Developing human resources and improving managerial capabilities will support the transformation process and lead to a circular organisation.

## 1.14 Theoretical Contributions

### 1.14.1. Theoretical Contributions of Circular Entrepreneurship

Theoretical contributions on SLR in the context of the CE and circular entrepreneurship offer groundbreaking insights, given that the concept of circular entrepreneurship remains in its early stages of development. In recent years, the concept of the CE has also garnered significant attention from scholars, both in terms of its theoretical foundations and its practical implementation strategies (Geissdoerfer et al., 2016) that lead to the research on circular entrepreneurship.

Prior to 2006, the CE was not recognised as a distinct field of research; rather, its principles were dispersed across various schools of thought (Merli, et al., 2018), including industrial ecology, environmental sustainability, and engineering disciplines related to recycling and upcycling, reflecting a broad array of antecedents (Bocken et al., 2017). These intellectual traditions have, in turn, contributed to the emergence of literature on circular entrepreneurship, prompting researcher to acknowledge the need for a model that outlines the novel framework of circular entrepreneurship. Hence, the first theoretical contribution of this SLR is to develop a model that shows antecedences, elements and outcomes of circular entrepreneurship. Secondly, this model encourages researchers to examine the challenges of circular entrepreneurship through an empirical lens, offering robust recommendations for addressing the obstacles faced by circular entrepreneurs. Thus, the second theoretical contribution lies in integrating the issues of the CE with related entrepreneurial literatures that have been unexplored and prompting researchers to investigate the concept of circular entrepreneurship empirically.

Thirdly, by integrating literature related to the CE, the current research seeks to stimulate the theory-building process for future scholars in the fields of CE and circular entrepreneurship, thereby contributing to the refinement and clarification of circular entrepreneurship concepts.

Finally, this theoretical foundation will assist scholars, researchers, and policymakers in advancing further research and generating new ideas in the areas of environmental management, sustainability, and circularity.

#### 1.14.2 Theoretical Contributions of Circular entrepreneurship and Paradox

The first theoretical contribution of Paper-2 lies in its identification of various paradoxes within the circular entrepreneurship literature. For the first time, the study explores resource paradoxes, market paradoxes, and stakeholder paradoxes in the context of circular entrepreneurship. Secondly, the researcher connects paradoxical theory with entrepreneurial theories and CE opportunities. This connection enhances our understanding of how circular entrepreneurs encounter and address different paradoxes, and develop strategies to overcome them. In the context of CE, entrepreneurs consistently seek opportunities intertwined with environmental challenges, which inherently generate tensions and paradoxes. Entrepreneurs continually update their knowledge and resources (Audretsch and Fiedler, 2024) to adopt and seize CE opportunities, thereby mitigating tensions and paradoxes.

The third theoretical contribution of this paper lies in its extension of the circular entrepreneurship literature, offering insights into the various tensions that circular entrepreneurs encounter when adopting CE principles. The research elucidates key paradoxes and strategies for overcoming them. For example, while waste-resource paradoxes (Greer et al., 2021) have been discussed in existing literature, there remains a lack of clarity on how circular entrepreneurs manage these paradoxes in their production and operational processes.

This study provides a framework that can guide researchers in navigating the major paradoxes within CE contexts.

Finally, this study investigates novel variables within the framework of CE and circular entrepreneurship. The researcher has identified variables related to waste-resource paradoxes, such as R-strategies. In the context of market paradoxes, significant variables have been identified that are crucial for transitioning to a CE, including pricing, quality, production and operations, technology, and investment. These variables are essential for both circular entrepreneurship and CE transformation, and this paper provides an analysis of them within the Bangladeshi context. Discussing these variables in the context of Bangladesh, an emerging nation in South Asia, represents a novel contribution to the CE literature. Regarding stakeholders' paradoxes, the research identifies key variables, including internal and external stakeholders. Internal stakeholders are those directly impacted by the transition to CE, whereas external stakeholders are those who enforce various regulations and policies to facilitate the adoption of CE. Previous literature on circular entrepreneurship failed to articulate these issues, hence these variables are noble contribution of this research.

### 1.14.3 Theoretical Contributions of Circular Entrepreneurship and Dynamic Capability

The primary theoretical contribution of Paper-3 resides in its identification of various dynamic capabilities within the literature on circular entrepreneurship. To the best of the researcher's knowledge, this study is the first to explore dynamic capabilities in terms of sensing, seizing, and transforming within the context of circular entrepreneurship.

Additionally, the researcher integrates dynamic capabilities theory with entrepreneurial theories, circular entrepreneurship concepts, and CE opportunities. This integration deepens

our understanding of how circular entrepreneurs engage with and address the distinct components of dynamic capabilities, formulating strategies to sense, seize, and transform organisations. Within the context of CE, entrepreneurs consistently pursue opportunities that are intertwined with environmental challenges, aligning their business strategies accordingly to adapt to these changes. Entrepreneurs also continuously update their business models and resources (Audretsch and Fiedler, 2024) to adapt to and capitalise on CE opportunities.

A further theoretical contribution of this paper is its expansion of the circular entrepreneurship literature, providing insights into the various capabilities that circular entrepreneurs engage with when implementing circular economy (CE) principles. The research elucidates key capabilities and strategies essential for overcoming challenges in the transition to circular entrepreneurship and the adoption of CE principles. For instance, in the discourse on resources, circular entrepreneurs determine resource allocation, which facilitates the adoption of technology and ultimately advances circularity. Additionally, this study presents a framework to assist researchers in navigating the critical capabilities within circular entrepreneurship contexts.

This study also explores new variables within the framework of circular entrepreneurship and the CE. The researcher identifies variables linked to environmental discourse, including CE standards, international standards, market demand, and buyer pressures. In the realm of resource discourse, the variables encompass resource commitment, technology adoption, CE ecosystems, and circular BM, all of which contribute to advancing circular organisations. To secure a competitive advantage, circular entrepreneurship relies on variables such as stakeholder support and government backing, which are crucial for transitioning to a CE. These variables are fundamental to both circular entrepreneurship and CE transformation, and this paper provides an in-depth analysis of them within the Bangladeshi context. The discussion of these variables in relation to Bangladesh offers a novel contribution to the CE literature.

## Chapter Two

### 2. Circular Entrepreneurship: A Systematic Literature Review of Antecedences, Elements and Outcomes.

#### Abstract

The world's need for transitioning to a circular economy (CE) that has created abundant opportunities for entrepreneurs. Academic research in circular entrepreneurship (CEps) has been rapidly growing in recent years, but it is unclear what the current state of research is in the domain for informing future research endeavors. This study addresses this knowledge gap by conducting a systematic review of the state-of-the-art. Our content analysis results reveal distinctive clusters related to circular entrepreneurship antecedents, elements, and performance outcomes. Authors develop a framework that integrated the recent CEps research and provide a model for CEps. The study calls for research in several important but largely ignored research areas including CEps antecedence, its elements such as circular business model (CBM), circular start-up, circular supply chain (CSC), circular technological innovation, circular education and knowledge, circular product-service system, and industrial symbiosis. The current conceptual framework has investigated the development of CEps and provide a comprehensive model of CEps by synthesizing existing literatures. Researchers followed a systematic literature review and revealed that the CEps is an emerging trend to adopt CE concepts and to exploit opportunities created by CE. Through a content analysis, researcher has found its antecedents, elements and outcomes and provided our model based on the variables identified in each category. This is the first comprehensive CEps model that combines

entrepreneurial elements with a holistic view of CE. Contrary to the few previous models on CEps, this model on CEps provides distinct features that addresses regenerative and recyclability of product to protect and restore environmental issues. Researcher also provides future research directions based on the model developed in this study.

## 2.1 Introduction

The world is now facing severe global warming, climate change, carbon emission and other environmental problems. To face those challenges, we need sustainable production and consumption and CE could be an initiative of these sustainability efforts (De Angelis, 2020). The transit to linear economy to circular economy is happening gradually and in this transition, CEps can play a vital role.

While the pieces of literature related to CEps are growing sporadically in business and social sciences, there is a dire need to shape CEps's model and its conceptual framework. Although the literature of CEps is mounting rapidly, however, the concept itself provides contradiction among scholars. So, to remove the misconception and guide the field there is a dire need to emerge an SLR. Hence, **the main objective of this research** is to investigate CEps process through a systematic literature review and provide a conceptual and comprehensive model on CEps and define what does it really mean. Although, there are several papers on CE ( Suchek et al., 2022) but so far our knowledge goes, there are no SLR on CEps. So, it is the first attempt to provide a comprehensive model on CEps through a systematic review on CE and CE-related entrepreneurship papers. The current paper will significantly contribute in the literature of CEps by providing deeper insight and theoretical base on the research of CEps and its different dimensions to guide and promote future research on CEps.

Furthermore, the study aims to enrich knowledge accumulation in the CEps, and to see how CEps can contribute to solve the sustainability issues. For doing this, researcher investigated the CEps literature and found the current literature only related to CE and clustered as; **green startup** (Duberg, et al., 2020; Lauten-Weiss and Ramesohl, 2021; Zhou and Park, 2021), **circular supply chain** ( Farooque et al., 2019; Zhang et al., 2021; Mastos et al., 2021; González-Sánchez, 2020), **circular business model** (CBM) (Brown et al., 2021; Fidan et al., 2021; Guldmann and Huulgaard, 2020; Gatto and Re, 2021), **product service system** (Han et al., 2020; Evrard et al., 2021; Zhou et al., 2021), **circular product design** (Sumter et al., 2018; Guldmann and Huulgaard, 2020), **prolong life cycle** or material loop or life cycle assessment (LCA), or **cradle-to-grave life cycle** (Fidan, 2021; Mendoza et al., 2019; Hoffmann et al., 2020). From the above evidence it is clear that there is dearth of established research on CEps model. Although entrepreneurship is not a new concept but emergence of CE related entrepreneurship is of course somewhat new as those entrepreneurs dedicated their business in CE. CE facilitates and induces new and exclusive type of entrepreneurship and Zucchella and Urban (2019) termed this as “Circular Entrepreneurship (CEps)” where entrepreneurs explore and exploits CE related opportunities. However, this definition of CEps needs to extend in the light of current CEps trend by combining entrepreneurial characteristics to remove contradiction and confusion among scholars. Contrary to Cullen and De Angelis (2021), who looked at the CEps in the perspective of business model (BM), whereas in this study, researcher characterises CEps from overall perspectives of new business development, startup, value creation, servitization and other entrepreneurial perspectives (Zhu et al., 2019; Crecente et al., 2021; Flygansvær et al., 2019; Rodrigues and Franco, 2020).

The evolving literature covering CE-related entrepreneurship concepts indicate some common features such as: i) the development of new business related to CE ii) the barriers and enablers

of entrepreneurship in the new circular context iii) emergence of new and innovative BM and product design iv) entrepreneurial initiatives in advanced technological product and services (i.e., product-service systems, value co-creating and so on), v) circular supply chain and its related issues. Almost all the literature related to CE integrates environmental concerns and proposed to the adoption of CE, however, linking entrepreneurial initiative in CE as a means to solve the sustainability issues still missing in the present context. Some literature suggests developing a sustainable model for entrepreneurship for wider societal and environmental perspectives (Johnson and Schaltegger, 2020), but the challenging part is the accumulation of the contents from diverse and emerging issues of CEps. Researcher critically analyzes those issues and accumulate them in our framework through content analysis.

Infiltrating the current literature on CE-related entrepreneurship, researcher also found that there is a lack of theoretical development on contemporary entrepreneurial initiatives which creates confusion among researchers, academicians, and policymakers. Although green startup (Greer et al., 2020; Zhou and Park, 2020), product-service system (Cherry and Pidgeon, 2018; Pialot et al., 2017) and other related concepts clearly indicate the need for a model on CEps, but unifying knowledge on new entrepreneurial initiatives in a single frame is also another missing part of the contemporary entrepreneurship literature. Researcher strongly believes that the present study and presented model will minimize this gap to a large extent.

Nonetheless, the **first** contribution of this paper is to provide an SLR on CEps to develop an integrated model on CEps, because the current literature on CE failed to provide any SLR on CEps and there are no specific model on CEps. The plethora of entrepreneurship literature related to CE also failed to identify and distinguish special characteristics of CEps. The emergence of new circular economic phenomenon provides the opportunities to CEps to adopt

the principles of CE and modify the existing BM. Hence, an SLR on CEps and theoretical development on CEps will streamline and guide the field in the right direction.

The **second** contribution of this paper is synthesizing the existing entrepreneurial literature with CE literature and fit CEps framework within entrepreneurial domain. This crafting of entrepreneurial conceptions validates the framework and derive the model of CEps as an output of the research. Authors provided a unified model and cover critical issues of CEps in the domain of CE.

**Finally**, this study identifies CEps antecedents, elements and outcomes and link the CEps with the sustainability issues. This conception provides a road-map towards circularity to solve the most pressing problem of the world. Moreover, the model makes a significant contribution to theory development within the field of entrepreneurship, as comprehensive models of CEps are currently limited in the literature. To date, only a few studies have addressed the issue of CEps, and conceptual development in this area remains scarce. Therefore, streamlining the study of CEps is urgently needed in the present context, as the global shift towards circularity and sustainability accelerates. This research will promote further conceptual and theoretical advancements in both CE and sustainability entrepreneurship.

The rest of the paper is organized as follows: Section-2 provides methodology which includes data collection process, metadata analysis, and also provides details on data characteristics. Section 3 provides descriptive statistics including data characteristics, industrial characteristics, number of articles by years. Section-4 discusses details on antecedence, elements and performance outcomes of CEps. Section-5 provides a framework for CEps by synthesizing with entrepreneurial research. Section-6 provides conclusions, limitations and future research directions.

## 2.2 Research Methodology

### 2.2.1 Data Collection Process

In this study, researchers followed a systematic literature review as suggested by Bergman and McMullen (2021), Tranfield et al.(2003), Popay et al. (2006), Short(2009), because the method provides comprehensive and transparent conceptual and empirical work (Bergman & McMullen, 2021). Therefore, researcher employed several steps for maintaining a consistent and clear approach, such as i) Choosing keywords and determining sample ii) Sample screening with Prisma Model; iii) Coding; iv) Analysis. The details of the data and screening process have been attached in the appendix section of this study.

**At the very beginning** we selected our key words that encompasses, circular economy and entrepreneurship, circular economy and new business; circular economy and self-employment, circular economy and self-employed, circular economy and start-up. Researcher used both inverted comma (“ ...”) and without inverted comma while searching in the database. Searching with inverted comma finds words in specific order and finds results exactly matching those words. On the other hand, without inverted comma provides all of the key words results without maintaining the orders, i.e., finds every key words in the texts. Researcher used two major databases in searching the articles, Web of Science and Scopus. Combining both prominent databases provide more reliable search results. Researcher also checked ABI and EBSCO to see whether researcher missed any business related journal articles or not.

Researchers limit their search in Business, Management, Accounting, Economics and Econometrics, and Social Sciences. Our search queries are consistent with previous studies namely Shepherd et al., (2015); Sutter et al., (2019), Bergman and McMullen (2021). In the initial search, author limited his search in key words, titles, abstracts in all databases mentioned above.

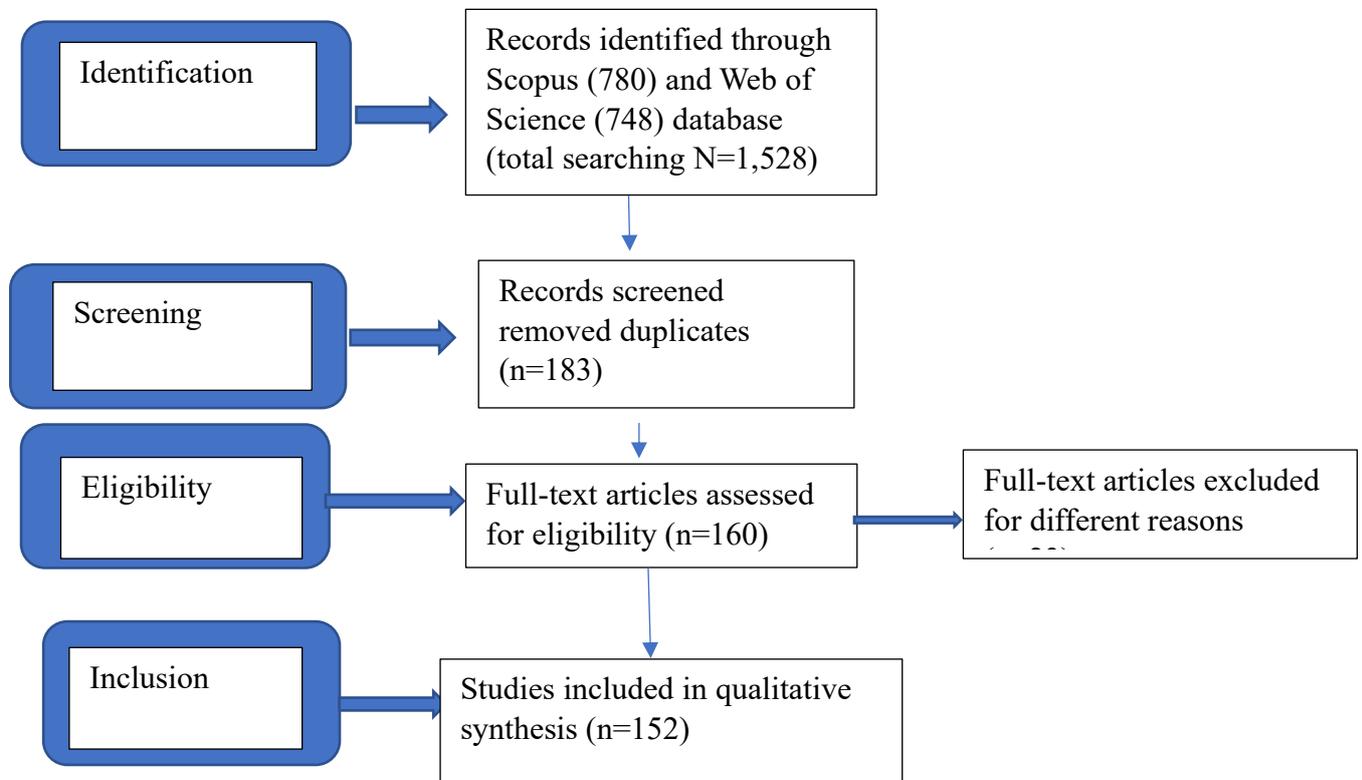
As an initial step (Table 1), the researchers conducted a search for the terms "Circular Economy" and "Entrepreneurship" in the Web of Science and Scopus databases. Then researchers screened the article titles, keywords and abstracts. Researchers follow the similar method in searching the other keywords such as, "Circular Economy" and "Self-employed", "Circular Economy" and "Self-employment", "Circular Economy" and "Startup", "Circular Economy" and "New Business". Both the data base combinedly provided 1,215 articles.

For details, please see the Table-1, and to see the refining/removing duplication process please see figure-1. After removing duplication, finally, researcher extracted 183 articles that are relevant and researcher kept all articles for further screening. Those 183 articles were reviewed for full text and finally we found 152 articles that are most pertinent for our research purpose. We revised and finished our search on 30<sup>th</sup> September 2024.

We considered only journal articles and we eliminate books (except one), book chapters, conference proceedings, and organizational reports (Acerbi and Taisch, 2020). However, only one book relevant to our topic we considered which is written by Zucchella and Urban (2019) and the book name is "Circular Entrepreneurship: Creating Responsible Enterprise". Moreover, we eliminate non-English articles from our search (Acerbi and Taisch, 2020), and we focused global context in our literature search (Table-7).

In the screening process, we also examined journal's quality, studied carefully titles and abstracts for relevance, and studied full text for finding variables and key research dimensions. Further, we carefully read articles for taking notes for our descriptive and metadata analysis. We used MS Excel for coding and analysis and manually inputted the articles information and logically arranged them. We identified characteristics of the papers such as whether empirical or conceptual, qualitative or quantitative, literature and theories used, journals by years, geographical location, and country of origin (Bergman and McMullen, 2021). A summary of

total search process such as Identification, Screening, Eligibility, and Inclusion has been displayed in Figure-1, which also represents Prisma Model.



**Figure 1.: Flow Chart Method Used in this Study, “ Prisma Method”**

**Adopted From:** Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group\*. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of internal medicine*, 151(4), 264-269.

## 2.3 Descriptive Statistics

### 2.3.1. Geographical Location

It is interesting that most of the research (56%) in circular economy and new business model and other new research dimensions happening in the EU regions in our findings. This is because EU is the pioneer in the transition to the circular economy (Mhatre et. al., 2021) and CE research by providing a roadmap to resource efficient Europe in 2011 and by providing an

Action Plan towards CE in 2015 (Domenech and Bahn-Walkowiak, 2019). Moreover, the European Commission is committed to improve European economy through resource efficiency by transitioning into CE (Domenech and Bahn-Walkowiak, 2019).

Out of 152 total research papers (N=152) in our search, 85 papers are from EU regions (56%). On the other hand, Asian, South America, North American regions, Central America belongs only 9%, 6%, 4%, and 1% respectively. However, 22% articles did not provide specific regions or did not mention regions in their articles. Please see Table-7 for details.

**Table-2. : Geographical Location**

<b>EU</b>	<b>Asia</b>	<b>Not specific</b>	<b>South America</b>	<b>Central America</b>	<b>Latin America</b>	<b>Africa</b>	<b>North America</b>	<b>Total (N)</b>
<b>85</b>	14	34	9	1	1	2	6	152
<b>56%</b>	9%	22%	6%	1%	1%	1%	4%	100%

### 2.3.2 Industry Characteristics

The environmental impact has been assumed due to pollution, emission, waste and landfill that are outlined as cause for the CE research (Lieder and Rashid, 2016). The output of industrial systems after consumption is waste and emission and CE tries to reduce emission and landfill generally caused by these industrial systems (Lieder and Rashid, 2016). In this perspective, we found that most of the articles coming from overall manufacturing industries. On the other hand, diverse industrial sectors are getting interest in CE research. Manufacture of textile and wearing apparel is the single sector where most research publications are found. Please see the details in the Table- 3, and figure-2, in the appendix. In case of categorization of Industries, we used International Standard Industry Classification (ISIC).

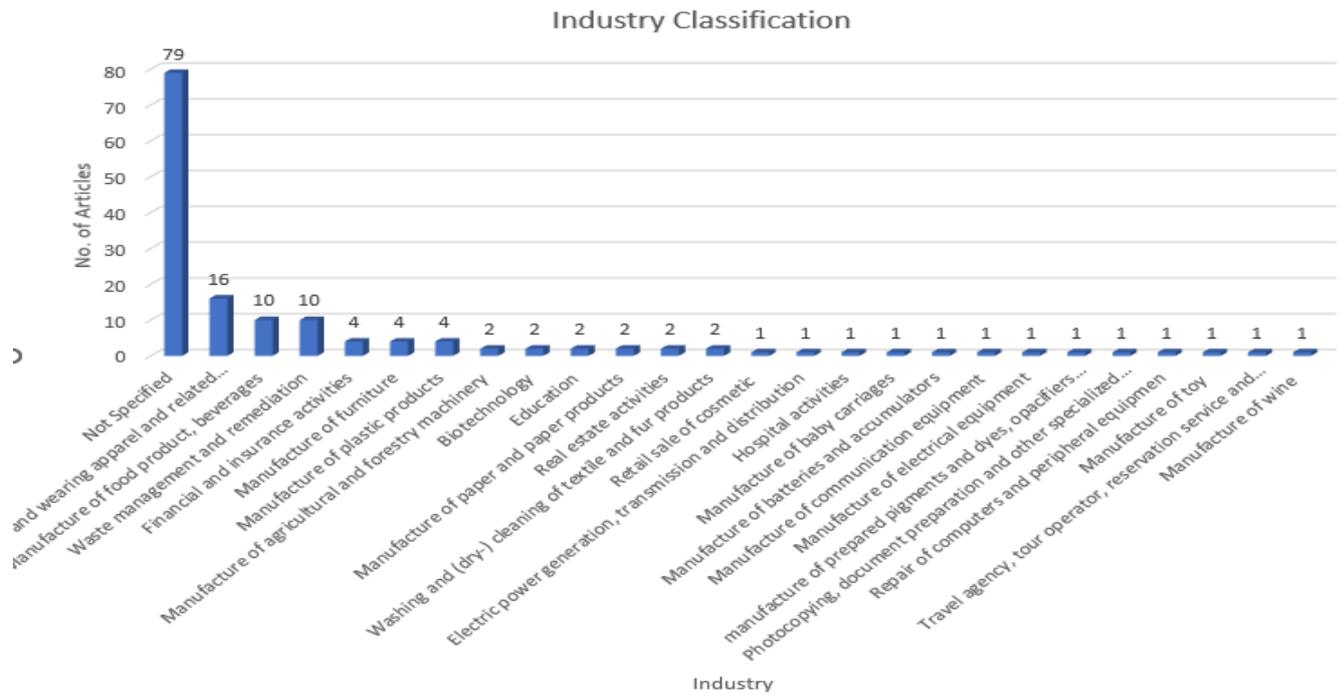


Figure-2 Industry Characteristics.

### 2.3.3 Number of Articles by Year

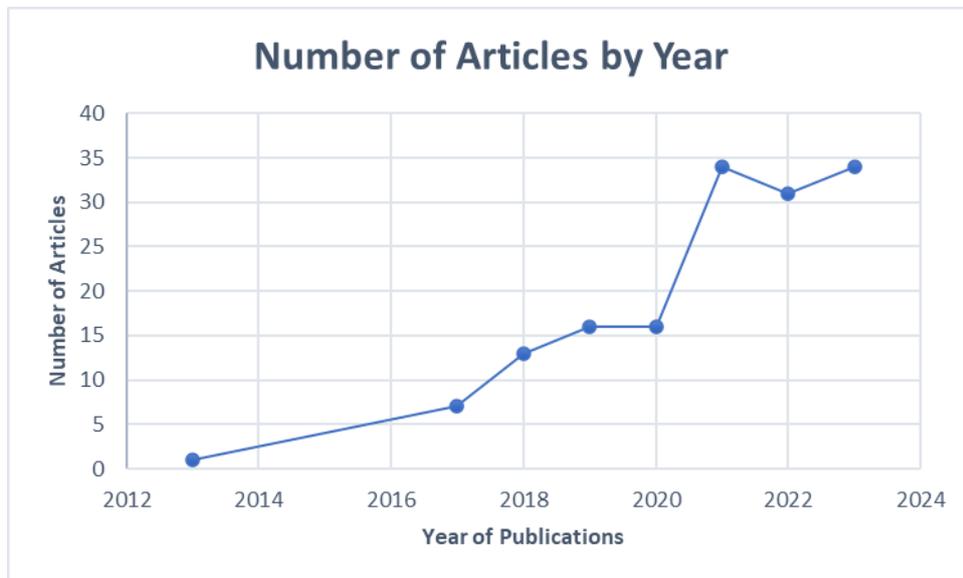


Figure 3: Number of articles by year.

The amount of CE research is expanding daily. As the Mac Arthur Foundation sets off on its adventure, its research is expanding at an exponential rate. Since 2013, there has been a steady increase in CE papers, and between 2020 and 2022, there was an exponential expansion in this field's study.

However, after 2021 a slow growth has been observed, however, it got momentum again after 2022 and growing exponentially.

### 2.3.4 Data Sources

Referring to Table-5, 66% of the articles collected data from primary sources, and 29% data are from secondary sources only, 2% articles followed mixed methods and 3% data didn't define sources. Please see the Table-5 and excel files for full details of data collection and methods.

### 2.3.5 Data Analysis Method

Most of the articles used qualitative method of data analysis (104 out of 152, makes 68%). Only 32 articles (21%) out of 152 used quantitative methods. 11% articles followed mixed method (16 out of 152). CE is a new phenomenon so that most of the studies are qualitative in nature and mostly use case-study method for data analysis.

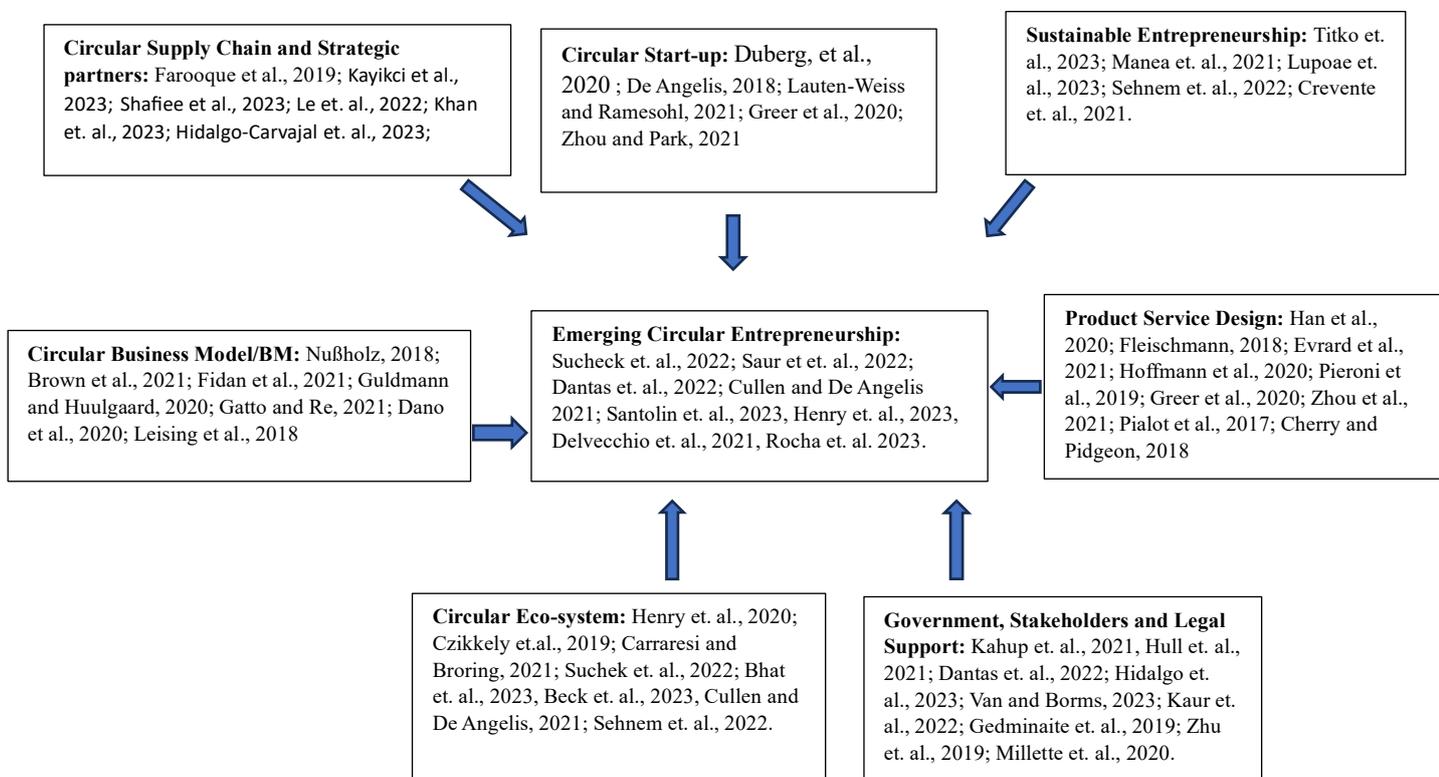
### 2.3.6 Theory Development Approach

We didn't get intensive theory used in those articles. The following theories are found in several articles: Capability and Dynamic capability theory, Contingency theory, Grounded approach

theory (Hull et. al., 2021), theory of effectuation (Bocken et.al, 2017). So, there are lots of opportunities to use theory in the CEps domain.

## 2.4 Circular Entrepreneurship and Circular Economy Research From Literature Review

The following figure shows the current circular entrepreneurship and circular economy research with research clusters.



**Figure 4:** Circular Entrepreneurship and Circular Economy Research with research clusters.

Authors own findings.

## 2.5 Circular Entrepreneurship Content Analysis

Authors followed Goyal and Kumar (2021) where they developed a concept matrix for content analysis which contain details of articles such as titles, authors, abstracts, objectives, methodologies, and findings. Similarly, the study followed the process and input those data in excel file. Finally, researchers come up with the following research streams as elements of CEps: circular business model (CBM), life cycle assessment, industrial symbiosis, circular supply chain, green or circular start up, circular design or design thinking, eco-industrial parks along with other elements (please see table below for details). However, as output of the content analysis authors found that sustainability issues are well discussed in the extent literature such as environmental, social and economical issues, resource efficiency, urban sustainability, economic growth, reduction in environmental effects. The process also supported by Seuring and Gold (2012), where they analysed content in two levels. First, they analyse the content of texts through statistical methods. Secondly, they evaluated and explained the latent content of the texts and documents and find the meaning of different arguments and terms. Stated from the Mayring (2014), in content analysis four main steps need to be followed for qualitative model. These are material collection, descriptive analysis, category selection and material evaluation (Mayring, 2014; 2029). We combined both approaches in our analysis and come up with the following table and model. For simplicity, we removed details of articles content and we took elements and outcomes for building our CEps model.

**Table for Content Analysis: Circular Entrepreneurship's Elements and Outcomes**

<b>Authors</b>	<b>Elements</b>	<b>Outcomes/Findings</b>
Nußholz, 2018; Brown et al., 2021; Fidan et al., 2021; Huynh, P.H., 2022; Geissodoerfer et al., 2022, Straub et al., 2023, Bocken et al., 2018, Kanda et al., 2021; Mehrotra and Jaladi 2022; Upadhyay et al., 2019; Bigliardi and Filippelli, 2021; Leone et al., 2023; Puglieri et al., 2022; Henry et al., 2020; Guldmann and Huulgaard, 2020; Konietzko, 2020; De Angelis and Feola, 2022; Daño et al., 2020; Donner et al., 2021; Hoffmann, et al., 2020; Sumter, et al., 2018	CBM, BM and Life cycle assessment,	<ul style="list-style-type: none"> <li>• Reduction in environmental effects,</li> <li>• Environmental and economic performance;</li> <li>• Diminish complication and order potential interferences for entrenching circularity in the BM;</li> <li>• Circular oriented innovation and implementation of CBM,</li> <li>• CBM and digital innovation uses for less resource consumption, lower waste emissions and a more stable economy;</li> <li>• CBM to transition to CE through skills taxonomy;</li> <li>• CBM experimentation to transition to sustainability;</li> <li>• BM experimentation in lean start-up;</li> <li>• CBM and ecosystem to support innovation and value chain integration;</li> <li>• CBM for achieving positive social behavioral change;</li> </ul>
Suchek et al., 2022; Findik et al., 2023; Alonso et al.,	EU and CE implementation,	<ul style="list-style-type: none"> <li>• Circular entrepreneurship and rising circular SMEs in EU countries:</li> </ul>

<p>2021; Rosado and Kalmykova, 2019; Ferreira et al., 2019; Brown et al., 2021; Del Vecchio et al., 2021; Kostakis and Tsagarakis, 2022; Demirel and Danisman, 2019;</p>	<p>EU actions plan, policies.</p>	<ul style="list-style-type: none"> <li>• Resource efficiency, productivity through CE;</li> <li>• Policies and management that advance the circular economy, urban sustainability;</li> <li>• Effect of I 4.0, digital transition for green transformation in SMEs in EU;</li> <li>• Policies and institutional entrepreneurship as enablers to transition into CE in EU;</li> <li>• Development of motivation, leaderships and other soft skills for circular economy <b>eco-system</b> in EU;</li> <li>• Higher human development in circularity if EU provides opportunities;</li> <li>• SMEs engagement in CE <b>eco-innovation</b> in EU region and investment required for that.</li> </ul>
<p>Fonseca et al., 2018; De Angelis et al., 2018; Barbaritano et al., 2019; Kayikci et al., 2023; Shafiee et al., 2023; Le T., 2022; Hidalgo-Carvajal, et al., 2023; Rosado, and Kalmykova, 2019; De Angelis, et al., 2018; Farooque, 2019.</p>	<p>Circular supply chain management (CSC) or supply chain collaborations or sustainable supply chain.</p>	<ul style="list-style-type: none"> <li>• Procurement and circular supply chain management (CSCM) to solve environmental issues,</li> <li>• Biodegradable packaging; transformation of sustainable business implementation of innovative business models,</li> <li>• Circular supply chain collaboration and coordination,</li> </ul>

Henry et al., 2020; Fidan et al., 2021; Zhou and Park 2021; Prosman and Cagliano, 2022; Berghuis et al., 2023, Rok and Kulik 2021.	Circular startup/startup,	<ul style="list-style-type: none"> <li>• Environmental startup, innovative organization to solve social problems,</li> <li>• Sharing economy industry, using circular business models in start-up development,</li> <li>• Circular start-up archetypes: design-based, waste-based, platform-based, service-based and nature-based start-ups</li> </ul>
Beck, et al., 2023; Kahupi et al., 2021; Hull et al, 2021; Staicu and Pop, 2018; Zhu et al., 2019; Tura et al., 2019; Flygansvær et al. 2019;	Government assistance, Stakeholders support	<ul style="list-style-type: none"> <li>• Stakeholders value creation (SVC) contributes to most SDGs in cities,</li> <li>• Circular operation, smart sustainable cities, and innovation ecosystems</li> <li>• Entrepreneurs to pursue circular-economy opportunities with a limited role for government,</li> <li>• Isolation and preventing collaboration among stakeholders</li> </ul>
Bjelobaba et al., 2022; Hull et al., 2021; Gatto and Re, 2021; Manshoven and Gillabel, 2021;	Education and knowledge on CE	<ul style="list-style-type: none"> <li>• Blockchain technologies and sustainability in education,</li> <li>• Entrepreneurship is a core procedure to forward-thinking knowledge and sustainable innovation in CE.</li> </ul>
Khan et al., 2023; Baars et al., 2021; Duberg et al., 2020; Carraresi and Bröring,	Technology and Technological innovation	<ul style="list-style-type: none"> <li>• Technology for creating ecosystem;</li> <li>• Digital innovation and CE;</li> <li>• Technology-driven substitution,</li> </ul>

<p>2021; Huynh P.H., 2022; Saura et al., 2022; Elf et al., 2022; Mondal et al., 2023; Ilić et al., 2022; Dentchev et al. 2018; Worthington and Downey, 2019; Del Vecchio et al., 2021;</p>		<ul style="list-style-type: none"> <li>• Remanufacturing process and technology catalyzing, technology implementation;</li> <li>• Technology for sustainable innovation;</li> <li>• Technology-based approach for sustainable BM,</li> <li>• Technology and technical knowledge for entrepreneurship, circular entrepreneurship,</li> <li>• Technology entrepreneurship and entrepreneurship education for digital transformation;</li> <li>• Digital arrangement to boost circular entrepreneurship and SMEs,</li> <li>• Technology and CBM, “technology-based enablers” blockchain technologies and societal transformation</li> </ul>
<p>Sameer et al., 2023; Staicu, 2021; Beck et al., 2023; Le T.T., 2022; Todeschini et al., 2017; Staicu, 2021; Närvänen et al., 2021;</p>	<p>Corporate social responsibility (CSR)</p>	<ul style="list-style-type: none"> <li>• CSR, sustainability, and CE research for development;</li> <li>• Green CSR and human entrepreneurship for achieving SDGs</li> <li>• CE, sharing economy, CSR, entrepreneurship for social change</li> <li>• Social bricolage, knowledge sharing, open innovation, ethics, and creativity</li> </ul>

Pialot et al., 2017, Pieroni et al., 2019; Evrard et al., 2021; Fleischmann, 2018; Han et al., 2020;	Product service system (PSS), Servitisation, service design,	<ul style="list-style-type: none"> <li>• Circular economy-oriented service:</li> <li>• Transitions in designing immortal products,</li> <li>• Service design for better quality of life;</li> <li>• Upgraded product-service design for environmental gain,</li> <li>• Product-service system for economic growth and resource decoupling.</li> </ul>
Rasado and Kalmykova, 2019; Donner et al., 2021; Demirel and Danisman, 2019;	Industrial symbiosis (IS), R&D,	<ul style="list-style-type: none"> <li>• Industrial symbiosis and combining economic activities,</li> <li>• IS for stakeholders' collaboration,</li> <li>• IS for opportunities for resource exchange, and sharing of infrastructure;</li> <li>• IS for economic growth, SME engagement, and firm growth.</li> </ul>

## 2.6 CEps Antecedence

We propose three levels of analysis as our antecedents which is the most consistent and popular framework to examine the concept of CE and hence CEps (Nikolaou and Tsagarakis, 2021). Based on the existing literature, the three levels of analysis are; micro level, meso level, and macro level. In micro level, CEps deals with firm level practices to adapt with CE principles in its productions, operations and strategic management activities (Nikolaou and Tsagarakis, 2021). To adopt CE principles, the firm hence, CEps accepts CBM, recycle, reuse, end of life product, redesign of products, circular labels, circular products, and recovery of

materials (Nikolaou and Tsagarakis, 2021). Similarly, Saidani et al. (2019) stated that micro level considers product, companies, consumers factors, meso-level which considers eco-industrial parks and macro level that considers city, region, national and international level (Saidani et al., 2019). These three levels encompass with many other factors and link each other to support sustainable development ensuring economic, social and environmental performance (Saidani et al., 2019). However, Simone and Alberg (2020) provided micro level indicators such as recycling, remanufacturing, reuse, traditional resource-efficiency, disassembly, lifetime extension, different waste management strategies, end-of-life, and multi-dimensional. They further stated that micro-level indicators work like enablers that are essential for CE implementation (Simone and Alberg, 2020). Nonetheless, to implement firm's level practices of CE, CEps must consider broader perspectives of micro level variables which authors provided in discussion.

The 2<sup>nd</sup> level (meso-level), deals with collaboration among firms, suppliers and stakeholders that facilitates the interchange of circular materials (waste materials) (Nikolaou and Tsagarakis, 2021). In addition, meso-level initiative indicates inter-firm level or cross-sector level collaboration such as eco-industrial parks where firms share resources among themselves more efficiently (Assemblali and Sabar, 2024). To implement and adjust with meso-level, firms hence CEps must adopt some concepts such as industrial symbiosis, industrial ecology (Nikolaou and Tsagarakis, 2021). The final level CE initiative is called macro-level initiative where policy makers and government work together (Assemblali and Sabar, 2024). For example, in 2020 European Commission had taken an action plan that called EU CE Package which is considered as an macro-level initiative (Assemblali and Sabar, 2024). where EU directive stated that by 31 December 2025, 65% of the weight of all packaging waste must be recycled (EU directive, 2020).

The current framework of CEps is not only identifying the antecedences, elements and outcomes of CEps but also provides guidelines of value-creation, risk taking and creating business through CEps process. CEs would like to change the BM and move towards value creation considering ecological and social values rather than stick with liner value-centric business model (Re and Magnani, 2022). Risk taking is a major function in entrepreneurship and in case of sustainability and CEps perspective three types of risk CEps may encounter such as innovation risk, governance risk and stakeholder relationships management risk (Gennari and Cassano, 2020). In case of governance related risk, the top level executives or board must have the capability to formulate CE strategies with responsibility and accountability otherwise transition to CEps would be impediment (Gennari and Cassano, 2020).

Transition to CEps involves many critical issues and brings numerous corporate risks. For example, to be competitive in the global market in the new circular reality, corporate business must adjust with the sustainability issues and build capabilities to manage risks in doing so (Gennari and Cassano, 2020).

## 2.7 Circular entrepreneurship antecedents

There is a wide range of debate regarding antecedents of entrepreneurship. Ardichivili et al. (2003), identified antecedents of entrepreneurial alertness are entrepreneur's prior knowledge, social networks and personality traits. On the other hand, Devece et al. (2016) divided entrepreneurial antecedents as internal and environmental. Environmental factors are external conditions or push factors such as unemployment that motivate people to become entrepreneurs (Devece et al., 2016). However, we consider CE is an external condition that will induce new type of entrepreneurship and called it circular entrepreneurship (CEps). Sommer and Haug (2011) identified that international knowledge is an antecedent to growth strategy for

entrepreneurship whereas knowledge in general considered as an entrepreneurial resource and plays an important role in entrepreneurship. Other study found that institutionalization of norms, perceived lack of marketable skills are antecedents of entrepreneurs (Sharma, and Irving, 2005).

While understanding to new entrepreneurship, Urbano, et al., (2012), identified that higher education is an important antecedent of entrepreneurship among students. While investigating entrepreneurial behavior among managers, Ireland et al. (2009) identified organizational antecedents as management support, work discretion/autonomy, rewards/reinforcement, time availability organizational boundaries (Ireland et al., 2009). There are many studies that support the notion that antecedents affect entrepreneurship directly and also improve company's performance (Jennings and Kuratko, 1999). A great deal of factors regarding antecedents identified by Jennings and Kuratko (1999), such as proactiveness, **risk taking**, innovation, intrapreneurship, internal alliances, administrative, venture capital, competitive approach, alliances, incubative ventures, initiative venturing, acquisitive venturing, opportunistic, management support, resource availability, organizational structure and environment.

Synthesizing all those studies relevant to antecedents, we identified specific antecedents for CEps which are discussed below:

### 2.7.1 Micro Environment for CEps

Micro variables are the antecedents and these variables are closely related with business and most of the variables are controllable. For instance, firm's mission, vision, risk taking, strategy, resources, competences, processes, leaderships, behavior are also included in micro level variables.

### *2.7.1.1 Mission and Vision*

Although most of the studies emphasized on BM in transition to CE, very few studies talk about company's mission and vision that shape the CEps. In case of product-service system (PSS), the BM has to be new and ask questions regarding company's vision to fit in the market for long run (Pialot et al., 2017). The mission and vision of CEps must be redefined to adopt the CE strategies and to move a transition from linear production system to circular production system.

### *2.7.1.2 Risk Taking*

This is universal that entrepreneurs are risks takers but without inclination of taking risks entrepreneurs can't start a new business. In case of sustainable entrepreneurship, Hoogendoorn et al. (2019) identified a different type of risk and attitude that is uncommon to the regular entrepreneurs. Similarly, in CEps the entrepreneurial eco-system is different so that the perceived barriers and nature of risks are also be different. Although risks attitude are similar in traditional and sustainable entrepreneurs but the later is more worried in personal failure (Hoogendoorn et al., 2019). Different categories of entrepreneurs are said to confront different types of risks, according to studies (Block et al. 2015; Shaw and Carter 2007). Shaw and Carter (2007), for instance, contend that social entrepreneurs are concerned about non-financial personal risks such as the possibility of losing their network of personal connections or local legitimacy (Hoogendoorn et al., 2019). Sometimes, risks can emerge from intellectual property, copy right, legal and privacy and to mitigate these risks Turban et al. (2011) suggested to develop education, government policy, control and monitoring. CEps also may face these

intellectual properties and copy rights issues if new technological know-how inoculating in CE.

### *2.7.1.3 Entrepreneurial Opportunities*

Entrepreneurs always look for opportunities and they create value looking at any changes in the society and try to solve the problems by developing BM. CEs are also looking opportunities from environmental changes and they exploit opportunities that created by environmental degradation. However, sometimes some social entrepreneurs miss important opportunities as they treat themselves as social activists rather, they ignore resource utilization that involve financial resources to solve the problems (Hockerts et al., 2010). Researchers (Dean and McMullen, 2005) showed that entrepreneurs solve environmental related market failure by capturing opportunities and by creating sustainable BM so as to change the public perception (Hockerts et al., 2010). Some researchers link entrepreneurial alertness (individual ability to see the chance) with the persuasion of new opportunities and they identify ingredients of alertness such as environmental scanning, connection, evaluation and judgement (Tang et al., 2012). According to Ardichvili et al. (2003) there are five phases for recognizing and identifying entrepreneurial opportunities such as i) entrepreneurial alertness ii) prior knowledge and information gathering iii) social connections iv) personal traits such as self-efficacy, creativity v) type of opportunity (Crecente et al., 2021).

### *2.7.1.4 Entrepreneurial Initiative*

Risks taking and initiative go hand-in-hand in entrepreneurship. In CEps, the initiatives are different than the traditional entrepreneurship. For example, in CEps initiative are related to pollution control and technological innovation ( Sehnem et al., 2023), initiatives to prevent and

support environmental pollution ( Sehnem, et al., 2023), initiative to sustainable development and product management ( Sehnem et al., 2023). While investigating initiatives in construction and building recycling, Karstensen et al. (2019) found that there is waste recycling initiative for building new building products from construction waste. Similarly, many sectors are coming forward in waste recycling initiative and making new product which is part of CEps initiatives. There are born entrepreneurs motivated by waste management and they become CEps by taking initiative of waste recycling. Mahringer and Renzl (2018), identified micro-foundation of dynamic capabilities and argue that entrepreneurial initiative is one of the important micro-foundations for dynamic capabilities while addressing the environmental issues. They also showed that environmental dynamism plays important role in case of entrepreneurial initiatives, operative routines and dynamic capabilities. Further, their model suggest that entrepreneurs fit in dynamic environment because entrepreneurs' initiatives dislocate operative practices and capabilities. As the dynamic capabilities focus a match between organizational routines and external environment (Mahringer and Renzl, 2018), so that CEps fit in the process with entrepreneurial initiatives.

#### *2.7.1.5 Strategy*

Circular strategies depend how company or CEps can create lucrative offers by creating values and lowering capital costs (Nußholz, 2018). But implementing circular strategies need a holistic view and radical changes of company's value chain and offerings (Nußholz, 2018). In this perspective, BM innovation plays an important role and works as an enabler to capitalize circular strategies (Bocken et al., 2016).

In case of upgradable PSS business model, manufacturers revamp the customer relationships and employ strategy to provide support services without transferring ownership of the product

(Pialot et al., 2017). According to Pialot et al.(2017), eco-learning strategy and eco-scorecard/passport are essential to gain legitimacy in environmental performance. They further stated that eco-learning strategy aims to encourage consumers to use eco-friendly product for restoring environment (Pialot et al., 2017). This element of antecedent shapes the CEps goals and objectives and align with the organizational capabilities to reach its goals.

#### *2.7.1.6 Behaviour*

Although there is wide awareness regarding environmental issues among the firms but there are little empirical studies regarding firm's behavior to adopt CE (Liu, Y., and Bai, Y., 2014). China is leading example of adopting CE concepts. Despite good understanding of CE, in their empirical study among 157 Chinese firms, Liu and Bai (2014) found that actual behaviour of implementing CE and willingness to operate a CE has a gap. Firms are not implementing CE although they have good understanding of it. Developing a circular culture for CEps, behaviour must be changed and must think circularity in every aspects of the organizational activities.

#### *2.7.1.7 Leadership*

Entrepreneurs act like a leader in his or her business but sometimes they may fail to spot valuable opportunities because of market knowledge (Millette et al., 2020). In the same way, their leadership may focus on specific information types because they create a bounded rationality on that particular information sources and miss opportunities that create new economic dimension like CE (Millette et al., 2020). CEps act like a leader and always recognize opportunities and pursue those opportunities that created within CE domain. So, leadership specially, from CEps or top management is very important driver to implement CE and sustainable operational practices (Moktadir et al., 2018). According to Moktadir et al. (2018),

the bold drive of top management or CEps as a leader and collaboration between organizations are required for achieving a sustainable manufacturing practices. They further stated that for ensuring economic benefit, leadership and commitment of top management are equally important. However, unlike new firms, established firms must recognize leadership challenges to secure governance of BM experimentation and good leadership ultimately help to implement BM within the organization (Bocken et al., 2017). In framing CEps, CE brings challenges to existing organizational leadership and for being sustainable leaders, entrepreneurs must focus sustainable goals of the organization and avoid focusing on only recycling products (Bocken et al., 2017).

#### *2.7.1.8 Knowledge and Expertise*

CEps must be knowledgeable to adopt CE principles in their organization. Rapid changing of technology and making innovative products for CE must need technical knowledge. Sometimes entrepreneurs lack knowledge and expertise in case of complex equipment and fail to contribute in product design or to remanufacture and repair products (Veleva and Bodkin, 2018). According to Allee (2000), for getting viable BM there are some key enablers such as long-term relationship between entrepreneurs and corporations, knowledge and expertise in IT (including supply chain, product and customer needs and expectations). He further confirms that for introducing a new BM leveraging value of knowledge and intangible benefits is important (Allee, 2000). On the other hand, getting profit by converting waste materials into resources is a complex and multi-dimensional problem that requires knowledge of the materials, market, technologies and socio-economic trend (Donner et al., 2021). Although there are numerous articles and studies on CE researches, new BMs, product designs, innovative technologies, but still there is little knowledge on transformative capability of CE (Zwiers et al., 2020). Zwiers et al. (2020) identified three types of knowledge that are important for CE, such as “i) system knowledge; ability to understand complex system, ii) target knowledge;

formulate goals pertinent to sustainability iii) transformation knowledge: practical know-how in case of production and consumption.” As we are living in a knowledge society, so the fundamental of everything (for instance; politics, economics, culture) is knowledge (Zwiers et al., 2020). Hence, knowledge is the key to transform existing linear economy to CE because knowledge helps to understand the practices and shapes implications (Zwiers et al., 2020). In the new reality of CE, as an antecedent, CEps need technical knowledge and proper training and development program must be introduced to minimized the knowledge gap that prevailing now.

## 2.7.2 Meso Environment for CEps

Meso environment includes suppliers, distribution networks/supply chain networks, strategic partners, market forces.

### *2.7.2.1 Suppliers and Supply Chain Network and Management*

CEps must closely work with suppliers and they must have a strong supply chain networks with other entrepreneurs and network partners. Within the domain of CE, there are numerous types of entrepreneurial activities emerging day-by-day. One of the trend is emergence of “circular support entrepreneurship (CSE)”. They are the entrepreneurs who own small business and supply wastage and recyclable products to the big corporation for further process and for making goods or services. Despite the proliferation of circular support entrepreneurs (CSEs), literature and research on these networks entrepreneurs are very limited. Both CSEs and CEps needed for transition to CE because both are complements to each other. CSEs work under the direction of CEps and both create a network of supply chain to adopt new BM. CSEs can

leverage new BM and support business processes of CEps in collecting, sharing, repairing, manufacturing, designing product and services which requires a good supply chain management (SCM) (Fonseca et al., 2018). Although the concept of SCM is not new but when it integrates the CE concepts and practices, then we find very few researches have been done on it (Farooque et al., 2019). According to Farooque et al. (2019), “Circular supply chain management (CSCM) is the integration of circular thinking into the management of the supply chain and its surrounding industrial and natural ecosystems” with the goal of achieving “zero wastes”. CEps integrates CSCM and align other functions of the organizations for smooth operations and management within CE. The supply chain networks and its characteristics are a bit different than traditional supply chain in terms of raw materials and its sources, because unlike CSCM, linear supply chain excerpts resources from the geosphere and the biosphere (Farooque et al., 2019). CEps also helps revamping the network distribution channels and facilitates other ancillary functions of the organization considering CE principles in doing business.

#### *2.7.2.2 Partners and Strategic Partners*

CEps needs partners and strategic partners to be able to imbue other operational activities align with CSCM. These sorts of partnerships are important for value creation and development of circular business models (CBMs) despite their little past experiences on CBMs creation (Guldmann and Huulgaard, 2020). Although building CBMs for new types of partnership is important but encompassing new partners and establishing trust with them is a challenge for some organizations (Guldmann and Huulgaard, 2020). In addition, in case of collaborative partnership some sorts of formal agreement may needed, however, initially this formal industry standard agreement offset by building trust and collaboration with new partners (Guldmann and Huulgaard, 2020). Contrary to big companies, smaller companies sometimes skeptical

regarding extending external partnerships at the beginning because of new CBMs that brought by CE and they are not sure the business direction in new a reality (Guldmann and Huulgaard, 2020). Understanding the fact of new opportunities in CE, CEps shape their strategies and extend their collaboration by making strategic partnership with other companies.

### *2.7.2.3 Market and Market Forces*

Market and market forces are both facilitators and barriers to the CEps. Regulations in the market, for instance, taxation and labor laws sometimes create obstacles for new product development and may increase the production cost on recycle, repair, and remanufacturing activities (Guldmann and Huulgaard, 2020). Market structure, unclear market demand, customer acceptance in the market, low price of virgin raw materials in the market affect the CEps to change the strategies (Guldmann and Huulgaard, 2020). Moreover, having timely access to market information is vital in adjusting production plans specially in agricultural sectors for mitigating the risks and uncertainty (Zhu et al., 2019). The juxtaposition of developed and developing market scenario poses that market-driven entrepreneurs in developed world bring sustainable innovation in the market whereas in developing economies, government are considered as the key driver of CE oriented market forces (Zhu et al., 2019). Of course government should develop a market model to promote CE at the same time executing market regulations, however, entrepreneurial development or CEps should be the cornerstone of that market model (Zhu et al., 2019).

## 2.7.3 Macro Environment for CEps

### 2.7.3.1 Economic Growth and Uncertainties

According to MacArthur Foundation (2015), entrepreneurial activity and economic development is generally linear in characteristics where resources are extracted and used from the nature. Contrary to linear economy, CE adopts sustainability concept and provides entrepreneurial opportunities and recognizing waste as a valuable resource (Millette et al., 2020). Long-term economic growth and sustainability can be ensured by decoupling environmental impact that caused by increasing resource consumption (Millette et al., 2020). CE can provide macroeconomic benefits by building strong infrastructure and promote sustainable industrialization (Geissdoerfer et al., 2017). By generating revenues from waste, CEps can reduce a country's dependency on foreign aid which is a major problem of under developed and developing economies (Millette et al., 2020). Hence, entrepreneurs or CEps can yield benefit of CE opportunities through reducing production cost and supporting better performance of the economy (Millette et al., 2020).

### 2.7.3.2 Social Factors

Ecofriendly behavior depends on individual's attitudes, beliefs, and socio-cultural norms (Carmi et al., 2015). As CE brought a lot of new concepts that may be seen socially responsible activity in one hand, but on the other hand, it may be considered as a disruption of existing social systems although it provides economic benefit (Millette et al., 2020). Along with economic benefit, to get social and environmental benefit, there is no single approach in the convergent process of sustainable entrepreneurship (Millette et al., 2020). CEps as a dimension of sustainable entrepreneurship, faces social and ecological challenges and pass through

multiple phases on convergent process by articulating potential opportunity in CE (Millette et al., 2020). Strategies such as resource life-extending in new BM or sustainable BM which creates social and environmental value not yet explored to date (Bocken et al., 2017). However, there is a positive relationship and a ‘win-win-win’ situation exist among social, environmental and macroeconomic variables in transitioning to CE (Dias et al., 2021). CEps can moderate this relationships and can grasp the opportunities that created in this socio-structural transition.

### 2.7.3.3 Environmental Factors

The concept of bio-economy and circular economy getting popular in the early 1970s and 1990s (Gregorio et al., 2018) because of growing demand of innovative products that have low environmental effects. Hence, organizations must consider economic, social and environmental issues to be sustainable in business and to develop a sustainable BM. Until now, very few BM emerged that consider environment and social issues in their mission or in other words, a few BMs are environmentally and socially integrated (Staicu, 2021). This gap creates opportunities for CEps and CEps develops new BM to adjust with the transition towards CE. This transition proposes an opportunity to diminish Europe’s environmental footprint by reducing consumption of virgin raw materials and decreasing the generation of waste materials (Staicu, 2021). European Union (EU) emphasizes a climate-neutral model through reducing the environmental pressure, ensuring resource efficiency and using renewable raw materials and moving towards a CE (Gatto and Re, 2021). Moreover, in EU positive policy regarding financial measures help the transition from linear to CE and brought huge industrial opportunities both for big corporations and for small and medium enterprises (SMEs)(Gatto and Re, 2021). CEps grasp these opportunities for sustainable business performance and for ensuring a BM that ensures environmental issues.

## 2.8 Circular Entrepreneurship Elements

### 2.8.1 Business model (BM)

Business model (BM) occupies most of the CE research areas and has very profound impact on CE and CEps research. Transition from linear economy into CE, BM considered as a key enabler and guide the economy and business to its transition (Henry et al., 2020). Generally, CBM integrates CE and CEps concepts and principles that aims closing materials loops so as to keeping resources usable as much as possible through reusing, recycling, recovering or regenerating the products (Kirchherr et al., 2017; Linder and Williander, 2017; Henry et al., 2020). There are three major elements that are important for a sustainable BM such as value proposition, value creation with value delivery and value capture (Bocken et al., 2014). Value proposition indicates the available offer that the organization provide to its target customers. On the other hand, value creation and delivery means the activities that creates value, the resources for value creation and also indicates value related partners and distribution channels. However, the value capture integrates the organizational structures and the revenue models (Henry et al., 2020). By creating, delivering and capturing economic value, we can ensure social and environmental sustainability at the same time (Henry et al., 2020). CE brings new thoughts in creating value as the traditional production methods (creating and delivering value) are no longer considered in CE. Moreover, capturing value needs a transformation that requires a holistic change within the organization. So, the current BM model needs to be revamped and reshaped to adapt with CE. Our model provides an insights in BM considering the needs of CE. We consider BM as an element that contributes to the sustainability and CE. CEps utilizes CBM for designing and delivering product and services that are regenerative and restorative in nature.

As the BM is the most important elements in the transition from linear economy to CE, CEps uses these new types of BM for CE adoption process.

### 2.8.2 Life Cycle

LCA is a tool to reduce environmental degradation and hence contributes climate change by making product's life cycle longer throughout the lifetime of a product. According to ISO 2006a, it is a scientific method with ISO 14040 that helps the development process of the product by identifying hot spots during the product's life cycle (Fidan et al., 2021). CEps develops new product design that help's prolong life cycle and hence add values to the product that are environmentally friendly.

### 2.8.3 New Business, Startup

In CE and CEps perspective, startups can be seen from remanufacturing to circular supply chains network. A start-up to remanufacturing process is possible when there are individuals commitment to a remanufacturing project that influence the surrounding links in the supply chain ( Duberg et al., 2020). On the other hand, circular supply chains can be developed from startups because they offer better product and services from local businesses and they also closely work with large incumbent firms (De Angelis et al., 2018). Some global organizations have good negotiation power in contracts that allow them to reach local startups for facilitating the dispersion of circular services like catering services (Greer et al., 2020). Greer et al. (2020) stated that in case of Dutch startup in catering services, the financial accessibility of innovative funding and entrepreneurial grants important for innovative diffusion and sustainable growth of startups. They further stated that innovative startups must be prepared for proper BM or product-service model for solving customer needs in an innovative way (Greer et al., 2020). Circular startups are available in different sectors of economy, not only remanufacturing and catering sectors. For example, now-a-days lots of startups can be seen in car-sharing business or other sharing markets that contribute circular entrepreneurship and circular innovation. For

instance, new ventures and new startups are playing a major role in improving regional economic growth, employment in China (Zhou and Park, 2021). According to Zhou and Park (2021), this new BM of sharing economy is growing fast and Chinese government is promoting this new BM for economic development. They further mentioned that this new car-sharing business also contributing sustainable development for reuse and circular economy.

Although most of the articles don't mention circular startup as the concept is new and synonymous to new business, but we recommend that this should be termed as "Circular Startup" that is a part of CEps model. These sorts of startup dedicated their business in CE and contributing in climate change adaptation and mitigation which also create opportunities for CEps.

#### 2.8.4 Circular Supply Chain (CSC) or Supply Chain

Supply chain is always an important issue in CE and scholars in this field termed it "Circular Supply Chain (CSC)" which requires a major transition from linear supply chain to circular supply chain through supply chain ecosystem and circular innovation (Zanella et al., 2014; Farooque and Zhang, 2017; Batista et al., 2018). All raw materials and parts of products are linked to its sourcing and production system and also linked to its supply chain (Kumble, 2019). In CSC, circular entrepreneurs use waste materials for further process and use to remanufacture of products. CSC connects raw materials suppliers, end users, and service suppliers and need to redesign products to adjust with CSC networks. For instance, in building sector, in closing and slowing materials loops, it is necessary to redesign supply chain by involving all stakeholders from raw materials suppliers to end users (Leising et al., 2018). For creating closed loop supply chain, Bocken et al. (2017) argued that supply chain partners need social relationship and collaboration. Leising et al (2018) defined supply chain in CE as a network of connecting actors by exchanging data and materials flows. However, in case of bioenergy

sector, optimal location of the power plant is important because it provides economic and environmental sustainability in biomass sector through supply chain (Palmieri et al., 2020).

In a study, Palmieri et al. (2020) found that short energy supply chain requires less steps than large power plant which requires long distances to transport fuels and needs more intermediate steps at the same time. In another study, it is found that to build a responsible supply chain in CE, it is necessary to provide education to business partners, suppliers specially start-up perspectives (Rok and Kulik, 2021). According to FAO (2015), about 30% of the global energy production consumed by food production and food supply chain. This means we need to implement CE and CSC to reduce this huge consumption of energy to protect our planet. Most importantly, Business Model Innovation (BMI) and structural changes needed in supply chain management to adopt new and innovative technologies and to transform business strategies that address CSC (Carraresi and Bröring, 2021). As an element of CEps framework, CEps utilize CSC to adopt CE and to avail opportunities that created by CE.

#### 2.8.5 R-Strategies: Reduce, reuse, and recycle, upcycling, regenerate, remanufacturing, refurbish, resource efficiency

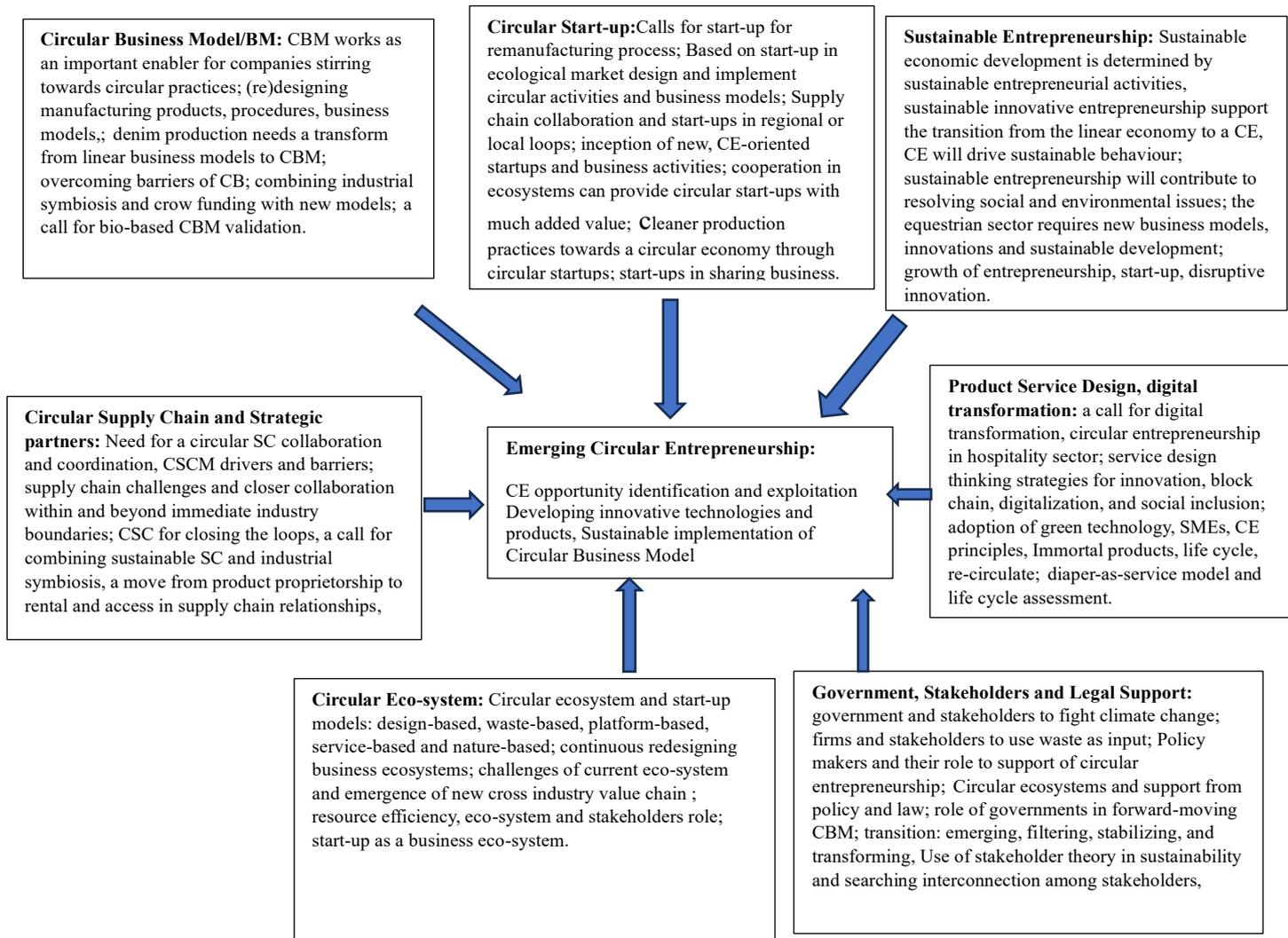
In CEps, R-strategies (reduce, recycle, reuse and so on) are important as these strategies save our natural resources. Transition to CEps calls for these strategies and CE business model does not mean only recycling waste materials it does cover all R-strategies (Fonseca et al., 2018). For example, CE base BM covers diminution of raw materials consumption, reusable eco-design and environmentally friendly product, longer life cycled product, recoverable products ingredients from waste product (Fonseca et al., 2018). The R-strategies indicate some options of product use and reuse as follows (Adopted from Fonseca et al., 2018):

“(1) Refuse: preventing the use of raw materials; (2) Reduce: reducing the use of raw materials; (3) Reuse: product reuse (second-hand, sharing of products); (4) Repair: maintenance and repair; (5) Refurbish: refurbishing a product; (6) Remanufacture: creating new products from

(parts of) old products; (7) Repurpose: product reuse for a different purpose; (8) Recycle: processing and reuse of materials; and (9) Recover energy: incineration of residual flows.” For sustainable production and consumption, CEps need to consider upcycling where used products/materials are transformed into a higher quality product. This upcycling will ensure resource efficiency and increase product life cycle. Resource efficiency through “prolonged product life” and “closing the life cycle” are important principles in CE (Ferreira et al., 2019). In manufacturing industries such as paper industries resource efficiency calculated by measuring resource utilization and its impact in environment (Ferreira et al., 2019). Some companies (power manufacturing) calculate eco-efficiency which represents a ratio of product or service value against its environmental impact (Palmieri et al., 2020). CEps must consider R-strategies in its operation management and product design.

#### 2.8.6 Management and HRM Structure, Organizational Structure, HRM Support

In case of CE, stakeholders such as human resource management (HRM) holds a strong position with other CE related stakeholders such as market, legal identity, technology and customer typology (Staicu, 2021). Without support from HRM, it would be difficult to implement CE principles within the organization. HRM is responsible for training and development of employees and CE needs training of CE concepts and develop a circular culture within the organization. Alongside, reverse logistics system with inter-organizational structure supported by HRM can produce better service and delivery costs (Flygansvær et al., 2008). In SMEs, CEps determine the HRM structure and redesign its organizational structure to cope with the new reality and adopt the strategies that fit its HRM structure.



**Figure 5: Development of Circular Entrepreneurship (Authors Findings)**

## 2.9 Circular Entrepreneurship Performance Outcomes

### 2.9.1 Economic, Social and Environmental Performance and Achieving Sustainability through CEps

Scholars are now considering CE related BM as the best model for economic and social wellbeing (Ilić et al., 2022). Not only scholars but also international organizations such as the United Nations (UN) and Organization for Economic Cooperation and Development (OECD) consider CE as a means to shift society towards an economically-efficient social system which will ensure sustainability by solving ecological challenges (Ilić et al., 2022). There is no doubt that CE can solve sustainability issues i.e., economic, social and environmental issues, however, the scholars and international organizations are barely talk about the role of CEps which can be a means to solve and boost the economic, social and environmental performance. Our proposed model clearly indicates that the ultimate output of CEps is to solve sustainability issues through the proper implementations of identified elements of CEps and considering CEps antecedents. Creating favourable entrepreneurial environment and investing on CEps's elements are the keys to succeed in sustainability issues. The model also support entrepreneurial ecosystem concept and CEps support innovation through circular ecosystem that has root from industrial ecology (Kanda et al., 2021).

Although emerging literature on entrepreneurship for sustainable development and other sustainability entrepreneurship literature indicate some common additional features such as: (i) discussion on opportunities and challenges for entrepreneurs in markets (Johnson and Schaltegger, 2020) (ii) value-creation for society to address climate change (Muñoz and Cohen, 2017) (iii) adjusting market fiascos to support environmental dilapidation (Dean and McMullen, 2007), however, the literature also failed to provide a complete model that support to sustainability issues. In this case, we strongly believe that our model provides direction to solve these problems in a holistic way. Johnson and Schaltegger (2020) found a causal

relationship among micro, meso and macro-level variables that is important to a positive transformation to CE or SD, however, we put CEps or entrepreneurial efforts to interplay and to work as a means in this transformation process for accelerating the social, economic and environmental performance. Through CEps we can achieve resource efficiency for ensuring better **economic performance**.

According to United Nation (2014), the urban population in cities will be 2.5 billion and thus these increased population will create pressure on natural resources (Rosado and Kalmykova, 2019). As a result, the world will face scarcity of resources and cause more environmental degradation. CE through CEps can solve this massive challenge by ensuring resource efficiency at the same time balancing economic growth (Rosado and Kalmykova, 2019). Moreover, it is estimated that adopting CE can increase resource productivity by 30%, can increase gross domestic product (GDP) by 1%, and can increase 2 million jobs (Affarirs F., 2014).

In CE, resource efficiency through value creation, value capture and value delivery are very important to be a BM effective. Value creation from waste materials and getting resource efficiency is central to CBM by understanding the value proposition that the company offers to the customers (Richardson & Richardson, 2008). Bocken et al. (2013) investigated how the value missed, destroyed, wasted (created resource inefficiency), and uncaptured and saw how these value changes create opportunities for stakeholders and also how these changes to contribute in making innovative business models (Brown et al., 2021). Many organizations are trying to reduce resource use by sharing resources, using wastes as secondary raw materials, and producing eco-innovative products by integrating industrial symbiosis and sustainable SCM (Rosado and Kalmykova, 2019).

In case of **social** outcomes in CE and sustainability, Sudusinghe and Seuring (2022) found that health and safety concern link with four social outcomes such as i) social compliance, ii) training

and education iii) human rights iv) anti-corruption and human resources. Of course, environmental issue is always a matter of social compliance and CEps design products and services in considering social compliance. Transforming linear economy to circular economy through CEps, training and education in all entrepreneurial levels are important and human resource development in CEps will facilitate this transition process. Having clean environment and access to a healthy life style is a human right issue which can be assured through implementation of CEps to achieve sustainable goal.

In addition to social outcomes, **environmental outcomes** consists of carbon emissions, energy efficiency, land use, waste management, water management are burning issues (Sudusinghe and Seuring. 2022). CEps is the key driver to stop carbon emissions through product development by ensuring regenerative and recyclability of products and service systems. There is an interlink among environmental outcomes and researches on water management also link with energy-efficiency and emissions (Sudusinghe and Seuring. 2022). As the landfill is a major concern for waste management, so proper land use can be assured through CEps. Furthermore, the objective of CE is to reduce resource and energy consumption, so implementation of CEps model is necessary as soon as possible as the CEps facilitate these resource conservations. Scheepens et al. (2016) argued that entrepreneurs or innovators are the main stakeholders creating supportive environment for sustainable technological development for adopting CE. So, stakeholders perspectives, CEps would catalyze technological development for ensuring resource conservation and resource efficiency. For sustainable economic and environmental performance, government initiatives to introduce law regarding waste management and encouraging CEps and involving international agreements for reducing emissions are also important (Sudusinghe and Seuring. 2022). CEps model will ensure economic growth and development by ensuring efficient production and reducing cost in operations, hence better

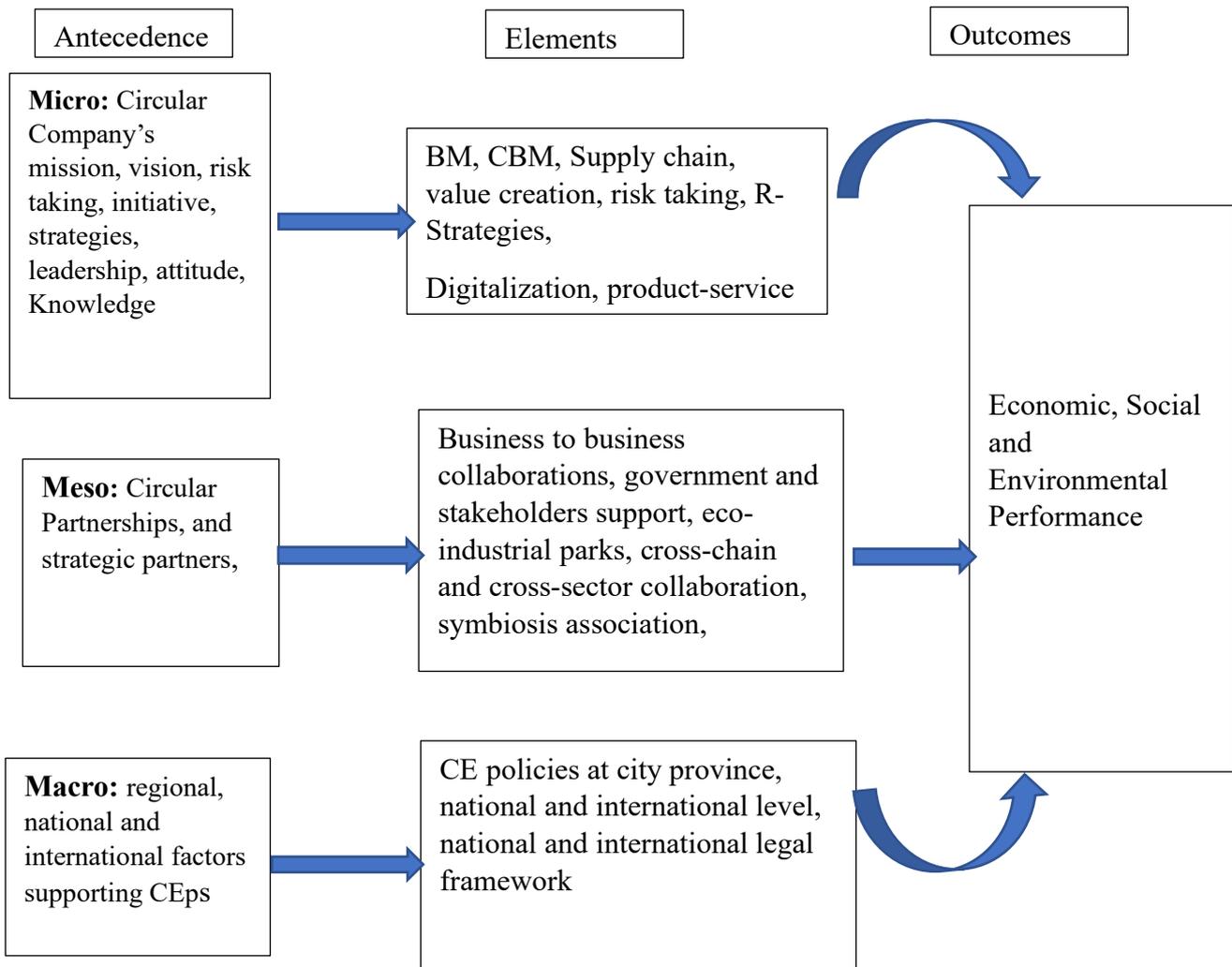
GDP growth for any country can be ensured. Overall CEps will provide a balance growth and ensure better performance in economic, social, and environmental perspectives.

## 2.10 A Circular Entrepreneurship Framework

Referring to the previous discussion researchers come up with the framework that integrate antecedence, elements and outcomes of the CEps. As we discussed some antecedences are controllable variables that organisations can monitor and redefine in their own way, such as company's mission, vision, risk taking, leaderships, initiatives and circular strategies that companies can redefine and reshape. However, some antecedences are not controllable, specifically, meso and macro variables are not controllable and entrepreneurs need to adjust with those variables and frame their organisational strategies while moving towards circularity. For example, companies do not have control on national environmental laws, international standards formulation. Similarly, some CEps elements organisation can control such as CBM, supply chain, and others they need to adjust with the changing situations. Performance outcomes should be measurable in terms of monetary and non-monetary yard sticks or standards.

## Circular Entrepreneurship Framework

### The Model:



**Figure:** Circular Entrepreneurship Model

## 2.11 Synthesizing The Circular Entrepreneurship Framework with Entrepreneurship Literature

The field of entrepreneurship is interdisciplinary, and many other disciplines and contexts contribute to it. Schumpeter (1934), a pioneer in the field of entrepreneurship study, stated that entrepreneurs are those who discover new chances by creating new goods, discovering new manufacturing techniques, looking for new raw materials, discovering new customers, or combining all of these strategies. Aligning with this view, CEps is also looking for new opportunities by developing new circular products by redesigning the products and restructuring the production methods through R-strategies. However, the notion of entrepreneurs or entrepreneurships also studied in multi-dimensional perspectives and the entrepreneurs' skill set need to be balanced to be competent and researchers termed it as "jack-of-all trades (Lazear, 2004)". In order to promote and develop entrepreneurship, it is important to understand the origins and components of this skill set. According to Lazear (2004), entrepreneurs are individuals who perform multiple tasks in order to be competent in the market. In the context of Circular Economy practitioners (CEps), a multidimensional skill set is also required to adopt circularity. For instance, CEps aim for sustainability, which necessitates expertise in economic, social, and environmental aspects. By combining all aspects of sustainability, CEps exhibit these skills set and CEps act like a "jack-of-all-trade". Therefore, CEps need to be prepared to possess a diverse range of skills in order to succeed in the Circular Economy field.

However, Dean and McMullen (2007) emphasized market failures and entrepreneurial actions to overcome it through effective utilization of natural resources. In this regard, sustainable green economy or ecological development through efficient use of natural resources can work as a key driver (Dean and McMullen, 2007). CE brings opportunities for entrepreneurs and

CEps derives from these opportunities integrating social, economic and ecological balance. Unambiguously, this integration indicates sustainable development where CEps can exploit sustainable opportunities and gain competitiveness by designing institutional structures that can fit in CE (Pacheco et al., 2010).

While dealing with entrepreneurial research, Van and Romme (2021) explained three types of entrepreneurial characteristics such as positive mode, narrative mode, design mode. In case of design mode, the nature of thinking is derived by ideal solution of a problem and inspired by purpose and intention of an entrepreneur (Van Burg and Romme, 2014). In the current research, the CEps is derived by design mode as these sorts of entrepreneurs are looking forward to solve the pressing problems of the society such as carbon emission and environmental degradation. It is evident that one of the key types of research in CEps is design thinking and bringing new business model and new product design that address climate change. CBM or BM innovation can contribute in shaping new design thinking. However, circular entrepreneur's knowledge, expectations, attitudes, beliefs, abilities constitute socialization that led to formation of organization for creating viable business entity (If et al., 1992). All these anticipatory socialization constructs are also important in CE entrepreneurial framework. In CEps model, authors conceptualize these elements at microlevel variables, because entrepreneurial attitudes and beliefs towards environmental issues are important to move towards circularity.

BM is very much relevant to the entrepreneurship or CEps research because this study explains the motivation of value creation and new venture creation that drive innovation in industries (George and Bock, 2011). Some scholars stated that BM is the construction of opportunity creation (George and Bock, 2011), however, some argue that market imperfection is the drive that create opportunity (George and Bock, 2011).

Start-up is one of the key components of the CEps framework. As a new phenomenon, the CEps requires some start-ups and fresh, born entrepreneurs, thus their intentions are crucial. Entrepreneurial intentions lead to create new business and there is a link between entrepreneurial activities and their intention (McSweeney et al., 2022). According to research, entrepreneurial innovativeness serves as a mediator in the relationship between entrepreneurial enthusiasm and intention (McSweeney et al., 2022). Success in this new reality depends on creative CEps ideas and the introduction of new technology. Therefore, an entrepreneurial commitment to circularity may be crucial to its transformation into CE.

While innovation and technology are critical for CEps, in the same token, transfer skills and entrepreneurial training can promote entrepreneurship in developing countries (Lado and Vozikis, 1997). Scholars argue that transferring technology and technical know-how from developed countries to the least developed or developing countries can upgrade quality of human resources and can develop entrepreneurship (Lado and Vozikis, 1997). In addition to technology transfer, entrepreneurial efficacy also requires a country's level of development, the method of technical transfer, and an organization's capacity to absorb these technologies (Lado and Vozikis, 1997). Based on the framework, authors also believe that technology transfer can be crucial in the transition to CEps and the adoption of CBM. The very nature of entrepreneurship is that it is not a static phenomenon, however, it is constantly evolving and dynamic in nature and structured with the process of social change (Dutta and Crossan, 2005). With this social change, entrepreneurs look for opportunities based on the information they have (Shane, 2000), perceived knowledge regarding the opportunity and how they exploits it (Choi and Shepherd, 2004), and also entrepreneurs find opportunities from mentors, forum or informal networks (Mathias et al., 2015). To utilize and take advantage of CE opportunities, CEps must educate themselves on industry trends and make use of their prior experience and social networks. The CEps framework emphasizes the value of social and industrial networks,

knowledge evaluation, and knowledge development in reference to environmental challenges. While framing entrepreneurship process, Ma and Tan (2006) identified four elements such as perspective, pioneer, performance and practice. Unequivocally, these elements of entrepreneurship also critical ingredients in CEps model. For example, in CE perspectives, entrepreneurs are getting new environmental regulations that change the industrial perspectives and competitive landscape. CEps also can be pioneer in developing new technologies and circular products to grasp the opportunities of CE. Efficient utilizations of resources also important for the firm performance where CEps can work as a tool.

In the final remarks, we relate entrepreneurship and sustainability issues and these issues are output of our model. Entrepreneurship has been recognized by researchers and politicians as an important element for sustainable development for more than two decades (Krueger and Deborah Brazeal, 1994). Circular entrepreneurs can exploit the sustainability opportunities by creating and discovering new ventures that are socially, economically and environmentally sustainable (Krueger and Deborah Brazeal, 1994).

## 2.12 Theoretical Contributions of SLR

The theoretical contributions of SLR regarding CE provide significant insights, particularly as the concept of circular entrepreneurship is still emerging. Recently, the CE has attracted considerable scholarly interest, focusing on both its theoretical underpinnings and practical implementation strategies, which has influenced research on circular entrepreneurship (Geissdoerfer et al., 2016).

Before 2000s, CE was not recognised as a distinct research field; its principles were scattered among various disciplines, including industrial ecology, environmental sustainability, and

engineering related to recycling and upcycling, indicating a wide range of antecedents (Merli et al., 2018; Bocken et al., 2017). This diverse intellectual background has spurred the development of literature on circular entrepreneurship, highlighting the necessity for a model that delineates its framework.

The first key contribution of this SLR is the creation of a model outlining the antecedents, components, and outcomes of circular entrepreneurship. The second contribution encourages researchers to explore the challenges faced by circular entrepreneurs empirically, providing practical recommendations to overcome these obstacles. Additionally, this model integrates issues related to the CE with unexplored entrepreneurial literature, stimulating further empirical investigation into circular entrepreneurship.

Thirdly, by synthesising literature pertinent to the circular economy (CE), the present research aims to foster the theory-building process for future scholars in the realms of CE and circular entrepreneurship. This endeavour contributes to the refinement and clarification of the concepts surrounding circular entrepreneurship.

Lastly, this theoretical framework will support scholars, researchers, and policymakers in promoting further research and generating innovative ideas within the domains of environmental management, sustainability, and circularity.

### 2.13 Policy Implications for Circular Entrepreneurship

The principal policy implications for addressing sea level rise (SLR) indicate that policymakers and governments should adopt our proposed model to advance and support circular entrepreneurship, thereby facilitating the transition towards sustainability and a circular economy. Although governments are increasingly concerned with sustainability and are striving to achieve the Sustainable Development Goals (SDGs), they currently lack sufficient awareness and a well-defined agenda regarding circular economy (CE) practices. Our model

aims to assist policymakers by identifying the critical components of circular entrepreneurship, which will guide the incorporation of CE principles into industrial practices and foster the development of a circular economy framework.

For example, policymakers could provide incentives, such as tax reductions and other benefits, to circular entrepreneurs who serve as catalysts for organisational transformation towards circularity. Our model highlights key variables at the micro, meso, and macro levels that governments can integrate into their policies, focusing on short-, medium-, and long-term strategies.

In the short term, policymakers can collaborate with organisations to help them align their missions and visions with CE principles. They can also promote partnerships at the meso level, connecting governmental and private institutions. In the medium to long term, at the macro level, governments can facilitate the development of national and international policies that enable local businesses to comply with established standards, furthering the progress towards sustainability and circularity. Furthermore, policymakers could initiate industrial symbiosis programmes and establish eco-industrial parks, which would provide additional support for businesses adopting circular economy practices.

## 2.14 Managerial Implications

The managerial implications of the model presented in the SLR offer valuable guidance to managers and entrepreneurs on how to transition towards a circular economy, identifying its key antecedents, components, and outcomes. First, this model uniquely classifies antecedents at the micro, meso, and macro levels. For the first time, it presents a comprehensive circular

entrepreneurship model that systematically outlines these antecedents, providing entrepreneurs with a clear framework for identifying the relevant factors and, consequently, transforming their existing business models to incorporate circular economy principles.

Second, the model defines the essential components for circular entrepreneurs, outlining the key elements that must be considered when transitioning to a circular economy. For instance, it organises these elements into micro, meso, and macro levels. At the micro level, managers are required to adapt various aspects of their operations, including business models, supply chains, digitalisation strategies, value creation processes, and risk management practices. These components are integral to facilitating the transition towards a circular economy.

Finally, through the application of these elements, managers can enhance their social, economic, and environmental performance. This distinctive model offers a structured approach for managers to transition to a circular economy, thereby contributing to the achievement of broader sustainability objectives.

## 2.15 Future Research Directions

The literatures on CEps and also CE are still new and growing day by day. The current literatures on CEps are focusing BM perspectives and related areas such as new startup or circular startup. Future research can look into different theoretical perspectives which have overlooked in this paper. For example, in future research they can view the CEps in the stakeholders' perspectives or they can look at it into resource- based view. There are lots of

opportunities to look at the CEps research as the concept is just growing. In this review we didn't consider innovation and related issues, business model innovation, dynamic capabilities of companies, technology and waste management, resource efficiency and internal capabilities, biological cycle and competitive advantage (Suchek et.al, 2021) as the research focus is on entrepreneurship and CE related issues. However, future research can focus the above-mentioned areas to do research and guide the field in specific areas. Furthermore, in entrepreneurship framework some issues have overlook in the current research such as new venture creation, social acceptance of CEps which maybe interest of future researchers. Although research stressed on entrepreneurial passion (Cardon et.al., 2009) in adopting new phenomenon (i.e., CE) such as unconventional risk taking , non-traditional business practices, the current research is interested more on CEps model, hence future research can look at into in line with these entrepreneurial issues. Research could also emphasize on sustainable entrepreneurship (Hoogendoorn et.al., 2019) in relation to the CEps which could provide a great contribution in the current literature of entrepreneurship.

The systematic review revealed that the current entrepreneurial literatures do not provide clear direction on this important issue and do not provide any link between CEps and its antecedents. We provided a direction and deeper research can be done based on our direction for getting a stronger relationship and connection between CEps and its antecedents. Future research can also outline more variables with micro, meso and macro level variables as antecedents and providing details is new in CEps literature that will also provide a strong theoretical contribution.

Future research may identify some mediating and moderating effect based on the current models and can provide interesting insights on it based on quantitative analysis. Future research also may deepen the literature based on the micro or macro level indicators. For instance, authors didn't discuss much about government and cultural aspects while adopting CE and developing model. However, both internal organisational cultures and external governmental and national cultures are also important in implementing CE principles. Future researchers can take into account these aspects and can investigate how these aspects affect in CEps process and how circular entrepreneurs address these issues while taking circular strategies. Future researchers also revisit and investigate the existing environmental entrepreneurship theories such as sustainable entrepreneurship, green entrepreneurship, social entrepreneurship to frame their own CEps finding their shortcomings. Future researchers also find how to measure the performance outcomes in terms of economic, social and environmental perspectives. Future researcher can also prove or disprove the current model analysing case studies in different industrial sectors. They can compare and contrast between the linear BM and CBM, linear supply chain and circular supply chain, traditional entrepreneurship and circular entrepreneurship, born circular entrepreneurship and adopted circular entrepreneurship. There are ample opportunities in doing research in CEps as the field of CE is still nascent stage.

## 2.16 Conclusion

Research on CE is growing and creating new opportunities for entrepreneurship development. While earlier researches provided different perspectives of entrepreneurial involvement in CE, linking CE in the CEps model and providing a comprehensive model of CEps is still missing. Hence, there are lots of opportunities to do research on CE and CEps, especially in the area of business, management, and social science perspectives. In this study, we focus on these areas

and we concentrate on emergence of new entrepreneurial activities. Further we look into issues such as circular startups, new circular venture creations, circular supply chain, BM or circular BM and so on. So far our knowledge goes, no research has been done that integrates and addresses above mentioned issues in CEps research. Our model on CEps and its antecedence, elements and outcomes clearly show that how the research on CEps and new business creation and entrepreneurial perspectives are growing and provide the scopes to do the research in near future. Managers, entrepreneurs, policy makers must think CEps and its profound contribution on providing innovative BM, revenue generation and sustainable development. To be competitive in the market and to be sustainable companies must come forward to invest in CE and CEps process that will help to transition from linear to CE.

Because of growing concern on environmental issues and climate change, consumers are now more conscious about their products and its ingredients. Future researchers can look into these issues in the lens of CEps and bring innovative solutions. New model of business and product-service design can give a competitive edge and to sustain in the market. Companies fail to address these issues will be out of the market. Responding to the market demand and act proactively is very important to survive in today's fast changing world. Growing popularity of recycled products and price competitiveness would motivate more circular entrepreneurs to come into CE business and to innovate new products and services for their own survival.

The current research will advance the theoretical foundations of CEps research and add valuable insights on new entrepreneurial endeavour. As literature review revealed that most of the researches are qualitative and conceptual in nature and no theory has been developed so far in this area, so very soon this would be minimized as the researches are growing very fast. Future researchers will bring new theories and/or apply existing theories to validate CEps and enrich the literature of entrepreneurship theories and practices.

## 2.17 Limitations

All literature review papers have some limitations, ours is not an exception. First of all, the study chooses words for searching articles which have no commonly acceptable standard. Based on the available articles and data in the current literature we choose the search query that may have some limitations. Another limitation is that we only include articles that are directly to CE and entrepreneurship. This inclusion may squeeze the scope of the research. However, later we included relevant articles to complement our literature and model. We didn't include scientific literature that may limit our scope of analysis. Moreover, we didn't do any quantitative analysis except journal characteristics. Quantitative analysis can bring more perspective and hence it could be done in near future. We limited our search only on peer reviewed articles. PhD thesis, conference papers, books and other materials could bring more information that we omitted in our study.

## Chapter Three

### 3.0 The paradox of Implementing Circular Economy in an emerging country

#### Abstract

The global shift towards a circular economy (CE) has driven a growing focus on addressing sustainability challenges within production and operational practices. Circular entrepreneurs adopting circular principles frequently encounter various paradoxes, yet current literature offers limited insight into these tensions, failing to propose strategies for managing or mitigating them. Acknowledging this research gap, scholars have identified distinct tensions faced by circular entrepreneurs during the transition towards CE and sustainability, examined through the lens of paradox theory. To address this gap, this study employs a case study approach, empirically investigating these issues within the context of a developing country. The research examines 32 manufacturing companies to explore their CE practices and the challenges they face when adopting circular principles. Semi-structured questionnaires and face-to-face interviews were conducted with industrial entrepreneurs and top-level managers. The analysis of this multi-case data reveals that entrepreneurs encounter three key paradoxes during the implementation of circular entrepreneurship: the waste-resource paradox, market paradoxes, and stakeholder paradoxes. Based on these findings, the study proposes a model and entrepreneurial strategies aimed at reducing these tensions and offers directions for future research on paradoxes in circular entrepreneurship.

### 3.1 Introduction

Climate change and environmental issues go hand in hand. Although simple solutions to climate change are elusive, however, scholars, practitioners, and scientists have identified an alternative solution called the "circular economy" (Manninen et al., 2018). This approach focuses on creating value through sustainable consumption and production and can be used as a tool to address climate change. A CE advocates the closed-loop materials flow and proposed an economy of regenerative resources (Ellen MacArthur Foundation et al., 2015; Manninen et al., 2018). CE is now also considered as an alternative to linear production system ('take-make-waste') and assisting organizations to achieve sustainable performance (Farooque et al., 2019). The transition from linear to circular economy needs a good number of entrepreneurs that can invest in recycling, reducing, and remanufacturing the product and services. In these circumstances, authors see the emergence of "Circular Entrepreneurship (CEps)" in the recent literature of entrepreneurship. Circular entrepreneurs are those who explore and exploit opportunities in CE domain (Zucella and Urban, 2019). While circular entrepreneurs are trying to adopt the CE principles, however, they face a lot of paradoxes within and outside the organization while allocating resources to adopt CE. In this context, authors also observed that the research on circular entrepreneurship in the lens of paradoxical theory is still missing in the extant literature. Our study fills this gap to a large extent by identifying the different paradoxes within organizations and showing how circular entrepreneurs face those opposing forces in their business by integrating external and internal factors and synthesizing their interactional mechanism.

Entrepreneurial activities are surrounded by some tensions and paradoxes. These tensions paradoxes are 'contradictory yet interrelated elements that exist simultaneously and persist over time' (Smith and Lewis, 2011, p.382). There is growing interest in the paradoxical theory in sustainability and circularity research and recent literature shows an upward trend of research

in this area (Roberta De Angelis, 2021; Hahn et al., 2018; Daddi et al., 2019). Hence, the main objective of the paper is to identify the different tensions and paradoxes that circular entrepreneurs face in adopting CE principles and how they are tackling those challenges with limited resources. Hence, the primary objective of this paper is to identify the various tensions and paradoxes that circular entrepreneurs encounter when adopting CE principles, and to examine how they address these challenges despite limited resources.

Today's world is increasingly dynamic and volatile, with organizations operating in a complex and evolving environment that generates paradoxical tension both within and outside the organization (Smith and Lewis, 2011). In this backdrop organizations need to be creative and utilize natural resources effectively and efficiently (Dameron and Torset, 2014). Moreover, organizations need to be competitive in the global market and need to provide sustainable products and services that are acceptable for international market and for stakeholders (Scherer et al., 2013; Marquis and Battilana, 2009). In this context, introduction of CE principles and demand for circular products make the situation more challenging for circular entrepreneurs. Therefore, it is imperative for circular entrepreneurs to adopt CE principles and at the same time deal with paradoxes and minimize the tensions for gaining competitive advantage. Given the aforementioned situational perspectives and context, this paper formulates the following primary research question: What are the principal paradoxes and tensions that circular entrepreneurs encounter when adopting CE principles in their production and operations?

CE introduces a holistic approach to organizational production and operations, relying on systems thinking (EMF et al., 2015). This interconnected and interrelated systems thinking generates tensions among various organizational actors (De Angelis, 2021; de Jesus et al., 2019, p. 1506). Recent literature on CE and paradoxical theory emphasizes on corporate sustainability (De Angelis, 2021), CE and business model (De Angelis, 2021; De Angelis, 2020), CE, supply chain, and sustainable goals (Wali et al., 2021), corporate sustainability and

CE (Dadi et al., 2018), CE and industry-retail symbiosis (Trento et al., 2021), CE paradox and innovation (Vence et al., 2022), industry 4.0 and paradox theory (Dieste et al., 2022). However, there is dearth of literature that integrates circular entrepreneurship and paradoxical theory and very little known about entrepreneurial context of CE paradox. This paper will minimize this gap to a large extent. Moreover, the field of circular entrepreneurship is very nascent and there is a significant opportunity to work current paradoxical issues of CE as the entrepreneurs are moving towards circular productions and consumptions.

Although Greer et al. (2021) discussed the waste-resource paradox in the context of the CE, our study examines this paradox from entrepreneurial and managerial perspectives, providing a valuable addition to the conceptual and theoretical frameworks in existing research. Very few studies address the waste-resource paradox within a single framework. For instance, Xia et al. (2024) investigated the waste paradox in the context of geographical advantages, while Porpino et al. (2015) discussed the food waste paradox and its impact on low-income households. Similarly, Muheirwe et al. (2022) examined the paradox of solid waste within a regulatory context in Africa. However, none of these studies address the waste-resource paradox in the context of entrepreneurship, specifically concerning emerging economies. Therefore, to address the main research objective, the first research question is: How can circular entrepreneurs minimize the paradoxes between resources and wastes?

There are very few research available in context of market paradox that address managerial and entrepreneurial context. De Angelis (2021) relates the CE and paradoxical theory to business models where products can be resold in the market. However, De Angelis (2021) does not delve into the specifics of market paradoxes, such as issues related to price, quality, investment, technology, and compliance. Greer et al. (2021) examined the waste-resource paradox and highlighted market barriers faced by small and medium-sized enterprises. Although several studies have indicated paradoxical tensions within the CE framework (Daddi

et al., 2019; Dagilienė and Varaniūtė, 2023; Vence et al., 2022; De Angelis, 2022; Tosi et al., 2024), there remains a lack of discussion on market issues, which is essential due to the emergence of CE in various sectors. Therefore, this market context leads to the second research question, which aims to achieve the primary objective: What are the market paradoxes in CE, and how can entrepreneurs explore and exploit market opportunities while minimizing these paradoxes by adopting CE principles?

Stakeholder engagement is critical in implementing the circular CE. However, few researchers have explored the paradoxical aspects of CE in relation to stakeholders. Jabbour et al. (2020) investigated the complex relationships between stakeholders and their impact on innovative business models and the sustainable performance of firms. Nevertheless, they did not address the paradoxes and tensions among internal and external stakeholders that can affect the adoption of CE. While some researchers have discussed CE and indicated stakeholder engagement (De Angelis, 2020; Mah, 2021; Gupta et al., 2019; Vence et al., 2022; Neisig, 2022; Luoma et al., 2023), none have explicitly explained stakeholder paradoxes and tensions, particularly in the context of emerging economies like Bangladesh. In this context, the third research question to achieve the main objective is: How can entrepreneurs minimize the paradoxical tensions among stakeholders and develop strategies to meet stakeholder expectations in the context of CE?

The research focuses on Bangladesh for several reasons. Bangladesh is recognized as one of the countries, most vulnerable to the impacts of climate change (World Bank, 2014; Climate Change Vulnerability Index, 2014; Nurunnabi, 2016). In the past two decades, Bangladesh has experienced 60% of global fatalities from climate-related disasters such as cyclones and floods (Nurunnabi, 2016). With a population of 173 million, it ranks as the world's eighth most populous country (Nurunnabi, 2016). Additionally, as an emerging economy and country, Bangladesh is a key player in textile production and export, which makes it particularly

vulnerable to the adverse environmental effects of the textile industry, alongside other sectors (Angel et al., 2015). Furthermore, like many developing nations, most industries in Bangladesh, including textile professionals, exhibit low environmental awareness. Although some have adopted environmental practices, the majority remain uninformed about the environmental repercussions of their industrial activities (Majumdar and Sinha, 2019).

The paper has numerous significant contributions in the development conceptual framework of CE and its paradoxical issues in the light of entrepreneurial initiatives. **Firstly**, the paper contributes in identifying the different paradoxes that encountered by circular entrepreneurs in transition to CE. Moving toward CE is a prime agenda for entrepreneurs as the international buyers are keeping pressures to adopt CE principles for tackling carbon emission and for environmental restorations. Moreover, currently there is a lack of literature that is integrating CE literature with paradoxes and fail to provide entrepreneurs context of paradoxes and tensions. Researchers strongly believe that the current paper will significantly contribute in understanding these paradoxes and formulates strategies to minimize tensions within CE.

**Secondly**, the paper employs explorative research to find the tensions among entrepreneurs and to elucidate current status quo of CE adoption and to explore novel strategies that Bangladeshi entrepreneurs are taking to tackle emerging issues related to CE and environment. So far our research and literature search, researchers unequivocally convinced that there is dearth of research of CE paradox in the context of emerging country like Bangladesh. Although Bangladesh is the 2<sup>nd</sup> largest ready-made garments producers and one of the emerging economies in the world, however, very few research has been done that related CE and CE related paradoxes. This paper will minimize this gap also to a large extent.

**Thirdly**, the paper provides a deep investigation into the entrepreneurial initiatives to tackle carbon emission with empirical evidence from 32 different companies of Bangladesh, an

emerging economy of the world, and highlighting stakeholders' perceptions regarding CE principles and market expectations for circularity.

**Finally**, the paper integrates various issues of paradoxical theory within the contexts of CE and circularity, culminating in the development of a macro-level theoretical model. This model offers a comprehensive perspective for entrepreneurs and serves as a roadmap to facilitate the transition to CE in pursuit of sustainability. Such contributions aim to enhance the existing literature on CE, circular entrepreneurship, and circular initiatives. Furthermore, the framework suggests future directions for entrepreneurs and managers to navigate towards CE by mitigating internal and external tensions and paradoxes within their organizations.

The paper organizes in the following ways: section-2 provides details on literature review followed by methodology, section-4 describe findings and data analysis, section-5 provides conclusions and future research directions, section-6 provides: limitations and last section provides details referencing and other bibliographical sources.

## 3.2 Literature Review

### 3.2.1 Theory of Paradox

The issue of sustainability paradoxes has got significant attention in the realm of circular economy and very few empirical studies have been done so far in the context of emerging economies that talk about diffusion of circular economy and sustainability in the lens Paradoxical Theory (Chiappetta Jabbour et al., 2020). Smith & Lewis (2011) defined paradoxes as, 'contradictory yet interrelated elements that exist simultaneously and persist over time'. Recently, 'Paradox Theory' has gained popularity in sustainability and circularity literature ( Han et al., 2018; Ivory & Brooks, 2018; De Angelis, 2021 ). Paradoxical theory also included in the very recent business model research (BM) and circular economy research (Daddi et al.,

2019; De Angelis, 2021). CE needs system thinking and paradox theory combines complexity thinking with system thinking (De Angelis, 2021; EMF et al., 2015). CE brought a revolutionary thinking and challenge the existing linear model of economy in an attempt to decouple economic growth for restoring natural resources, so this transition may bring tensions and face backlash from establish linear model (De Angelis, 2021; Hopkinson et al., 2018; lacy et al., 2019).

Paradox sometimes interrelated and also contradictory because in strategic lens paradox can evolve with opposing goals (Schad et al., 2016). Paradoxical theory proposed organizational tensions in terms of learning, organizing, belonging, and performing categories (Dieste et al., 2022). As Smith & Lewis (2011) explained that learning paradoxes develop at the time of innovation and change process because it replaces the existing establishment and build new phenomenon and make a trade-off between exploration and exploitation. On the other hand, organizing paradoxes emerge from the organizational process to achieve its goal (Smith & Lewis, 2011). However, belonging paradox stem from opposing forces or identities (individual or collective) and contrasting values, similarly performing paradoxes originated from opposing demand and roles such as internal versus external demand (Smith & Lewis, 2011).

Extant literature on paradox and circular economy brings some emerging concept and one of such concepts is waste-resource paradox (WRP). In WRP it is proposed that some materials can be a waste or a resource at any time of its life-time that based on who is dealing with the materials and what cultural, geographical, and legal context that have been used (Greer et al., 2021). Most importantly, the material output of a product at the end of life cycle (either waste or resources) is not resulted by its physical value, or material label rather it depends on its users (Greer et al., 2021). It also depends on market mechanism and dominant market actors such as company, government, customers those who determine prices of the product (Greer et al., 2021). Researchers deal with the present circular business model (CBM) and emphasize the

factors of drivers or barriers of CE, however, at the same time some researchers are skeptic concerning the implementation of CE that replace the linear economy (Camacho-Otero et al., 2018; Greer et al., 2021). Similarly, entrepreneurs are also concerned regarding CE tensions and paradoxes as the market is not yet ready for adopting CE principles because of eco-system yet to developed in this context.

### 3.2.2 Waste- Resource Paradox in CE

#### *3.2.2.1 Resource Paradox*

In the realm of CE, a majority of the entrepreneurs, scholars, policy makers are in paradox whether they will treat wastage as resources or not. This conception regarding wastage coined from the limitations of recovery and recycling operations in the current CE perspectives and fully circularity may be an illusion in the current situation (Cullen, 2017; Friant et al., 2020). Friant et al. (2020) argued that even if it is possible to maintain a full circularity of resources, however, the world needs to have a sustainable use of resources and requires a capping to global resource use for renew and recovery purposes. Limiting global use of resources has importance in wealth distribution world-wide and also important in geopolitical discourse as the world resource scarcity and global justice is being a big question in resource utilization (Bengtsson et al. 2018; Friant et al., 2020).

Global energy crisis is always being a political debate and every country wants to ensure a sustainable energy efficiency. CE brought a new opportunity to reduce energy crisis and dependency on virgin materials as wastage or secondary materials can be used for energy production with lower costs (Friant et al., 2020). So, waste or secondary materials are good sources for energy production and hence waste is treated as resources for many entrepreneurs.

Similarly, organized waste management can contribute in carbon emission and support climate change mitigation (Friant et al., 2020; Hawken, 2017).

#### *3.2.2.2 Waste Paradox*

From the development of eco-industrial parks to the implementation of industrial symbiosis (IS) and the circular economy, waste is a fundamental component of each concept, highlighting its significance in resource generation. Industrial symbiosis relies on the exchange of by-products or waste materials among industries. Researcher Chertow and Park (2016, p. 107) defined IS as, “networks of organizations cooperatively sharing **wastes** has created irresistible imagery and high hopes for a time when virtually all water, energy, and materials will be used more than once and not to do so will have become societally unacceptable.” The IS involves with sharing of by products and resources and provides a win-win situation for industries and works better in collective approach (Zucchella, and Previtali, 2019; Chertow, 2000). In a case study, Zucchella and Previtali (2019), showed that agri-based firm uses technologies to convert ‘worthless’ waste such as effluent from sewage, convert municipal waste into organic product, manure for stables from food waste. The case firm combined these organic wastes and mixed with other wastage based on their ingredients to produce output. Similarly, some firms produce biogas and electricity from waste generated from households and municipalities. Some entrepreneurs opined that waste is not only a resource but also waste management can contribute environmental issues by reducing pollution and carbon emissions (Zucchella, and Previtali, 2019).

Although waste can generate resources for the all types of industries and can mitigate climate change issues, however, for decades entrepreneurs, government, municipalities and local authorities consider waste as a problem and fail to effectively manage waste for recycling or upcycling (Zucchella, and Previtali, 2019). Waste management requires coordination among public and private firms, local and governmental authorities and of course initiative from entrepreneurs.

Some researchers found that good solid waste management can reduce environmental problems and a way to minimize the use of virgin raw materials, improve the soils quality and nutrients, clean air, diminish GHG emission (Ai and Leigh, 2017; Pollans, L.B., 2019). Waste management also works as a sustainability tool and many cities and municipalities are moving towards a Zero waste system (Pollans, L.B., 2019). These cities and municipalities also move to waste-to-energy process and they convert waste as a resource by producing energy from it (Pollans, L.B., 2019). This waste-to-energy process also solve many environmental problems by reducing waste landfill that generates GHG emissions, producing renewable energy although it has criticism regarding pollution and environmental justice (Pollans, L.B., 2019). The main criticism to power generation process is that the incineration process that generates energy can also produce toxic gas which is harmful for the environment. This also brings a new tension and paradox whether entrepreneurs go for incineration or go for landfill options although both options ended with GHG emissions.

Waste export and import (including e-waste) is now becoming a global business. Researchers found that developed countries export significant amount of waste to developing countries because of developed country's environmental regulations and cost contractions (Sthiannopkao and Wong, 2013; Breivik et al., 2014; Singh et al., 2023; Xia et al., 2024). This shows a trend

of waste as an income source and treated as resources although waste is considered useless in some developing countries (Xia, et al., 2024).

### 3.2.2.3 Waste-Resource Paradox Nexus

It is estimated that in the European Union (EU) total waste generated in 2018 was 23 million tons by all together economic and household activities ( Eurostat, 2020). World Bank (2018) estimated that annual global waste production is to increase 70% by 2050. These waste generation brings hope and concern at the same time and if it is not managed in appropriate way then it may increase climate crisis and aggravate this crisis further. The hope part is that entrepreneurs can convert these wastes into resources through the use of technology and recycling, however, if not maintain properly then waste would be great problems for the world. Greer et al. (2021) state that CE can convert these wastes as resources by transitioning from linear economy and industries are trying to remove waste from the production system by decoupling economic activity from natural resources. Further they state that waste resource paradox depends on certain perspectives such as who is handling waste, what is the treatment of products at end of its life, what is the cultural and locational factors exists and what is legal framework the waste or resources are transformed (Greer et al., 2021). In addition, it is not recommendable to stakeholders including government and business managers to support innovation blindly that seems a close loop system and stakeholders also need to look at resource efficiency of CE in regard to waste-resource paradox (Greer et al., 2021). It is critical to understand waste-resource paradox and it is also critical to examine the impact of waste-resource tensions on society and before accepting or welcoming any circular innovation (Greer et al., 2021).

### 3.2.2 Market Paradox

CE needs a strong market orientation for circular products because circular products are new to the market and customers have many misconceptions regarding circular products. Market orientation means its capability to adopt the marketing concept that is one of the most important organizing principles of the firm (Baker, and Sinkula, 2005). Market orientation reflects a firm's manifestation and a tool that focus market-related learning and it also focus customer needs ( Jaworski and kohli, 1993; Baker, and Sinkula, 2005 ). Baker, and Sinkula (2005) states that strongly market oriented firms understands; i) customers and their liking and disliking, perceptions, satisfaction ii) customer's economic and socio-cultural trends, competition iii) firm's ability to influence customer through technology and regulation. Firms with strong market-orientation have the ability for adaptation and this adaptation leads to new product development and firms get sustained competitive advantage (Baker and Sinkula, 2005). CEs need to adopt CE principles and needs to be strong circular market orientation for new circular product development and for gaining competitive advantage. However, while circular entrepreneurs try to adopt circular market orientation they face several market related paradox.

#### *3.2.2.1 Market Demand: Price and Quality*

Price and quality relationship termed as price-quality schema by Lichtenstein et al. (1993) and it is assumed that there is a positive relationship between price and quality (Zhou et al., 2002). This presumption leads to a belief that price indicates product quality and higher the price of a product assumed that higher the quality of that product (Zhou et al., 2002). Price-quality

schema works differently in different countries. For instance, high quality and low price works better in Japan, high quality and high price perform better in the EU region, low quality and low price is welcomed in the United States market (Brouthers et al., 2000; Zhou et al., 2002). However, the price quality paradox also exists in CE. Circular products assumed to be low quality for many customers and hence they don't want to pay high prices for that (Grafström, and Aasma, 2021). On the contrary to general perceptions, recycled plastic is costlier than the regular plastic because recycled plastic needs more quality control and this also make a paradox on price-quality issue (Grafström, and Aasma, 2021, Milios et al., 2018). Some researchers found a mix perceived price-quality paradox. For instance, in some cases price increases if the products are green and demand diminishes if price increases as some customers are agreed to pay higher prices for green and recycle products (Schlosser et al., 2021; Nielsen, 2014). Research also shows that customers are not willing to pay good prices for recycled or refurbished products such as tires (Hamzaoui-Essoussi and Linton, 2014), because they perceive recycle products are inferior in quality. This brings a 'perceived functional risk' with recycled products and it is related to the brand's strategy how they influence customer through their brand for recycled products (Hamzaoui-Essoussi and Linton, 2014). Interestingly, brands have not yet provided any clear role and expectation regarding recycled products hence consumers are not getting confidence for having greener products (Hamzaoui-Essoussi and Linton, 2014). Consumer's willingness to pay for greener products will be low if the perceived quality of the greener products are low and hence strong brands in the market can influence the perceived quality and risk of environmentally friendly products (Hamzaoui-Essoussi and Linton, 2014).

Quality paradoxes are prevailed in the CE and these paradoxes bring tensions among entrepreneurs. In some cases, material quality does not vary too much between virgin and recycled material (Hamzaoui-Essoussi and Linton, 2014). On the other hand, some materials'

quality degraded in recycling process such as paper and plastics (Hamzaoui-Essoussi and Linton, 2014). Similarly, used products has also negative perceptions among consumers regarding its quality (Guide, et al., 2010; Hamzaoui-Essoussi and Linton, 2014; Hanss and Böhm, 2012). However, Mobley et al. (1995) stated that consumers consider recycled products as eco-friendly and it leads to consumer awareness and also increased demand for recycled products. So, recycled products act as doubled-edge sword and have opposite role in the economy.

### *3.2.2.2 Production and Operations: Technology and Investment Paradoxes*

Production and operations are internal paradoxes and that lead to some tensions between technology and investment, because productions and operations activities directly link to the technology. Investment and it's planning also depend on technology and its quality and from customer perspectives technology is the most important thing that entrepreneurs need to consider (Brax, 2005). Entrepreneurs always try to achieve efficiency in production and operations, however, producing new product with cost-effective way is difficult (Baker, and Sinkula, 2005). Some researchers found that innovation expenses and performance has a negative relationship (Gatignon and Xuereb, 2001) while others reported that innovative firms have efficiency issue (Sethi , 2000). Similarly, entrepreneurs and managers believe that product quality depends on innovativeness of the firm although some entrepreneurs implicit that frequent changes in technology can disrupt the synergy among the production and manufacturing activities ( Sethi, 2000; Baker and Sinkula, 2005). This is the technological paradox that entrepreneurs are facing now. On the other hand, some researchers and entrepreneurs are also argued that technological change may diminish the competencies of established technologies (Henderson and Clark, 1990; Christensen and Bower, 1996). The issue

of technological competence is an investment issue because lack of competence of technologies lead to poor performance of meeting customer needs and demands (Christensen and Bower, 1996).

Although Christensen and Bower (1996) stated that it is technological inertial to move towards better technologies, however they also indicate that it is also firms' inability to change the strategy that deter to adopt new technologies. Sometimes strategy needs to avoid resource allocation to some product development although resource allocation is the key to implement any strategies (Christensen and Bower, 1996). This is also a paradox while dealing with strategy and technology. Entrepreneurs and managers must align their disruptive technology with resources while dealing with customer needs.

There is a tension between leading firms and new technologies because later initially involve new markets as the new technologies brought by new firms (Christensen and Bower, 1996). Besides this, established firms confronted with new firms and technologies and hence start investing heavily in traditional technologies (Christensen and Bower, 1996). Some entrepreneurs may commit some resources for new technologies; however, they fail to keep their commitment to provide adequate resources for new technologies (Christensen and Bower, 1996).

### 3.2.3 International Standard: Market Compliance and Government Compliance

#### *3.2.3.1 International Standard and Market Compliance*

Entrepreneurs entering into global trade need to comply with international standards and it is very important steps for international business (Bruckner, 2004). Bruckner (2004) suggested that while maintaining in international or market standard, developing countries need to follow

importing country's requirement and satisfy all the requirements or build trust and reliability of importing countries. Some scholars emphasize that international management standard compliance needs technical knowledge, social infrastructure, and organizational skills (Freitas and Iizuka, 2012; Hatanaka et al., 2005; Jaffe and Masakure, 2005). However, these skills are not available to meet the international compliance in developing countries that bring another tensions and paradoxes.

In case of market, Dagilienė and Varaniūtė (2023) revealed that companies are compelled to implement circular solutions influenced by market along with government. In this case, manufacturing companies adjust with some accreditations, certifications and supply-chain related requirement (Dagilienė and Varaniūtė, 2023). There is a contradictory situation between regulations and uncertainty of implementing future regulations or change of regulations. According to Dagilienė and Varaniūtė (2023) government compliance and regulatory concepts can create obstacles of companies' compliance when the legal definitions are confusing or not clear among the entrepreneurs. However, it is observed that some entrepreneurs are just complying with existing regulations and avoid proactive regarding environmental regulations while others are proactive and responsible in their operations to be more circular (Dagilienė and Varaniūtė, 2023). This opposite temporal tension exist in the industries and sometimes future compliance ( i.e., EU targets for 2030 and 2050) can't support the existing regulations across industries (Dagilienė and Varaniūtė, 2023). For instance, EU circular policy requires to produce products that meet the target of 2030 and 2050, however companies are producing products for the current customers that make it difficult to follow the future target (Dagilienė and Varaniūtė, 2023). Companies also meeting environmental regulations for the international buyers and following waste management, packaging or product safety that all related to circular initiatives meet the current demand of the market (Dagilienė and Varaniūtė, 2023).

### *3.2.3.1 Government*

Government provides numerous regulations to control unsustainable industrial practices (William and Ponsford, 2009). Government can enforce law or provide regulations to non-compliance companies to follow the environmental regulations to save the mother earth (William and Ponsford, 2009). The role of the government is very important for sustainability because governments all over the world adopted UN sustainable development goals in 2015, although how businesses and entrepreneurs can help in achieving SDGs is understudied till now (Joseph et al., 2020). In a study on sustainable city, Hassan and Lee (2015) showed that government need to save financial resources for environmental and social issues through using effective and efficient energies and move to renewable energies for sustainability. Kazancoglu et al. (2021) recommended that government must have a vision towards sustainability and circularity, need to change public purchasing policy align with circular purchasing, and build awareness among government officials. Similarly, the influence of government towards environmental issues are critical while transitioning from traditional economy to CE and government need to be proactive in taking actions regarding CE practices (Kazancoglu et al. (2021). However, government can't comply or enforce compliance against industries because government has limitations for doing these. Some researchers argue that although the production is now global issue, however the compliance remain local and fail to meet the global standard (Distelhorst, et al., 2015). These global and local differences also create tension and paradoxes among entrepreneurs.

### 3.2.4 Stakeholders Paradox: Internal and External

Firms are integral part of both internal and external stakeholders and firms' activities have impact on stakeholders of the society (Mies and Gold, 2021). Stakeholders' participation in transitioning to CE specially CE related research and innovation is very important for building socially ethical and environmentally sustainable economy (Mies and Gold, 2021; Inigo and Blok, 2019). CE requires intimate cooperation from stakeholders along with supply chain because of interdependence of stakeholders among various actors of sustainability and circularity (Korhonen et al., 2018; Mies and Gold, 2021; Millar et al., 2019). Although cooperation and collaborations are important for CE, however, it is observed that some conflicts may arise among the internal and external stakeholders because of opposing environmental and economic benefits are seeking from different stakeholders (Manzhynski & Figge, 2020; Dagilienė and Varaniūtė, 2023). Tensions also emerge between environmental and financial goals among stakeholders as financial goals are more important for companies for its survival while society wants more environmental responsibility from companies rather than financial gain (Chen & Eweje, 2022; Dagilienė and Varaniūtė, 2023, Hahn et al. 2015).

Internal tensions and paradoxes include organizational-level tensions that originate from stakeholders' 'inconsistent demand' evident from conflicting goals and strategies within the organization (Dagilienė and Varaniūtė, 2023; Iivonen, 2018; Smith & Lewis, 2011). and competing roles, values, and identities (Smith and Lewis, 2011). For example, managers may focus on implementing CE principles and force employees to comply with rules that grossly undermine these principles. However, employees may find it difficult to comply with circular principles because of lack of technologies and available logistical support from the

management. These internal tensions always seems as a tug of war between management and employees and in CE perspectives these tensions may intensify because of role conflict among them. Similarly, sometimes management wants to reduce the cost, however, adopting technologies to implement CE principles may increase the cost at least in the short-run. So manager need to think long-run benefit to minimize this tensions. Finally, internal and external stakeholders' conflicting objectives, needs make up performing paradoxes (Smith and Lewis, 2011). There is always a eccentricity between management and external stakeholders. For example, external stakeholders may want sustainable products, however, they are not willing pay for environmentally friendly products. This conflicting situation addresses in the performing paradoxes and researchers provide recommendations to reduce it in the later chapters.

### 3.3 Methodology

The study has adopted a qualitative research design, as it is well-suited for examining emerging and novel fields (Zhang et al., 2022). Additionally, the research approach employed here is characterized as deductive in nature. In this study, the authors have developed a theoretical model that investigates into different paradoxes while adopting CE in the lens of Paradoxical Theory. Moreover, the authors have employed a case study methodology to empirically investigate the issues related to CEps (Yin, 2013). This exploratory investigation is aptly aligned with addressing the research questions, and in this instance, the authors have conducted a multi-case study. Given the new and intricate nature of the issues surrounding CEps in industrial settings, the utilization of the multi-case study approach has enabled a more profound exploration and comprehension in order to address the research questions effectively. Moreover, the utilization of multi-case analysis proves to be efficacious in procuring valuable research insights across diverse contextual settings and various industries (Zhang et al., 2022).

In addition, the authors employ an abductive approach in their endeavor to advance theoretical constructs, synthesizing novel perspectives on CEps and incorporating deductive techniques to integrate fresh conceptual frameworks (Dubois and Gadde, 2002; Zhang et al., 2022).

Authors use purposive sampling techniques in the selection of case firms (Yin, 2013). The criteria for selecting these firms were grounded in their engagement with circular economy practices, encompassing those demonstrating some form of circular economy initiatives, a willingness to participate in data collection and interviews, and representation from diverse industrial backgrounds. To identify and approach entrepreneurs and top-level executives from these selected firms, the authors leveraged personal networks, engaged with industrial associations, and collaborated with professional bodies within their research domain.

The initial phase of data collection was conducted face-to-face, with data quality assessments performed after obtaining information from each firm and initially authors collected 20 case companies. This phase of data collection transcribed between October 2022 and January 2023. Following an initial analysis of the collected data, the authors made the decision to expand their data collection effort further. The subsequent phase of data collection took place from March 2023 to May 2023, ultimately leading to the authors achieving theoretical saturation with 32 case firms. After second phase data collection, authors reached theoretical saturation.

The selection of case firms was exclusively limited to Bangladesh due to the research's sponsorship by the Commonwealth Scholarships Commission, which mandated a focus on sustainable development within the researcher's home country. Notably, a substantial number of case firms (32 firms), characterized by diverse backgrounds and contextual settings, were included in the study.

The authors employed in-depth, semi-structured interviews as their primary data collection method, citing its capacity for flexibility and in-depth exploration of interview conversations

(Eisenhardt, 1989). The interview questions are provided in Appendix A, while **detailed profiles** of the participating **firms** can be found in **Table 1**. Notably, the interviewed entrepreneurs possess considerable experience, with some holding positions as business leaders, presidents, or former presidents of professional bodies. A subset of these individuals boasts more than four decades of experience in the manufacturing industries, boasting extensive expertise in sustainability and circularity.

### 3.3.1 Profile of Case Companies, Interviewees and Data Sources

The profile of case companies, industry or sectors, their business activities number of interviewees, and data sources are provide in the following table.

**Table 1. Profile of Case companies, interviewees and Data Sources.**

Firms/Case Code	Region	Industry sector and business activities	Number of employees	Number of interviews	Designation	Data Source
1	Chattogram	Garments	28,000	2	Sustainability manager and Head of HR	Interview
2	Dhaka	Garments	861	1	Entrepreneur	Interview and websites
3	Chattogram	Garments	35,000	2	Entrepreneurs And Sustainability Head	Interview, factory visits, and websites
4	Dhaka	Garments	550	1	Entrepreneur	Interview and websites
5	Dhaka	Safety Gloves and equipment	10,000	2	Sustainability and Production Engineer	Interview and websites
6	Chattogram	Garments	40,000	3	Entrepreneur, Sustainability manager, Head of HR and Planning	Interview and websites
7	Dhaka	Garments	10,000	1	Entrepreneur	Interview and websites

8	Dhaka	Garments	1,400	1	Entrepreneur	Interview and websites
9	Chattogram	Building Constructions	5,00	1	Production manager	Interview and websites
10	Dhaka	FMCG	7,180	1	HR Manager	Interview and websites
11	Dhaka	Power Generation	5,00	1	Production Engineer	Interview
12	Dhaka	Garments	21,000	1	Head of HR	Interview and websites
13	Dhaka	Pharma	10,800	1	Head of Quality	Interview
14	Dhaka	Garments	15,245	1	Head of Sustainability	Interview and websites
15	Chattogram	Paper	1,000	1	Managing Director	Interview
16	Chattogram	Garments	750	1	Entrepreneur	Interview
17	Chattogram	Steel Manufacturing	2,286	1	CPO	Interview and websites
18	Chattogram	Garments	7,000	1	Deputy General Manager	Interview and websites
19	Dhaka	Constructions and others	35,053	2	Head of Market Intelligence, Head of HR	Interview and websites
20	Chattogram	Garments	25,000	1	Head of Finance	Interview and websites
21	Dhaka	Garments	18,000	1	Head of HR	Interview
22	Dhaka	FMCG	1,50,000	1	Entrepreneur	Interview and website
23	Dhaka	Waste Management	20	3	Two Entrepreneurs, and one scientist	Interview
24	Chattogram	Steel Manufacturing	2,800	2	Head of Marketing, Head of production	Interview
25	Chattogram	Chemicals	10	1	Entrepreneur	Interview
26	Chattogram	Agriculture	12,500	1	Entrepreneur	Interview and website

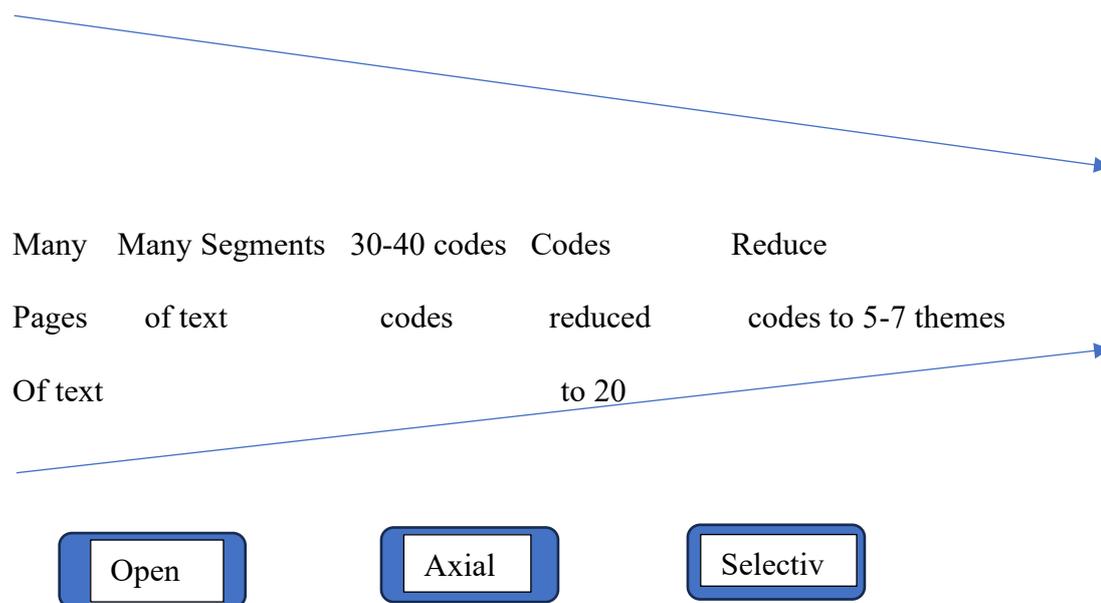
27	Dhaka	Plastic Products	250	1	Entrepreneur	Interview
28	Dhaka	Paper Mills	200	1	Production Manager	Interview
29	Dhaka	Bio-plastics	75,000	1	Scientist	Interview
30	Dhaka	FMCG	10,000	1	Head of HR	Interview and websites
31	Dhaka	Pharmaceuticals	3,000	1	Head of Quality Assurance	Interview
32	Chattogram	Ship making and repairing	1,000	1	Head of Commerce and purchase	Interview

In order to enhance the robustness of the research, the author adhered to the principles of triangulation (Tracy,2010), involving the incorporation of multiple sources of secondary data to corroborate the findings derived from interviews. This triangulation methodology serves to validate the insights obtained through interviews. Furthermore, the authors capitalized on the opportunity to conduct interviews with multiple representatives within the same firm, a practice that yielded a wealth of diverse information from various backgrounds.

The author ensured the validity and reliability of their data collection through rigorous checks for consistency across various interviews. To assess construct validity, researchers incorporated semi-structured interviews from multiple sources (Yin, 2008). Additionally, the findings underwent scrutiny by two impartial senior academics as a means of further validation. To address internal validity concerns, the authors adhered to a structured data coding and analysis process (Yin, 2008; Williams & Moser, 2019).

### 3.3.2 Details of Coding Protocol

Researcher adhered to the coding protocol outlined by Williams and Moser (2019) as a central component of their methodology, with the primary objective of establishing well-defined, rigorous, and consistently applied coding procedures to uphold the validity and reliability standards inherent in qualitative research (Williams & Moser, 2019). As the **figure 1.** shows, the coding process comprises three distinct stages: open coding, axial coding, and selective coding. These stages are visually illustrated in the accompanying figure, which provides a clear depiction of the entire coding protocol.



**Figure 1.** Overview of coding process: Open, Axial and Selective Coding (Adopted from Williams and Moser, 2019)

Open coding represents the initial phase of the coding process. During this stage, the researcher's primary task is to identify discrete concepts and themes for subsequent categorization. This involves the organization of the initial, unstructured data by creating broad

thematic domains to facilitate the assembly of data. As articulated by Williams and Moser (2019), the objective of open coding is to transform data and observed phenomena into conceptual expressions. The effectiveness of open coding hinges on the methodical and organized consolidation of thematic elements and concepts derived from the data collection process (Williams and Moser, 2019).

Axial coding constitutes the second phase in the coding process. In contrast to open coding, which centers on the identification of emerging themes, axial coding serves to further hone, align, and categorize these themes. Upon the conclusion of open coding and the transition to axial coding, the collected data undergoes a process of sifting, refinement, and categorization with the specific aim of creating well-defined thematic categories in preparation for the subsequent stage, known as selective coding (Williams & Moser, 2019).

Axial coding is instrumental in discerning connections between the open codes, with the objective of establishing core codes. These core codes manifest as amalgamations of the most closely interrelated or overlapping open codes, substantiated by robust supporting evidence, as expounded by Strauss (1998, p. 109).

Selective coding represents the third and final phase of the coding process. It empowers the researcher to judiciously choose and amalgamate organized data categories derived from axial coding into coherent and meaningful expressions. As elucidated by Flick (2009, p. 310), selective coding advances the work initiated during axial coding by operating at a higher level of abstraction. This entails actions that contribute to the elaboration and formulation of the narrative or case under examination.

At the heart of this process, which facilitates the emergence of a coherent story or case from the data categories, lies the refinement of data, the selection of the primary thematic category, and the systematic alignment of this principal theme with other categories that have undergone selective coding. This approach, as articulated by Strauss (1998, p. 158), holds significance in the context of rendering the yield from selective coding as a 'case' or 'story,' which, in turn, equips researchers with versatile and multifaceted tools for encoding and presenting study outcomes

### 3.3.3 Coding Protocol for Developing Themes

Table 2. provides detailed process for developing themes. Our coding data for developing themes follows three stages. Following Koller, et al. (2022), we first coded data in terms of content, then use categories to present data and to look how entrepreneurs take decisions based on the CE opportunities. Finally, we showed the code with exemplary quotes to provide evidence. The following Table 2. provides the details of coding protocol such as code structure, exemplary quotes and content:

**Table 2. Structure of Coding and Content of Market Opportunities and Paradoxes and exemplary quotes**

Company Code	Paradoxes and content	Coding issues and focus					Exemplary Quotes
		R	W	I	T	M	
1	<b>Market Standard</b>	x			x	x	1. "Another external challenge is mindset of buyers, every time please give recycle fabric, please ensure your energy efficiency, please don't incinerate your waste, please ensure waste circular recyclability or reuse, please waste water treat properly, ensure waste water treatment, but everything need cost, but they don't increase our product price." 2. "Our textile factory established membrane-based reactor technology"
2	<b>Technology</b>		x		x	x	" Now, we are getting more sophisticated machines are getting more sophisticated and the speed is increasing, and the flexibility of the machine

							is increasing. But, for that, you need a certain kind of strength of yarn. Recycled yarn is not fit with sophisticated machines.”
3	<b>Stakeholder</b>	x		x	x	x	1. If we can establish more solar power plant, we will overcome the energy shortage. But unfortunately, you can see the government imposed 26-30% duty on the solar equipment, which is really doesn't make any sense.” 2. “Our facility is also certified on GRS(Global recycling standard), and Recycled Claimed Standard. We are working with H&M, M&S, TESCO, and we are producing for all of them based on 3 standard”
4	<b>Stakeholder</b>	x				x	“When we talk about govt. policy, then it is a different story, because government need to a make a formal CE policy”
5	<b>Technology</b>	x				x	“So that innovation, that technology there is huge lacking in the market in Bangladesh.”
6	<b>Stakeholder</b>	x	x	x	x	x	1.“We need the help from the government, from the donor agencies”, 2.“each and every year we have to put data in HIG platform....you have to implement ZLD”, 3. “international brand coming with standard, USA brand Contour coming with same standard” Head of Planning,
7	<b>Technology</b>	x				x	“Technology in third world country like ours, not developed”
8	<b>Stakeholder</b>	x				x	“Multi-national and development partner come forward, the green climate fund.”
9	<b>Stakeholder</b>	x				x	“This has to be initiated by government in all case, so that there is big barrier.”
10	<b>Technology</b>	x		x	x		“I think another problem is the technology. We have, technology is the biggest problem. Most of our companies are not interested to investment in recycling process.”
11	<b>Stakeholder</b>	x				x	“Our government should be stricter in implementing the three-year policy. Bangladesh government has a three-year policy, but these things are not being implemented in every way.”
12	<b>Technology</b>	x				x	“Definitely technology is not easy, and technology know how is also difficult and also skilled manpower are also very very difficult to get. People are not that level trained”.
13	<b>Market Standard</b>	x				x	“W.H.O is the biggest guidelines that we are following in the Pharma industry...We are following British Pharma Copia and United States Pharma copia”
14	<b>Stakeholder</b>						“As I have mentioned earlier, the government has some policies and as per those policies, banks are yielding or lending money on green technologies”
15	<b>Stakeholder</b>	x				x	“Our market is government organizations like universities, colleges, schools, National Curriculum and Text Board (NCTB). Small percentage

							of paper they purchase is enough for KPM (Karnaphuli Paper Mills) survival.”
16	<b>Stakeholder</b>	x			x	x	“That is the opportunity, but things that I think, government should take this step, number one.”
17	<b>Market</b>	x				x	“So the China competition is one of the major challenges that we are going to face for sure, and the world recession that this is the most, the 2 <sup>nd</sup> challenges that we are facing right now.”
18	<b>Market</b>	x			x	x	“You need this competitiveness because end of the day my customer is looking for the sustainable supply chain. In the same time the most efficient prices because you know, this is a price moving industry, the customer will not buy if the price goes higher. So, always we have to be competitive in the market.”
19	<b>Market</b>	x				x	“I would not say there would be any conflict between the government or corporations like us. We would love to go hand in hand. They will surely converge into the goal, I believe....we are facing some challenges from the government organizations like as I told you the government has to approve these aggregates that we are using in the construction activities”
20	<b>Market</b>	x			x	x	“Every year we are getting some in puts from our buyers ....that we have to be adaptive in our industry to take the sustainability the first things.”
21	<b>Technology</b>	x			x	x	“Whenever any garment is produced, there is a requirement of shrink thread. So, there are some common colors like black, white, red, yellow, and a few common colors....multi-color is a problem in processing...”
22	<b>Stakeholders</b>	x	x	x	x	x	“So, the cost is the most important thing and we want government organizations to start working on these types of things....government is the main factor, customers are least bothered”
23	<b>Stakeholders</b>	x		x	x	x	“ <b>Yes</b> , Government is helpful on this waste management sector. But, there is something that there are some people who don’t want this because they hampered their business. You know the waste collection is the biggest business in Bangladesh.”
24	<b>Stakeholders</b>	x			x	x	“ <b>Challenges are internal</b> , because this is a process. So, we have to train the people. If you don’t get proper people in proper time for production and other things, this is one of the challenges to people management.”
25	<b>Technology</b>		x	x	x	x	“ <b>At</b> this moment, it’s very difficult. In Bangladesh, we have faced a lot of problems like capital, technology. In future I think it will be easy if we get technology.”
26	<b>Technology</b>		x		x	x	“So, the technology is very costly...Waste management is very costly...In Bangladesh technology is unavailable. And even if you buy technology,

							there is a power supply issues and there are maintenance issues. There is lot of operational issues...”
27	<b>Resource</b>	x	x		x	x	“For one party, the plastic may be wastage, but the wastage can be raw materials for another party. So, the companies which are producing water bottles and after using the bottle their wastage may be raw materials for the packaging companies.”
28	<b>Stakeholders</b>	x			x	x	“We don’t get any direct motivation from the government. But centrally the government tries to ensure the green economy.”
29	<b>Stakeholders</b>	x				x	“There are many viable alternatives to plastic, such as bio-plastics produced from starches. Starches are readily available and are human food items. However, there is a danger that bio-plastics contain some plastics in the starches.”
30	<b>Stakeholders</b>	x			x	x	“Two sorts of challenges are there. One from the regulatory side or government side. We have to be more and more attentive and careful and the vigilance and governance from the regulatory side..”
31	<b>Technology</b>	x			x	x	“The technology may not be able to add up all the pharma company. Okay, I feel that the top management as well as the finance, not taking such way. So, then we have to take it seriously. But they are doing all these things to manage the authority....They are not intend to go for modern technology...”
32	<b>Stakeholders</b>	x			x	x	“ <b>But</b> though in the govt regulations, we have some encouragement, but we don’t find it there are some compulsions and there are some strict body who can compel us to comply those to facilitate the recycling something.”

Note. R=Raw materials, W=Waste Management, I=Investment, T=Technology, M=Market

### 3.3.4 Validity and Reliability

Validity and reliability are crucial criteria for determining and evaluating the quality of qualitative research (Bryman, 2016). Validity pertains to the extent to which a study accurately observes, identifies, or 'measures' the concepts it claims to examine, as well as the degree to which the findings can be generalised to other social contexts (Bryman, 2016). In contrast,

reliability primarily focuses on the consistency of the measures employed in the research (Bryman, 2016).

In terms of external validity, in this research the authors adopted a multi-case approach along with purposive sampling, which is in accordance with established practices. To enhance reliability, the authors implemented a comprehensive case study protocol. This protocol encompassed recording and transcribing data, as well as engaging in iterative discussions with the research team (Yin, 2008). Each interview's length 40 to 60 minutes on average.

Table: Research reliability and validity (Adopted From Zhang et al., 2022).

Tests	Application in this research
Construct validity	<p>Numerous sources of evidence, including semi-structured interviews and various forms of secondary data</p> <p>A chain of evidence: multiple interviewees within organization when possible</p> <p>Review of findings by two senior academics/supervisors</p> <p>Interviewees revised the transcripts with elucidation and feedback</p>
Internal validity	Controlled data coding and analysis
External validity	<p>Purposive sampling approach</p> <p>Use replication in multiple case studies</p>
Reliability	Use case study protocol to guide field research and analysis

Develop case study database including recordings, transcripts, internal documents and news coverage, websites search.

Iterative discussion among the research team

In terms of external validity, in this research the authors adopted a multi-case approach along with purposive sampling, which is in accordance with established practices. To enhance reliability, the authors implemented a comprehensive case study protocol. This protocol encompassed recording and transcribing data, as well as engaging in iterative discussions with the research team (Yin, 2008). Each interview's length 40 to 60 minutes on average.

To guarantee the validity of the data, we requested that the participating organisations provide access to entrepreneurs, senior managers work in sustainability departments and those who have knowledgeable about recycling or CE practices. This approach was intended to ensure a comprehensive understanding of each firm's sustainability practices and its influence on company's performance. Additionally, we sought to conduct interviews with multiple representatives from each participating organisation (Zhang et al., 2022).

To ensure the reliability of the data, we employed triangulation by cross-referencing interview data with various secondary sources (Zhang et al., 2022). Some participants supplied internal company documents related to their sustainability initiatives. In addition, we analysed information from the companies' websites and relevant government agencies. Where discrepancies arose between the data sources, we conducted follow-up discussions with certain interviewees to clarify these inconsistencies (Zhang et al., 2022).

## 3.4 Findings

### 3.4.1. Waste Resource Paradox

Drawing upon the insights gleaned from field data, the primary paradox observed among entrepreneurs pertains to their conceptualization of generated waste, wherein some regard it as a valuable resource. Nevertheless, a subset of entrepreneurs exhibits reluctance to leverage such waste as a resource, positing that doing so might lead to a diversion of their business focus and an escalation of costs. This juxtaposition engenders a paradoxical tension between the perception of waste and its potential utilization as a resource within entrepreneurial endeavors.

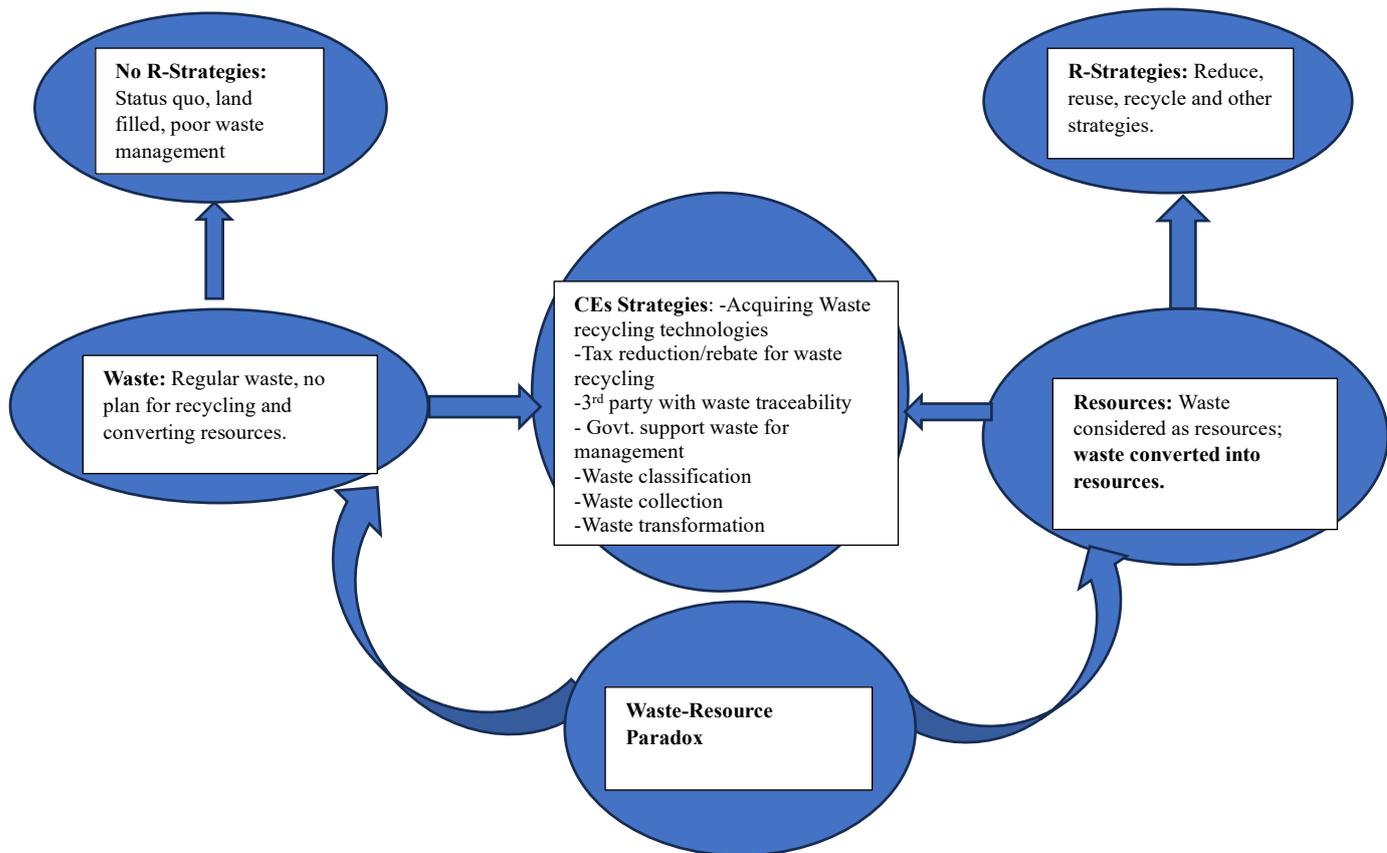
According to Head of Sustainability of a garments industry (Case code-18), *“They give it into the, they also sell it into two different parties that some, mostly they actually sell it, resell it to the fabric manufacturers to make it yarn from that part but again this in, I mean this is not yet in that level that to look at it okay, so you are not thinking that this was this can be resources at this moment okay.”*

It is observed that some entrepreneurs think that dealing with waste is not profitable and hence they don't deal with it. Similarly, managers are not interested to deal with these waste materials as this may divert their main managerial focus. Most of the interviewees said that they provide these waste materials to the third party and third party deals with waste materials. Still some managers and entrepreneurs are not ready to recycle waste materials and make further products.

So, the waste-resource paradox prevail among industries and very little researches have been done to minimize these paradoxes in the context of Bangladesh.

While the waste-resource paradoxes prevail in the economy, however, some entrepreneurs provided very good insights and suggested some strategies regarding how to minimize the tensions between waste-resource paradoxes. One of the most important issues is recycling technology that are not available in the market right now. In one hand, international buyers are creating pressures to use recycle fabrics for garments products, on the other hand, there are very few technologies are available in the market to convert recycle clothes into recycle yarn or fabrics. Similar problems also prevail other industries where entrepreneurs and managers are facing this problem. Further, the investment is a big issue in recycling technology. The investment in recycling technology increases the costs whereas the buyers are not ready to pay these additional costs. For instance, Head of Sustainability of a garment industry (Case Code-18) mention this issue in the following way: “....*initial, the initial contradiction is investment I mean when we were looking at to invest on those things, the initial investment is very high.*”

In addition to the investment, the recycle market and the eco-system not yet developed in the context of Bangladesh and hence it causes lots of confusions and tensions among the entrepreneurs and managers. The figure-1, depicts both waste-resource paradoxes and tensions and provide a summary of these tensions in a lucid way. Further, based on the interview, authors provided the common strategies that those interviewees indicated in their interviews. The common strategies are; providing right technologies, tax benefits for recycling industries, government and stakeholders supports, ease of waste collections and classification. The following **figure 2**. summarizes the waste-resource paradoxes.



**Figure 2. Waste-Resource Paradox.**

According to the principal scientist of Waste Management Company (Case Code-23), there exists a paradox in the management of daily waste within municipalities. While municipal authorities acknowledge waste as a significant issue, they are hesitant to entrust its management to private companies. This reluctance stems from the fact that waste collection has become a lucrative enterprise in all municipalities, with intermediaries collecting fees from households for waste collection services. These intermediaries are disinclined to relinquish this source of income. Consequently, this poses a challenge for waste management companies as they encounter difficulty in accessing the necessary volume of waste for efficient management practices. In an interview, the principal scientist remarked that this dynamic presents a complex obstacle to effective waste management strategies.

“So, in that case there's a biggest problem for us to collect this thing from any municipality, or yes, from municipality to collect. This thing is very important. This. This is the biggest challenge that how you can collect the Waste from them.”

### 3.4.2 Market Paradoxes

Market demand leads to productions and operations paradoxes also leads to tension between price and quality. Through the interview, it is evident that entrepreneurs are facing a great paradox in market demand at the same time it creates tensions between productions and operations. The growing concern on climate change and environmental degradation pushes the market for sustainable and recycle products. Therefore, buyers specially, international buyers are looking for recycle products. However, the producers are not ready to supply recycle products according to the buyers' needs. It is because the raw materials for recycle products are scarce in the market and suppliers fail to supply recycled raw materials. The tensions in this case brings both opportunities and obstacles for the entrepreneurs. For instance, it is opportunity for the entrepreneurs if they can provide recycled materials in their products and hence it will provide them competitive advantages. However, quality recycled raw materials are not available in the market. This is the contradiction that entrepreneurs are now facing.

On one hand, because of growing market demands, entrepreneurs and facing productions and operations tensions. Productions and operations lead to technology and investment tensions. For instance, to produce recycled products they need appropriate technologies that are not available in the market. Very few technologies are there and entrepreneurs need huge investment to install those technologies. Moreover, quality raw materials are not available in the market that creates obstacles in the production of recycled products. Although recycled raw

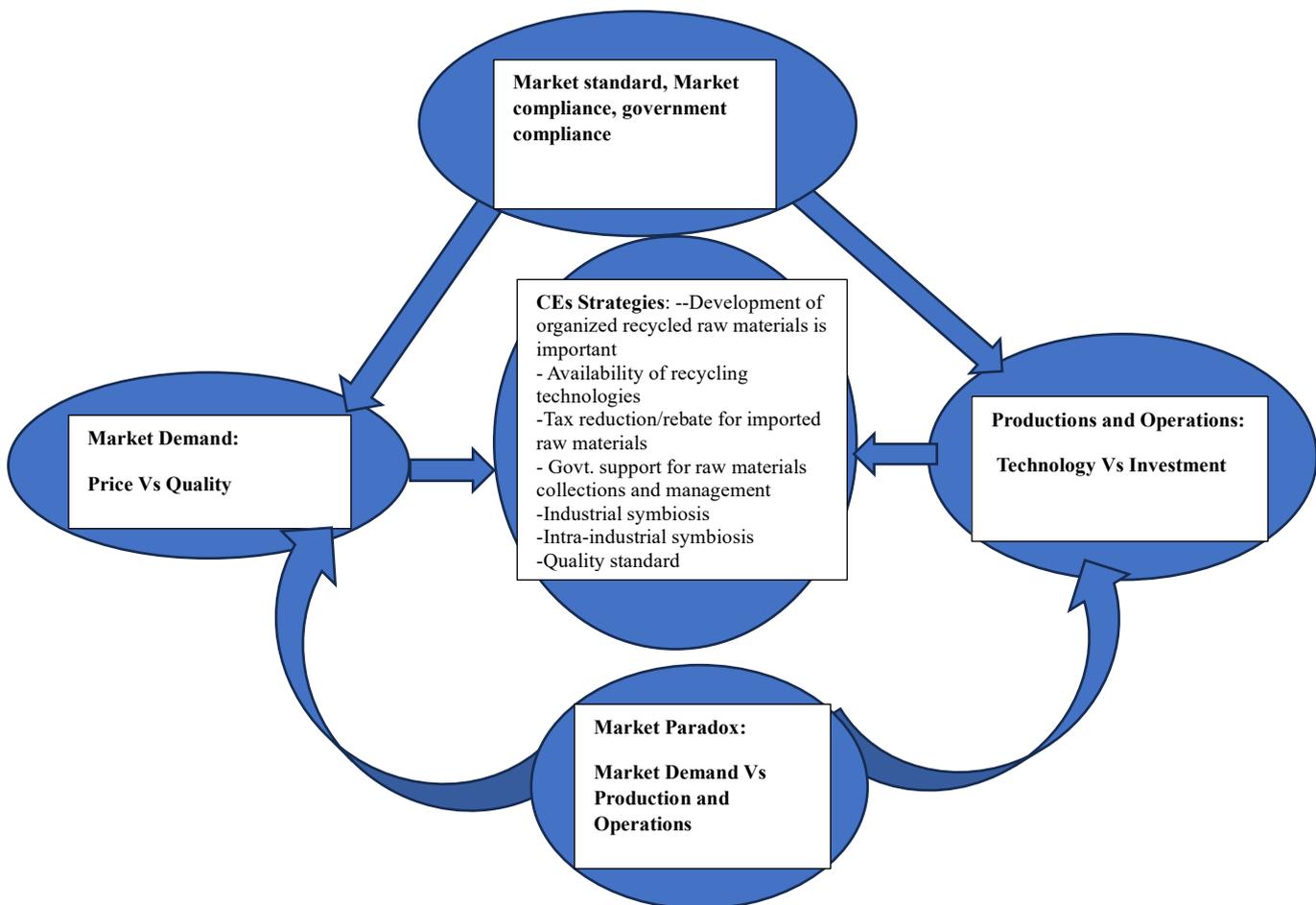
materials can reduce costs and can provide competitive advantages in the international market, however, recycled raw materials suppliers are scarce in the market. Furthermore, recycled raw materials can compromise the quality of the products. For example, in case of plastic recycling, if a producer produces 100% recycled plastic products, then the quality of the product become low which customer will not buy. In this case, producer mix the virgin plastics with recycle plastics to keep the quality up to the mark. In case of garments industries, entrepreneurs opined that recycle cottons are less quality than the virgin cotton. This recycled cotton can't match with the speed of the machine. The spinning rate of the machine is higher which recycled cotton can't keep pace with the machine speed. This cause operations disruptions and production managers yet to find any sustainable solutions to overcome this problem. Another problem mentioned by the interviewee is mix color of garments product. It is almost impossible to separate the mix color from the recycle products and hence impossible to recycle in traditional machines.

According to an entrepreneur of a garment industry who is also industry leader and pioneer in the garment business of Bangladesh, with more than 40 years of experiences (Case Code-2) indicated technological paradox in the following way: *“I have to make a cloth cover. I can't do polyester mix here. No, I can't do polyester, I can't do it in cotton. I have to use cotton Okay, Now I have to do color separation Because, If I mix now, the thread I have It doesn't have one color. The thread I have is not the same color, I have 10 different colors, mix it up. Totally there, if I say a blue, there are 30 different colors in a blue, Under the blue? Under the blue, you see, you have your own blue shirt, I bought different ones Some are light, some are deep, some are navy, some are crystal See, we have to separate the red and blue Otherwise, when I make cotton into thread, my thread will be multi-colored. Nobody will like it.” So, color separation is a big problem in garment's recycled products.*

It is clear from the interview that separation of color in case of recycle garments clothes is a difficult problem. Moreover, it is also difficult to adjust the machine with the recycle products. This situation creates contradictions and paradox among entrepreneurs whether they will go for circular economy or not.

Market demand related to two important tensions such as price and quality. The tensions mountain between these two when buyers want quality recycled products at the same time, they don't want to provide prices for that. These tensions exist across the industries, specially in the garment industries. Head of sustainability (Case Code-18) indicated this issue in the following way, *“One thing is availability of resources. The other thing is if the, whatever available is, the pressure of prices, I mean it's both way. It's in terms of investment, it's in terms of earning. Because the pressure is that massive that we are every year by year, prices are increasing, but the pressure is how we can sell it in less price than last year. This is the biggest pressure what we can feel. Contradictions, that means that they would like, buyers would like to have recycled product at the same time they reduce the price.”*

The following figure 3. summarizes the market paradoxes.



**Figure 3. Market Paradox.**

## Market Standard

International standard leads to technology paradox specially garments manufacturing industries. International buyers now-a-days moving towards sustainable production and consumption. For branding their products in international market and to be competitive in the market they require to adopt circular economy principle in productions and operations. To maintain sustainability in their production and distribution, companies are establishing their standard that ensure circularity and sustainability. Manufacturing companies those who fail to maintain these international standards, become less competitive and in sever cases go out of the market. For pharmaceutical industries they have their Pharma Standard and standard provided by World Health Organization (WHO) and also they maintain government standard to produce and distribute drugs. Head of quality control of a Pharmaceutical Industry (Case Code-13) explain the standard in the following way: *“We are following the some of the regulatory guideline, which are MHRAM, and W. H. O, Guide Line, and also the ICS Guide Line. So, W. H. O Is the one of the biggest one of the biggest guidelines that we are following in the Pharma industry. And there are another 2 guidelines, the which is called the British Pharma Copia, and you. It is a United states Pharma Copia. we are following those guidelines, and this Guide mentioned and product test method.”*

It is sometimes confusing for managers and entrepreneurs that which compliance they will maintain because they need to balance both market compliance guided by national or international buyers, on the other hand, they need to comply with government compliance. Make a tradeoff between both market compliance and government compliance is costly for any firms. It is because for every standard and compliance there is a separate setting for technologies and administration that increase the product costs.

Other industries maintain several national and international standards to maintain quality. For Bangladeshi companies, Bangladesh Standards and Testing Institution (BSTI) is the epic organization to set the standard of the products and almost all the companies need this certification for production and distribution of the products. Majority of international standards do not consider national perspectives while they impose those standards. For example, Bangladesh is a developing country and technologically backward country in the world. However, to adopt circular economy it needs sophisticated technologies which are not available in the country. Moreover, lack of skilled manpower the industries cannot adopt high technology-based production. The tensions between international standard and local market is that international buyers want recycled products, however local manufacturers have less capacity to produce recycle products and less capable to adopt international standard. Although technological adoption provides competitive edge but it requires huge investment. One of the most important paradoxes is that while a standard already adopted by a firm after few days new standard emerge and old establishment of machineries become obsolete. These frequent changes of standards cause huge dissatisfaction among managers and entrepreneurs. For example, Head of Sustainability of a garment industry (Case Code-18) expressed the frustration in the following way: *“In the first phase you want to be the **pioneer on that once you finish that the parameter got changed, because even the industry don't know what they want. You have to get this certification first. You have to get those certifications first and that's where it has been a challenge that I already invested something, and all this gone ruined. Then I have to reinvest again. And then again, when we did it. Then other recommendation came. Even there are a lot of mistakes. So, these are the challenges of actually, whenever something new came to adopting in the first phase. This is, I am telling. It's the bitter experience what we had.**”*

This statement clearly shows the tension within the management and organization that CE or sustainability issues give enterprises or entrepreneurs a huge dilemma and make the situation paradoxically complex, complicated and contradictory. Authors have observed that the frustration among the entrepreneurs and top-level executives regarding frequent changes of environmental standard and bringing new concepts as they have already invested huge amount of capital and machineries to maintain the standard. Some entrepreneurs and managers also mention that the technologies are import dependent that increase the cost and reduce the profit. Entrepreneurs want buyers support in adopting technologies and move towards circularity and sustainability. For avoiding this contradictory situation, entrepreneurs suggest some strategies such as adoption of recycling technologies, maintaining national and international standard, tax reduction or exemption for imported technologies, ease of international business.

### 3.4.3. Stakeholder and Investment Paradox

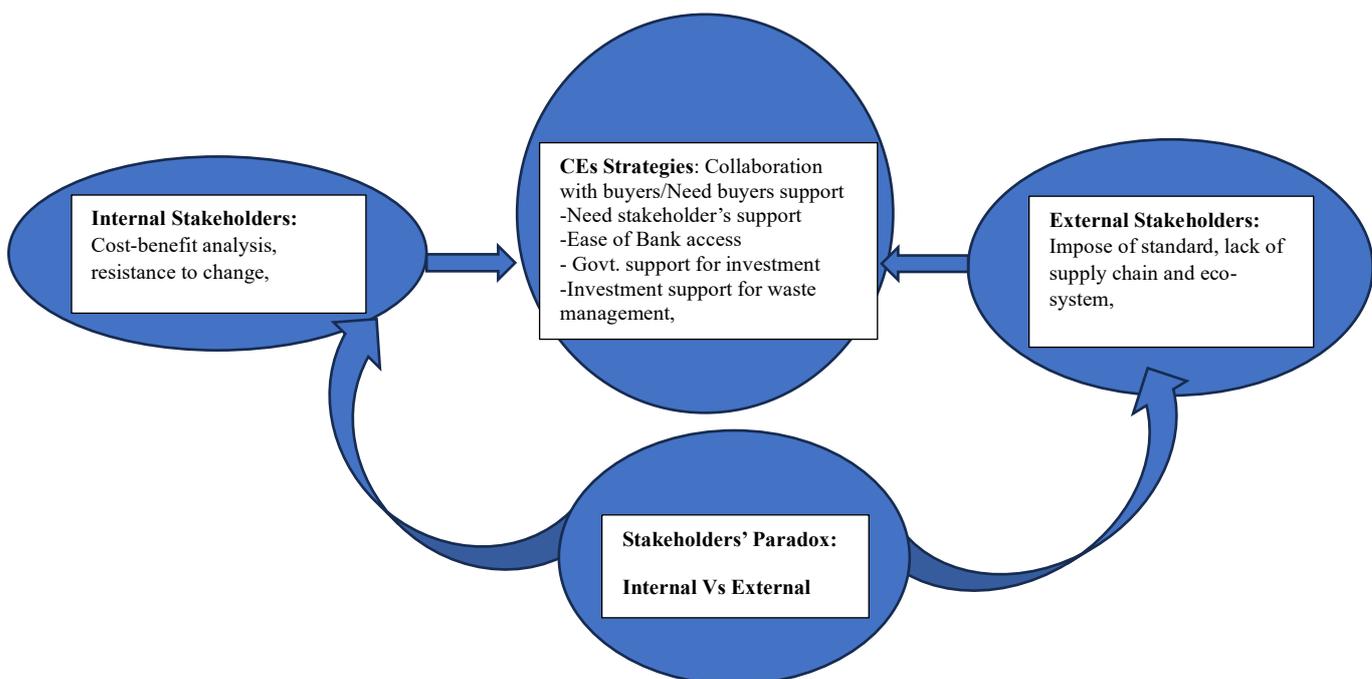
Stakeholders are vital for organizations and the involvement of stakeholders in adopting circularity is crucial for any organizations. Organizations need to work with different stakeholders such as suppliers, customers, non-government organizations (NGOs), government officials, international buyers, business organizations such as federation of Chambers and Commerce and Industries (FBCCI), Bangladesh Garments Manufacturer and Exporter Association (BGMEA), Bangladesh Knit-wear Manufacturer Association (BKMEA), professional organizations such as institution of engineers of Bangladesh (IEB). Both internal and external stakeholders influence the decision on CE. Stakeholders can create a congenial environment for circular business and can support the eco-system for CE. While the growing climate change concern is mounting among stakeholders and in the market, hence the pressures

from stakeholders are increase day-by-day to the firms to adopt CE principles. Companies are bound to listen stakeholders concern regarding productions and distributions of their products. From the head of Sustainability Manager of a garment industry (Case Code-3)), provided notion how stakeholders help their industry as, *“I think, industry owner and the stakeholder, like BGMEA, BKMEA, the government is working that is development on Man made Fiber, because right now the almost more than 50% is sourcing is man-made Fiber. So, that part is still. We are a little behind.”*

Although stakeholders’ pressures provide some directions to the company to adopt circularity, however, sometimes they create obstacles for firms. For instance, although companies are ready to implement new technologies, however, customers are not ready to change their behavior. Sometimes they resist to change and not willing to provide appropriate prices for the product. This paradox and tension prevail in the market and very difficult to change. In this ever-changing situation, the expectations of stakeholders are high that leads to investment tensions among managers and entrepreneurs. Frequent change of stakeholders’ taste and preference force firms to invest on new technologies that increase ultimate business costs. Most importantly, entrepreneurs and sustainable managers argue that they have limited access to finance and financial institutions. Low costs financing is rare in the context of Bangladesh which hinder their investment in new technologies. For instance, in the same interview from Case Code-3, head of sustainability manager mentioned, *“I think, **one big challenge that all the industry owners and the people, and the various stakeholder they are not, they are not very clear pictures or documents on information is available.** That will what they can take or I'll give it for the for the transformation, ultimate for the circularity. What they should do? So, **information and availability of the information, and also an of the right technology.** Also, the **financial and green finance unavailability of green financing with the low cost financing, ...”***

To mitigate these tensions, stakeholders suggest that a collaboration between firms and stakeholders is needed. Moreover, ease of bank financing specially, green financing, government support for capital machines, buyers support for technologies are vital in this regard. The following figure 4. Summarizes the stakeholders' paradoxes.

### Stakeholders' Paradox:



**Figure 3. Stakeholders' Paradox**

## 3.5 Discussion

### 3.5.1 Waste-Resource Paradoxes and Strategies for Minimizing tensions

Based on the Paradoxical theory (Smith and Lewis, 2011), authors combines the critical paradoxes and tension while adopting CE. The first paradox in CE is whether circular entrepreneurs consider waste as resources or not. Findings clearly show that majority of the entrepreneurs and managers are not ready to deal with waste materials and they found it as worthless resources. Most of the managers provide these wastages to the third party for further recycling or sell those with minimal prices. Although Zucchella and Previtali (2019), explained how the municipalities convert their ‘worthless’ waste into valuable products, however, entrepreneurs and managers are not ready to deal with this at this moment. However, buyers pressure and international compliances compel them to adopt CE principles and entrepreneurs have started now thinking how to convert their waste into resources. Greer et al. (2021) found that waste-resource paradoxes are understudied and reasoned that building awareness on this issue is crucial for moving toward circularity. In our findings, we also found that very few awareness exists in the market regarding waste and misconception prevail that hinder conversion of wastage into resources. Most importantly, we developed waste-resource paradox considering critical element of Paradoxical theory. One of the critical elements of Paradox is learning paradox where it calls for an innovative environment that help transition to circularity by exploration and exploitation of CE principles for building new phenomenon (Smith and Lewis, 2011). Transitioning towards CE, circular entrepreneurs need to learn innovative way to convert their waste into resources. Moreover, entrepreneurs need to apply some strategies to reduce the tension between waste-resource such as employment of recycling technologies ( Kang et al., 2023; Krauklis et al., 2021), tax rebate for green technologies (Krass et al., 2013;

Chang et al., 2022), government support for recycling technologies (Lyu et al., 2022; Taghipour et al., 2022), waste transformation or waste management (Hajam et al., 2023; Moh, 2017).

Referring to our main research question, “What are the main paradoxes and tensions that circular entrepreneurs are facing in adopting CE principles in their productions and operations?”, at this stage we argue that entrepreneurs must consider waste as resource and find a way to convert waste into valuable resources. This will significantly minimize the tension between waste-resource paradoxes (research question 1). In the waste-resource paradox, the main tension is that whether entrepreneurs consider waste is a problem or waste is resource? After considering waste as resources, entrepreneurs need to decide whether they recycle it or not? For recycling waste materials, entrepreneurs need to take R-Strategies (reduce, recycle and reuse including refurbishing, remanufacturing). R-strategies are the key to move toward CE and entrepreneurs need take required actions to adopt those strategies (Campbell-Johnston et al., 2020).

***Market Paradoxes and strategies in dealing with Market Demand, Productions and Operations, International Standard***

To address the main objective and the research question authors integrate market paradoxes including market demand, productions and operations, and international or market standards. As we discussed market demand deals with two major paradoxes, i.e., quality and prices. The authors observe that there is an inverse relationship between these two important market elements. Although it is common that quality products demand more prices, however, in recycling context buyers are not ready to pay higher prices. Buyers want quality products that must contain recycled raw materials; however, manufacturer fail to provide quality products when they mix recycled materials with virgin materials (Reike et al., 2018). Some researchers agreed that in recycling process materials, specially, metals loss it’s quality while recycle it

(Reike et al., 2028). This creates a great dilemma and contradiction among buyers and manufacturers. To reduce these tensions, we suggest that entrepreneurs must develop ecosystem for industrial symbiosis (IS). IS will provide quality raw materials for recycling industries and can build a cooperative industrial environment where quality raw materials would be available (Daddi et al., 2019; Dagilienė et al., 2023; Vence et al., 2022). Further, banks and financial institutions must provide low cost green financing for recycling technologies. In this context, firms involve in organizing paradoxes where firms need to re-structure its business to adopt with CE through adopting technologies (Smith and Lewis, 2011). Market paradoxes also deal with production and operations paradoxes where entrepreneurs face tensions between technology and investment. These are the two vital elements of market paradoxes always being prime consideration to transform to the CE. One of the successful entrepreneur's comments on technology as:

‘So initial base level technology for setting up effluent treatment plants are there but the global standard top of line technologies that exist I don't think they still have penetrated into Bangladesh yet. Sometimes those technologies are also much more expensive than what entrepreneurs can afford. This is where there is a need for financing at a very, you know, available rate to the entrepreneurs if they want to undertake such initiatives or want to introduce such technologies into their factories. Financing is a big impediment also.’

From the comments it is evident that although basic level technology is available but real recycling technology is absent till now to transform to or transition to CE.

While the technologies are expensive for recycling business that also hinder the investment and also operation process, some managers suggest to improve efficiency as there are no other alternatives in hand. This strategy, i.e., improving efficiency will reduce the tensions between technology and investment. For instance, one of the interviewees from steel manufacturing

firm (Case Code-17) who is also chief people officer (CPO), rightly address that improving efficiency with CE is the option they have to compete in the market and they don't have any other option in hand. The fact is that in steel industry almost all the competitors have the same source of raw materials in Bangladesh and the price competition is very high. So, improving efficiency is crucial in this case. According to the CPO of a steel company:

*'You cannot do anything with the raw material prices, because you don't have any options. All the things you have you can do by increasing the efficiency by using the materials, and using again and again by circulating our materials as much as possible, and we can use the value out of it again and again...'*

### 3.5.2 International Standard: Government Compliance and International Compliance

Entrepreneurs minimize market paradoxes (research question 2) integrating technology, investment and international standards for CE (Ávila-Gutiérrez et al., 2019). International standards that also indicated by combining government compliance and market compliance are crucial to survive in the market and in the competition in the context of CE. Most of the respondents show dissatisfaction regarding frequent change of international standard. Moreover, different international buyers provide different parameters and standards that increase the investment and hinder the smooth operations of the business. Although lack of uniformity of standards exist in the market entrepreneurs are willing to comply those standard, however international buyers are not willing to pay for these additional costs. This cause further tension and dilemma among entrepreneurs and managers.

The frustration echo from a Head of Sustainability Manager of a garments industry (Case Code-18) and said, *"The challenging part is that you know, it happens sometimes that what it*

*happened with us before as well. Whenever something new is coming, we **immediately start looking to establishing that what the challenges is, you know when you do. In the first phase you want to be the pioneer on that once you finish that the parameter got changed, because even the industry don't know what they want. So that time all of your investment got ruined. Then you have to reinvest again.***”

To mitigate these tensions entrepreneurs must comply with international standard and also align their business operation with government and international compliance. Although the external compliance such as buyers pressures work as double edge sword for circular entrepreneurs. It enables company to change its operations to adopt CE, however, it increases costs and at the same time, entrepreneurs think it is a forceful technique from the international buyers. One of the successful entrepreneur’s comments (Case Code-6) make the circumstances clear:

*‘For example, for our effluent treatment plan that we have in our textile factory, the parameters are very strictly monitored by the inspection and audit of our buyers. So, when that happens, the entire organization realizes that if we do not, you know, fulfill those criteria and meet those standard measures, get delisted from being a supplier. Right. I think that is, you can say it's more of a forced tactic, but I think it is, it works for companies who are in tier one or tier 2. But what about down the chain I don't know how that that would be translated into the other parts of this supply chain.’*

This is a great paradox specially in the textile and garment industries of Bangladesh as to which compliance they will align as there are several of them exist in the market. After Rana Plaza Garment incident in Bangladesh in April 24, 2013 (Barua, and Ansary, 2017), where more than one thousand people died because of poor infrastructure of the factory, international buyer imposed strict compliance, rules and regulations through ACCORD (global factory inspection program for safer work place including trade unions and brands) and ALLIANCE ( 29 Groups

of companies, retailers, and brands of which majority from North America) (Barua, and Ansary, 2017). Many small and medium sized garment factories went out of the business because they fail to maintain the compliance provided by the ACCOR and ALLIANCE. These are the two collaborations of international standard, and Bangladesh government's initiative (Bangladesh ACCORD on Fire and Building Safety) and Bangladesh's ALLIANCE, made lots of positive changes of garments industries of Bangladesh which supported by international labor organization (ILO).

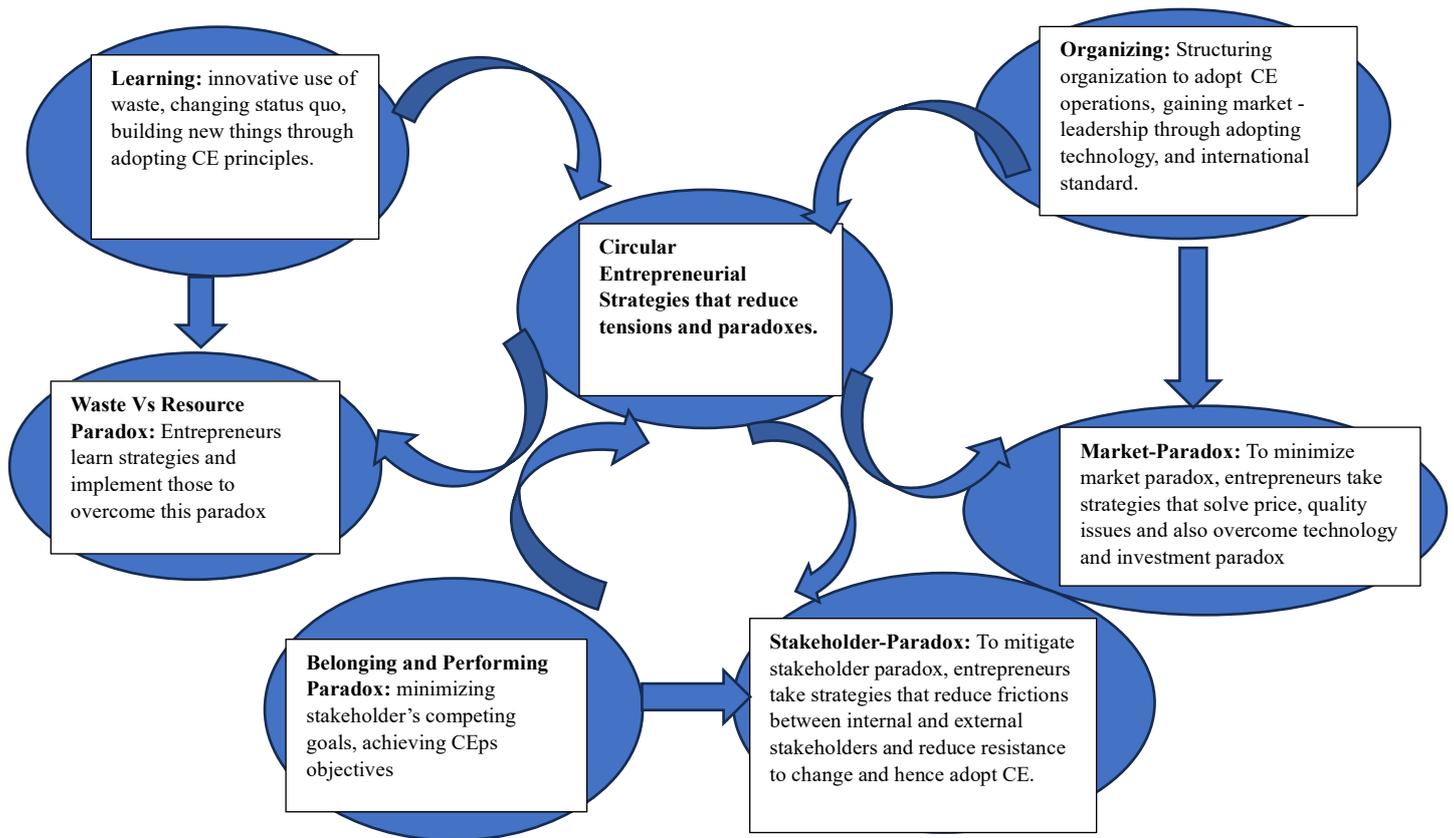
Although these rules and regulations also create some opportunities, however, recent sustainability issues also imposed by the buyers and carbon emissions issues further puzzled entrepreneurs whether which one they will follow. Throughout the face-to-face and online interviews, researchers found a lot of contradictions and paradox that need to be resolved before implementing any concept of CE. Minimizing this paradox fall into organizing paradox as firms are mitigating their compliance issue through innovation, re-structuring and technology adoption. At this stage, authors suggest that companies need to align its internal strategies that align with external compliance and hence to move toward circularity and sustainability.

### 3.5.3 Stakeholders' Paradoxes and Strategies to Mitigate Tensions

Stakeholders are crucial in transforming linear economy to a CE. Collaboration with buyers, suppliers, government and non-government actors propel this transformation process. Stakeholders are the important investors of the company along with supply chain actors and industry association that support the growth of the firm. Any sorts of reformation or transformation must be supported by stakeholders where adopting CE principles are not an exception (Van et al., 2021). Our findings support previous scholarship and we explain that circular entrepreneurs need support from supply chain (Van et al., 2021), support from

government (Wasserbaur et al., 2022), access into financial institutions and banks (Chen & Eweje, 2022; Saarinen and Stenroos, 2023), support from industry associations (Ormazabal et al., 2018). However, tensions emerge when internal and external stakeholders are not aligned in adopting CE principles, although they are integral part of this transformation process (Mies and Gold, 2021; Rincón-Moreno et al., 2021). While the internal stakeholders are more focus on financial and economic gain, external stakeholders are concern regarding environmental and climate change issues. This opposite stance between these two groups brings paradoxes among entrepreneurs. To mitigate this problem entrepreneurs must take strategies that reduce the resistance to change between internal and external stakeholders. We suggest that internal stakeholders need to be more educated in environmental issues (Qu et al., 2020) and also need to be taken into consideration while making policies and necessary to take actions for sustainable production and operation policies. We found that supply chain eco-system not yet develop in the developing country like Bangladesh and entrepreneurs are suffering for lack of recycled raw materials and lack of available supply for recycle products. Import dependent supply chain is a great impediment in transitioning toward CE. Government should provide tax reduction and financial facilities to reach broader circular supply chain. Hence, we suggest that supply chain collaboration needs to ensure while transitioning towards circularity and sustainability (Berardi and Brito, 2021). Although Berardi and Brito (2021) suggested for collaborations among firms, however, we suggest for a complete and wholistic collaboration from all stakeholders for gaining competitive advantage and for transitioning towards CE. Based on the findings and discussions we developed the following macro-model that provides all paradoxes that encounter by circular entrepreneurs while transitioning from linear economy to CE.

## Macro-model or Overall Paradox:



**Figure 4. The Framework: Mitigating Paradoxes.**

The macro model shows the interactions between circular entrepreneurship paradoxes and how circular entrepreneurs minimise these paradoxes using component of paradoxical theory. The model's pivotal point is circular entrepreneurship that integrates learning organising, belonging and performing paradoxes with waste-resource paradoxes, market paradoxes, and stakeholder paradoxes. Referring to the previous micro-models where each of the paradoxes provide specific circular entrepreneurs strategies, however, in the marco-model we combine all these paradoxes with paradoxical element and navigating how circular entrepreneurs interact and minimise those paradoxes. For example, the first paradox circular entrepreneurs face whether they will treat waste as resources or not. This paradox leads circular entrepreneurs to break their status quo and find innovative use of waste, build new process to adopt CE principles.

Learning paradoxes help entrepreneurs to innovate new ideas to deal with waste and convert it to resources.

Similarly, circular entrepreneurs face market paradoxes and market paradoxes interact with other elements of paradoxes. For example, to deal with market paradoxes, circular entrepreneurs use organising elements of paradoxical theory where circular entrepreneurs structure their organisation to adopt CE principles, gain market leadership by complying national and international standards. Market paradoxes have also relationships with other paradoxes and elements of the paradoxical theory. In the same token, stakeholder paradoxes interact both belonging and performing where stakeholders minimise contradictory goals, transitioning towards CE and together they achieve sustainability objectives. Each of the circular paradoxes interact with other elements of paradoxical theory and circular entrepreneurs find a way to solve organisational problems addressing CE issues by using CE principles.

### 3.6 Theoretical and Managerial Implications

The current research has contributed in CE literatures specific reference to emerging economy context Bangladesh. For instance, the research empirically shows how entrepreneurs in an emerging country can adopt CE principles considering crucial organizational and managerial factors such as waste management, market factors and stakeholders' factors. The research also contributes significantly through a lens of Paradoxical Theory and show how entrepreneurs can minimize and mitigate some tensions exist in organizations. Very few previous research highlights this tension in the context of CE. Previous management and entrepreneurship research highlight CE in the context of business model, circular product design, circular supply chain, however, they rarely focus contradictions among various factors that contribute in the transition to CE. The current research contributes and fills this gap significantly and show the strategies how entrepreneurs can minimize tension by adopting some circular strategies. The extant managerial and entrepreneurial research didn't highlight the issues of resource tensions

and mostly discuss waste management in different context. However, this research provides a fresh look regarding resource tensions and provide strategies that will help managers to take appropriate strategies by minimizing tensions. In this case, managers must overcome the status quo regarding waste management and need to consider waste as resources rather than a problem. Moreover, managers and policy makers must break their inertia regarding market paradoxes and emphasize more in investing in circular products. Furthermore, this paper incites in building awareness among stakeholders and overcome the tensions related to CE paradoxes. Stakeholder's paradox in investment and technology adoption also highlighted and recommended that these tensions can be minimized through adopting better technologies. Government and other stakeholders can provide a congenial environment for entrepreneurs to move towards circularity and sustainability. Policy makers also need to come forward to provide policy support in this transition process and make easy policy for imported recycled and sustainable raw materials that will help entrepreneurs to transform into a CE.

### 3.7 Limitations of the Study

The current paper provides valuable acumens for entrepreneurs, managers, and policy makers regarding transition to CE and its paradoxes, however, the paper has some limitations as well. The study is limited to qualitative study and larger sample could provide more insights regarding adoption of CE in the context of Bangladesh. Although authors minimize this limitation by following multi-methods in qualitative study and didn't confine only interview method. In addition to interview, authors observe the field study by visiting factories and travel from the UK to Bangladesh, observing real practices of CE in the factories in different region of the country, cross-checking the facts through triangulations.

### 3.8 Future Research Directions

The topic of CE is a nascent field in the context of Bangladesh and there are lots of avenues for future research because it is also an emerging issue for the developing country. Till now very few research has been done on the issue of CE based on paradoxical theory. Future researchers can look at the issue through other theoretical lenses. So far, our literature search and understanding future researchers can significantly contribute in CE research because it is still less focus research in the context of Bangladesh. In this research, we emphasized resource paradoxes, market paradoxes, investment paradoxes, and stakeholders' paradoxes, however future research can identify other paradoxes that the current research didn't mention.

Another dimension of research can be done through examining different contextual variables such as demographic, economic, political and find their mediating and moderating impact on CE adoption at firm levels. These mediating and moderating perspective of CE research would bring a new, fresh research agenda and would be interesting as the field is still under studied in this research stream. This could enhance our understanding of CE adoption in more comprehensive way. Although the paper focuses on the most significant issues of paradoxes, however, future researcher can focus more on strategies and tools that mitigate paradoxes and can provide policy implications in transitioning towards CE.

The direction of the current research is focused on some policy framework in CE adoption however, further research can focus more on policy issues such as how policy change impact the CE adoption, or what would be government specific policy that will help the transition of CE, or how the entrepreneurs can take internal policies that can align their strategies to fit the external policy changes. In the context of emerging economy like Bangladesh, very few researches have been done at policy level of CE transition. Government and department of

environment or department of industry not yet place any policy regarding CE adoption and not yet provide any road map toward transition to CE. Furthermore, the institutional roles are important in CE transition and future researchers can look into CE transition through institutional lens. Currently, industrial symbiosis and ecosystem for CE almost absent in the context of Bangladesh. Entrepreneurs have huge opportunities to explore and exploit the market to develop circular ecosystem and to build inter and intra industrial symbiosis and circular ecosystem in Bangladesh.

### 3.9 Conclusions

The transition from linear economy to CE is not an easy journey and organizations are just sailing their ship into this journey. As the journey just begin, many misconceptions, tensions, contradictions and paradoxes emerge regarding CE adoptions. However, unanimously the world is suffering from environmental degradation and continuous global warming, sea level rise, climate change are the evidences that need to take into account. Man-made and linear production system pose a threat to the bio-diversity and the existence of human being is now a big question. To overcome this situation, production and operation must be sustainable and the world has not time to wait in implementing circularity in their operations. Adoption of CE can solve those problems to a large extent and hence managers, entrepreneurs, policy makers need to overcome all sorts of tensions in this transition journey. So that we can ensure a better world for the next generations. For doing this, entrepreneurs, managers, government and non-government stakeholders need to participate in this journey. The current research finds some important contradictions while implementing CE principles and circular entrepreneurs are facing tensions in adopting CE. Authors identifies most pressing tensions while collecting empirical data and divided all those tensions into some categories to answer the research questions. In transition to CE, circular entrepreneurs first face whether they will consider waste

as resources or not. This resource paradoxes between waste-resource tensions solved by taking some strategies that will guide entrepreneurs to minimize these tensions. To become circular entrepreneurs, traditional entrepreneurs have to deal with this initial hurdle for smooth transitioning into CE.

Correspondingly, our research also identifies most significant paradoxes in CE adoption such as market paradoxes, investment paradoxes, and stakeholder paradoxes. Market paradoxes are vital because the current market failure in mitigating climate change leads to CE transformation rather than twig with linear economy and hence entrepreneurs need to explore and exploit market opportunities in the new reality. Technology paradoxes are the key drivers to implement the CE principles. Without having right technologies, it is almost difficult to change the product design and move to CE. All interviewees indicated this paradox and urged to solve this technological paradox at first. However, to install new technologies, entrepreneurs need investment which is also another prime consideration we found in transition towards circularity. Entrepreneurs from emerging economies consider technological change as costly and they don't feel interest in investing new technologies. They always want short-term gain and hence, forego long-term benefit. Investing in CE principles is a long-term game. Finally, stakeholders' paradoxes pose very important tension in CE transitions. In this case, both internal and external stakeholders need to work together. We suggest some strategies and show how to mitigate those tensions.

## Chapter Four

### 4.0 Achieving Competitive Advantage and Minimizing Tensions in Adopting CE Through Circular Entrepreneurship: A Dynamic Capability Lens

#### Abstract

The circular economy (CE) is increasingly recognised as a critical tool for achieving sustainability goals and addressing global challenges such as climate change and global warming. Transitioning from linear production and consumption models to circular and closed-loop processes requires the support of circular entrepreneurship. However, research on circular entrepreneurship has received limited scholarly attention, with few studies examining the tensions circular entrepreneurs face and how they develop dynamic capabilities to adopt and transition smoothly to the CE. This study aims to fill this gap by empirically investigating 32 companies in a developing country context, Bangladesh. Through a qualitative approach, semi-structured interviews were conducted with entrepreneurs and top-level managers. The findings indicate that circular entrepreneurs encounter various challenges across market, resource, and stakeholder discourses, and the study explores how they develop dynamic capabilities—specifically sensing, seizing, and transforming—to overcome these challenges and gain a competitive advantage. The paper provides key insights into managerial and policy implications, offering recommendations for future research in the area of circular entrepreneurship and CE transition in DC lens.

## 4.1 Introduction

The world is suffering from serious environmental degradation and climate change. Human-induced climate change is already influencing numerous weather and climate extremes in all regions worldwide. This has resulted in extensive negative impacts and associated losses and damages to both nature and people (Wardhana, and Prawira, 2024). Around 3.3 to 3.6 billion people of the world live in areas that are highly susceptible to the effects of climate change (Wardhana, and Prawira, 2024). To tackle these issues, current literature advocates that CE can solve these environmental problems to a large extent (Gallego-Schmid et al., 2020; Yang et al., 2023; MacArthur and Heading, 2019). The CE marks a significant shift from the traditional 'take-make-dispose' model, advocating for waste minimization, material reuse, and recycling to address climate change (Geissdoerfer et al., 2017; Ghisellini et al., 2016). Hence, CE brings abundant opportunities for entrepreneurs to explore and exploit environmental issues, however, it also brings many environmental and economic tensions, dilemma, and discourses. CE also brings discourses on waste-resource paradox (Greer et al., 2021) socio-ecological challenges (Frianta, et al., 2020), public discourses on traditional products (Kuhlmann et al., 2021), ecological fragility and economic poverty (Cheng et al., 2019), economic value of product life and environmental issues (Ariztia and Araneda, 2022). Circular entrepreneurship can minimize these tensions, dilemma and discourses to a large extend through adoption of CE principles and circular entrepreneurship can work as one of the strategies for transforming a linear economy into a CE (Suchek et al., 2021; Sarabia and Del Val, 2021). Circular entrepreneurship is the “process of exploration and exploitation of opportunities in the domain of CE” (Zucchella and Urban, 2019, p.7). Circular entrepreneurship involves entrepreneurial initiatives that motivate entrepreneurs who capitalise on opportunities within the CE (Cullen and Angelis, 2021). However, research on circular entrepreneurship within the CE domain remains in its infancy,

leading to considerable uncertainty in the transition towards circularity and sustainability. Hence, this study aims to address these gaps and challenges by offering strategies for circular entrepreneurship and demonstrating how circular entrepreneurs gain competitive advantage through DC.

Circular entrepreneurs use circular principles: reduce, reuse, recycle to reduce carbon emissions and to tackle climate change by redesigning existing business models (Cullen and Angelis, 2021). Circular entrepreneurs seek competitive advantage and better firm performance by utilizing DC (Moon, S. and Lee, H., 2021). DC are “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece et al., 1997, p.516). The literature links entrepreneurship with sustainable development (Staicu, 2021; Zhu et al., 2019), sustainable entrepreneurship with education (Del Vecchio et al., 2021), transforming society with circular entrepreneurship (Ili, 2022). However, research linking circular entrepreneurship, minimizing CE tensions and achieving competitive advantage through DC are still missing. Moreover, the research on how circular entrepreneurs can get a competitive advantage through DC is very limited in the context of CE. Hence, the paper's main objective is to empirically identify how circular entrepreneurs can gain competitive advantage through DC and minimize CE tensions in an emerging country like Bangladesh.

Achieving Competitive advantage is becoming difficult because of climate change, and global economic turmoil (Li and Liu, 2014). However, there is a debate on competitive advantage, dynamic capabilities and environmental issues. While some scholars argue that DCs are the prime factor in achieving competitive advantage (Helfat et al., 2007; Teece, 2007; Teece et al., 1997; Li and Liu, 2014), other scholars believe that DCs do not consider multiplicities or heterogeneity and hence do not provide a road map for competitive advantage (Eisenhardt and

Martin, 2000). In CE, DCs can enable organisations to increase firm performance and therefore achieve competitive advantages (Jolink and Niesten, 2015; Prieto-Sandoval et al., 2018). Nonetheless, empirical research on circular entrepreneurship, linking DCs and competitive advantages are not available in the current entrepreneurship scholarships. Hence, the research will minimize this gap to a large extent.

Most of the literature on circular entrepreneur is surrounded with the new business model or circular business model (Guldmann et al., 2020; Zhu et al., 2019; Crecente et al., 2021; Veleva & Bodkin, 2018; Flygansvør et al., 2019; Rodrigues and Franco, 2020; Tetsman, 2017; Despeisse, 2017). Hence, idiosyncratic characteristics of circular entrepreneur dealing with dynamic capabilities and related entrepreneurial studies are lacking in the current literature. Some literature focuses on new business creation or circular startup (Duberg, 2020; De Angelis, 2018; Lauten-Weiss and Ramesohl, 2021; Greer et al., 2020; Zhou and Park, 2021). However, they fail to elicit how circular entrepreneurs transition to CE from linear economy.

Lin et al. (2016) have established a connection between DC and management innovation. In a similar vein, Augier and Teece (2009) have extended this theoretical framework to elucidate the role of managers in shaping strategy and business performance. Lee and Kelley (2008) have further expanded upon dynamic capability theory by linking it to management and entrepreneurial practices, investigating deeper into its implications for organisational performance. Wilden et al. (2013) have investigated the interplay between dynamic capabilities theory, organisational structure, environmental factors, and strategic considerations. de Arroyabe et al. (2021) have also integrated circular dynamic capabilities with the core dynamic capabilities theory. Meanwhile, Khan et al. (2021) have emphasised the pivotal role of vital organisational capabilities and routines within the dynamic capabilities framework. All these studies show a considerable research gap on Circular entrepreneurship and do not provide

information on how circular entrepreneurs can explore and exploit CE opportunities and move towards circularity and sustainability.

Furthermore, the existing body of research has yet to explicitly address the significance of DC in circular entrepreneurship or provide empirical substantiation on how circular entrepreneurs can acquire competitive advantage. Thus, this research gap derives the **main research question** of the paper: How can the circular entrepreneurs gain competitive advantages, minimizing CE tensions through sensing, seizing, and transforming the organisational resources in the realm of CE? In pursuit of answering this research question, the authors leverage empirical data collected from a diverse range of industries and conduct interviews with entrepreneurs actively engaged in circular practices. The findings elucidate how circular entrepreneurs, corporate entrepreneurs, and top executives can indeed acquire competitive advantages in the context of emerging economy of Bangladesh. This contribution is the central thrust of the current paper, addressing a notable gap in the existing literature on circular entrepreneurship

The present paper significantly contributes to the literature on circular entrepreneur and the entrepreneurship field. **First**, the paper uses DCs lens to provide entrepreneurs insights regarding market reality, changing market environment because of CE, and resource awareness through sensing. So, in this paper, researchers integrated the concept of circular entrepreneurship with DC and looked empirically how circular entrepreneur achieve DCs. In this context, researchers identify major market discourses through market scanning and sensing and also researcher show how market sensing lead to market seizing.

Secondly, as researcher discussed in the previous chapter (Paper 2), entrepreneurs are in a paradox while seizing the opportunities in CE because of tensions brought by different stakeholders. So, in this chapter, we look into how circular entrepreneurs minimise tensions and seize opportunities through the DC lens. At this stage, researchers contributed by

elucidating resource discourses that grossly overlooked previous studies and show how this discourse motivate circular entrepreneurs to achieve dynamic capabilities and move to transformation process.

Thirdly, transforming organisations into circular ones is a significant challenge for any organization as it requires resource reconfiguration and aligning existing resources with CE strategies. Hence, we contributed to the DC literature by showing how circular entrepreneurs transform their organisations to adopt CE principles and gain competitive advantages. Current literature yet to address this transforming process in the context of circular entrepreneurship.

**Finally**, most literature on circular entrepreneurship and related fields is conceptual and descriptive (Cao, 2011). Therefore, more qualitative and in-depth research and company case studies will add a theoretical foundation to the existing body of knowledge. Our empirical research on circular entrepreneur with dynamic capabilities theory also fills this gap.

The paper is organised as follows: After the introduction, the paper provides a literature review, followed by the methodology, findings, discussion, managerial implications, policy implications, theoretical contributions, conclusions, limitations, and future research directions.

## 4.2 Rationale of Using Dynamic Capability Theory.

Teece et al. (1997), opined that opportunities can be sensed and seized by reconfiguring the company's resources to boost performance through achieving dynamic capabilities. *Dynamic capabilities* help companies perform and sustain themselves in the long run (Wilden et al., 2013). In other words, dynamic capabilities are the firm's ability to consider environmental change by integrating and changing the company's resources (McKelvie & Davidsson, 2009). By the same token, dynamic capabilities are also considered 'high-order' capabilities that help

organizations utilize their technological possibilities to gain a competitive advantage by distributing their resources to meet customers' needs (David et al., 2015).

Based on the empirical study, Wilden et al. (2013) showed that dynamic capabilities depend on market competitiveness and organizational structure. In the case of organizational structure, 'organic organizational structures' positively impact achieving dynamic capabilities and, hence, on performance (Wilden et al., 2013). Similarly, competitive intensity impacts a firm's performance, and organizational structure aligns internally with dynamic capabilities to achieve better performance by considering and integrating external factors (Wilden et al., 2013).

Research also confirms that new product development is one type of dynamic capability that requires technological innovation (McKelvie and Davidsson, 2009). McKelvie and Davidsson (2009) investigated four types of dynamic capabilities (i.e., "idea generation capabilities, market disruptiveness capabilities, new product capabilities, and new process development capabilities") for new firms that are also relevant to circular entrepreneur or new startups in CE. All four dynamic capabilities are linked with technological development, which creates opportunities for entrepreneurs.

#### 4.2.1 Sensing the Opportunities

**The first step** of dynamic capabilities theory is to **sense opportunities** by detecting technological development and identifying new technological possibilities from CE perspectives. Sensing also includes perusing or scanning the business environment, understanding and listening to customers, and exploring technological possibilities (Teece, 2014). Sensing involves cooperation from all managerial levels and also transferring an entrepreneurial mindset to all functional areas of an organization (Teece, 2014).

The short-term performance of a firm does not confirm its sustainability; it may be due to its 'strong ordinary capabilities', meaning short-term technical fit or operational success (Teece, 2014). However, the real challenge faced by organizations is when there is a rapid change in technology and organizations face intense competition (Teece, 2014). For a CE, science and technology are key components (Geng and Doberstein, 2008) that bring economic and technological possibilities. Technological possibilities can be created from the new scientific field, such as cleaner production, eco-design, life cycle assessment, information technology, material science and biotechnology (Geng and Doberstein, 2008). All these technological possibilities are also related to the fourth industrial revolution (I4.0). I4.0 is the 'digital transformation' of productions and distributions adopted by current societies, leading to ecological conversion and environmental protection related to CE (Caiado, 2024). The driving forces of I4.0 are information and communication technologies (ICT), the Internet of thing (IoT), big data, industrial automation or robotics productions, simulations, cyber-security, cloud computing, artificial intelligence (AI), additive manufacturing (Caiado, 2024). All these create technological possibilities that need to be considered in CE adoption.

To develop capabilities and enhance their ability to sense opportunities, managers and entrepreneurs must possess key competencies, including human resource management, knowledge management, decision-making flexibility, and entrepreneurial acumen (Dias et al., 2020). The DC framework emphasises the accrual of entrepreneurial rents to organisations through innovation, as well as the creation and exploitation of new market opportunities (Roundy and Fayard, 2019). Entrepreneurs must also have the ability to reconfigure and transform their resources to secure Schumpeterian rents, which arise from the strategic utilisation of an organisation's assets (Teece et al., 1997). With regard to sensing, entrepreneurs recognise market shifts, opportunities, and perceptions by identifying customer problems and needs (Helfat and Peteraf, 2015; Teece, 2007; Teece, 2014). They detect changes in the market

and environment by monitoring competitors' activities, economic trends, evolving customer preferences, and through engagement in professional associations (Wilden, Gudergan, Nielsen, and Lings, 2013; Roundy and Fayard, 2019).

#### 4.2.2 The Seizing the Opportunities

**The second step** of gaining dynamic capabilities through circular entrepreneur is seizing opportunities created by CE. CE has created many opportunities, and circular entrepreneurs must grasp these opportunities by refining the existing BM, committing resources for Circular entrepreneur, considering competitors' reactions, and utilizing intellectual property through entrepreneurial strategies (Teece, 2018).

##### 4.2.2.1 Refining the Existing Model or Adopting Circular Business Model (CBM)

Generally, a business model (BM) explains the design or road map of how an organization does its business, creates value, and delivers value to the customers (Teece, 2018). Based on the intensive literature review, Frishammar and Parida (2019) provided the following definition of CBM; "A circular business model is one in which a focal company, together with partners, uses innovation to create, capture, and deliver value to improve resource efficiency by extending the lifespan of products and parts, thereby realizing environmental, social, and economic benefits." So, in essence, CBM redesigned the product and created value to eliminate the negative environmental effect (Frishammar and Parida, 2019).

In the new reality of CE, the existing BM needs to be changed to adopt the CE principles. A firm's capabilities influence the design of BM, and dynamic capabilities are the outputs of the execution and transformation of BM (Teece, 2018). To achieve circular dynamic capabilities (CDC), circular entrepreneurs need new types of BM, termed circular BM, where an organization adopts CE principles in its BM. In other words, CBM is the value creation built

on CE principles that contain and retain economic value within products even after use. CBM implies a return flow of economic value from users to producers (Linder and Williander, 2017). CBM needs resource commitment and generally uses R-strategies (reuse, reduce, recycle, remanufacturing, refurbishing, renovation, repairing) for resource commitment.

#### 4.2.2.1 Commit Resources

Circular entrepreneur is the tool that helps organizations integrate their internal resources to align with external factors and achieve dynamic capabilities. Getting dynamic capability in CE perspectives is challenging, and new resource configuration is essential for applying strategies and having a competitive advantage. However, resource-based theory opines that firms have diversified resources, and competing firms bring different resource bases into competition (Grant, 1991; McKelvie & Davidsson, 2009). The traditional strategic resource or resource-based view (Barney, 1991) for competitive advantage (valuable, rare, not imitable, and non-substitutable) needs to be rethought as the resource configuration in CE is different. Circular entrepreneurs have the opportunity to bring new resource ideas and new resource configurations for the firms by recycling and regenerating product design. Circular entrepreneurs will get a dynamic capabilities because of the technological innovation for resource configuration, while traditional and established firms are struggling to adopt CE principles.

#### 4.2.2.2 Competitors Reactions/Competitive Advantage

Competitive reactions and getting competitive advantage are essential in CE, and it is also vital to understand competitors' reactions to seize the opportunities. The heart of any strategy is to gain competitive advantage (Levine et al., 2017), and there is no single answer for that. For example, some researchers advocate that competitive advantage comes from industry or firms' capabilities and resources (Hoskisson et al., 1999; Levine et al., 2017). Other researchers

emphasize entry into the market and establishing in it, creating an oligopoly, curbing competition, or seeking unique resources and capabilities (Caves and Porter, 1977; McGahan and Porter, 1997; M. E. Porter, 1980, 1981; Barney, 1991). However, the competitive advantage of CE lies in innovative product design and bringing new technologies to recycle and redesign products and services.

#### 4.2.2.3 Intellectual Properties

Intellectual property (IP) and intellectual property rights (IPR) are essential in CE for innovation and implementation of BM. However, IPR is a double-edged sword in the development of technological entrepreneurship (Pathak et al., 2013). On the one hand, it protects entrepreneurs from competitors; on the other hand, it hinders entrepreneurs from imitating new technologies. Robust IPR implementation may discourage entrepreneurs because of costly technological adoption and patent costs (Pathak et al., 2013). Moreover, in developing countries where resources are scarce, strict IPR deters entrepreneurs from producing goods and services freely, whereas incumbent firms or multinational corporations (MNCs) control most IPs (Autio and Acs. 2010). Because incumbent firms have superior technology and favour robust IP control to exploit more profit (Laplume et al., 2014).

Hence, technological entrepreneurship faces impediments in developing or emerging economies because of low access to startup capital, which also worsens the problem of technological licensing and IPs (Pathak et al., 2013). Knowledge spillovers are essential because these countries lack a technological knowledge base (Pathak et al., 2013). Strong IPR implementation may create obstacles in the spillover process and hence will reduce the possible growth and innovation as most emerging startups get their ideas from previous employers ( Bhide, 2000; Acs and Sanders, 2008; Pathak et al., 2013). However, initially, getting IPR and keeping it for a startup for a certain period will give a competitive advantage for new

innovation. Hence, defending IP in CE innovation will facilitate and encourage more innovative products and services. In the dynamic capabilities theory lens context, IP is a 'choice variable' until the incumbent has challenged it and until the public policy works against IPR (Teece, 2018).

#### 4.2.2.4 Entrepreneurial Strategy

In the seizing stage, entrepreneurial strategy integrates the effort of competitors' reactions and defends intellectual property, which has already been discussed earlier. However, in the context of CE, the entrepreneurial strategies are different (keeping the main object of strategy same) than the traditional ones because the CE has brought new perspectives in designing the products and services. For example, one of the most effective strategies in CE is to extend the product life cycle to reduce natural resource use (Bocken et al., 2016). EBay Inc.'s CEO said, "The greenest product is the one that already exists because it doesn't draw on new natural resources to produce." (Bocken et al., 2016). For extending the life of the products, Bocken et al. (2016) provided the following product design strategies for the closing the products: i) Design strategies for a technological cycle, ii) Design strategies for a biological cycle, iii) Design strategies for dis- and reassembling.

On the other hand, they provide the following strategies for slowing product usage: i) Designing long-life products ii) Designing for a product-life extension. Alongside of product design strategies in CE, circular entrepreneurs must think BM strategies to adopt the CE principles. In CE, BM strategies are chosen that are fit in closing and slowing the resource cycle (Bocken et al., 2016). Based on the CBM framework, Bocken et al. (2016), proposed the following BM strategies for slowing resource loops: a) BM to access and performance: having products or services without ownership, for example car sharing, leasing b) Extending product value: residual value of the product from manufacture to consumer and again to manufacture,

for example, remanufacturing parts c) Classic long life model: providing long life products, for example, 20-30 year life span appliance d) Encourage sufficiency: decrease end user consumption through durability. However, for closing the resource loop, they provided the following strategies for CE: a) Extending resource value, collecting the residual value of resources, b) Industrial symbiosis, utilizing residuals of one process as the input of another process (Bocken et al., 2016). These strategies are now emerging because CE principles brought new entrepreneurial thinking into an existing linear system. So, circular entrepreneurs must adopt these strategies to gain a competitive advantage and dynamic capabilities. However, "no strategy works forever"; for example, once, Taxi cab operators thought that they had a perpetual mechanism and regulatory system to defend themselves, but Uber proved them wrong through their "sharing" strategy (Teece, 2018).

### 4.2.3 Transforming

**The third step** of gaining competitive advantage is transforming the existing BM and realigning the structure with culture towards circular entrepreneur. In this case, Teece (2018) suggested aligning existing capabilities and investing in additional capabilities.

As the CE brings new product design and BM formulation, circular entrepreneurs need to redesign its existing organizational structure. Universally, structure provides a set of analogous interdependent and interrelated relations with some common features (Cezarino et al., 2019). In a macroeconomic perspective, CE structure comprises social, economic, institutional and technological aspects that influence the internal structure of an organization (Cezarino et al., 2019). In the same token, CE determines the industrial structure at local and global levels (Chizaryfard et al., 2021). For example, policymakers are the important components of CE, and their decisions help to reconfigure the overall industrial structure (Fan, and Fang, 2020; Chizaryfard et al., 2021). This industrial transformation generates fundamental changes in

industrial structures and reshape organizational relationships, at the same time the new structures face resistance to change (Mathews and Tan, 2011; Chizaryfard et al., 2021). Moreover, the new economic and industrial phenomenon (i.e., CE) asks for basic changes in the organizational and industrial structure that formerly engaged in traditional transactions of resources (Mathews and Tan, 2011; Chizaryfard et al., 2021). As the transformative forces create disequilibrium and tensions among industries (Dahmén 1984), hence the prevailing structures must have a turbulence that reshape the old system and create new structure (Chizaryfard et al., 2021).

Another important aspect of transforming a company's BM is to change its existing culture. It is not easy to change the existing culture as the resistance to change always hinders this process. Transforming from linear to CE needs employees' positive mentality and commitment for safe transition. However, it is easy for startups to adopt positive culture for this transition as they start with positive mentality toward CE, whereas established firms may struggle to adapt with new culture (de Mattos & de Albuquerque, 2018). However, circular entrepreneurs need to reshape the existing ecosystem for adopting CE. CE ecosystem includes supply chain, customers, service partners, distributors, special raw materials providers (Salvioni & Almici, 2020). These ecosystem partners must transform their existing BM so that circular entrepreneurs can implement CE principles (Salvioni & Almici, 2020). Along with the ecosystem, organizational change is also needed in its culture, communication, leadership, coaching and behaviour (Bîrgovan et al., 2022).

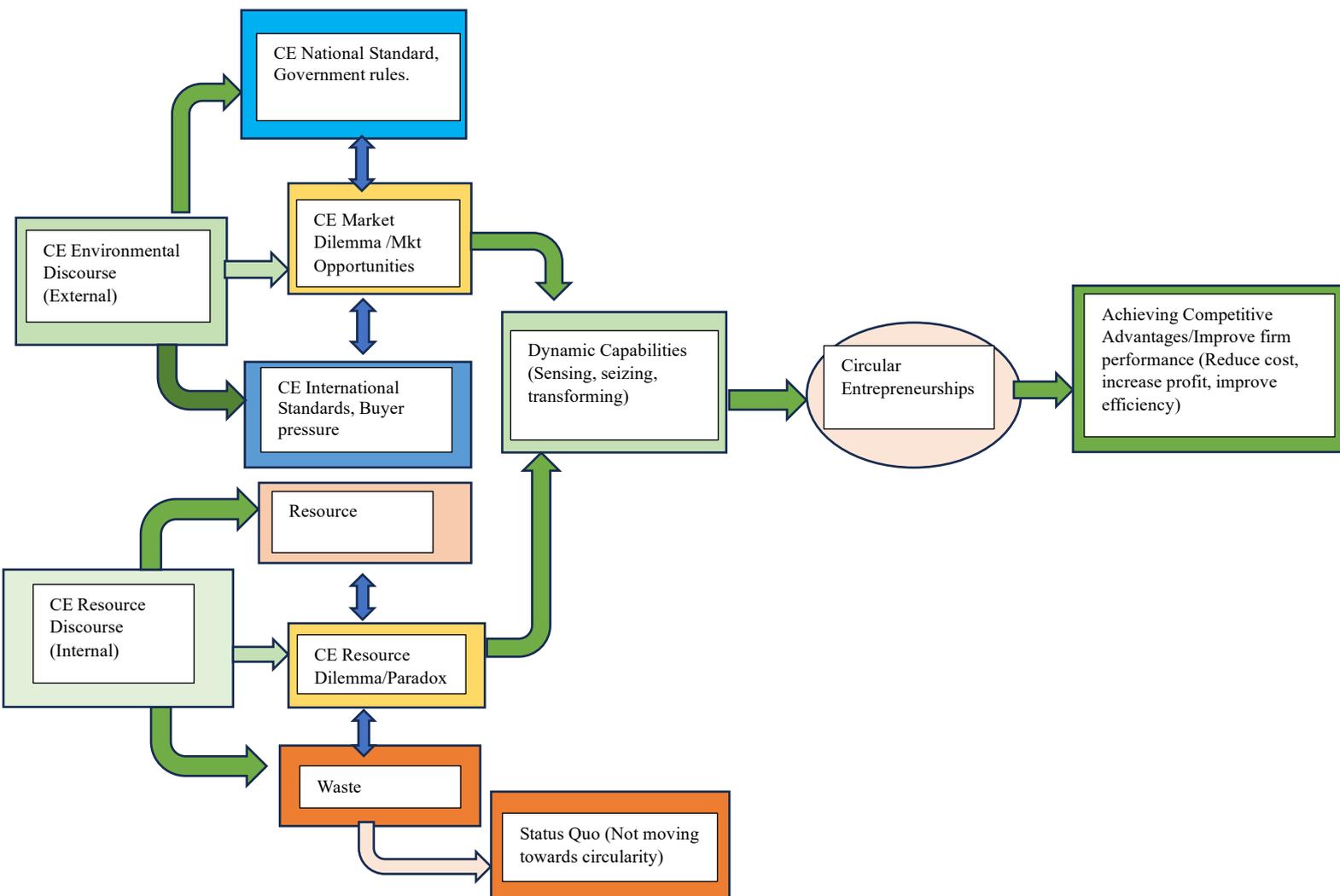


Figure 1.: Achieving Competitive Advantage through Circular Entrepreneurship (Author's own findings from literatures).

### 4.3 Methodology

The researchers in this study have adopted a qualitative research design due to its suitability for investigating emerging and innovative domains (Zhang et al., 2022). Moreover, a multi-faceted approach is employed, integrating both inductive (data-driven) and deductive (theory-

driven) methods within a comprehensive interpretive methodological framework (Goldkuhl and Cronholm, 2010; 2019).

Furthermore, the research approach in this study is characterized as deductive. The authors developed a theoretical model within the framework of Dynamic Capability Theory to examine the aspects of sensing, seizing, and transforming in circular entrepreneurship. They selected a case study methodology to empirically investigate issues related to circular entrepreneurial aspects (Yin, 2013). This exploratory investigation aligns well with the research questions, leading to the implementation of a multi-case study. Given the novel and complex nature of issues surrounding circular entrepreneurs in industrial settings, applying the multi-case study approach has facilitated a deeper exploration and understanding, effectively addressing the research questions. Moreover, multi-case analysis has provided valuable insights across diverse contextual settings and various industries (Zhang et al., 2023).

In addition, the authors employ an abductive approach to advance theoretical constructs and synthesize fresh perspectives on Circular entrepreneurship. They also incorporate deductive techniques to integrate new conceptual frameworks (Dubois and Gadde, 2002; Zhang et al., 2023). The researchers employed purposive sampling techniques to select case firms (Yin, 2013). The criteria for the firm selection were based on their active involvement in CE practices, including the demonstration of CE initiatives, a willingness to participate in data collection and interviews, and representation from a diverse range of industrial backgrounds. To identify and approach entrepreneurs and top-level executives from these chosen firms, the authors utilized their personal networks, engaged with industrial associations, and collaborated with professional bodies within their research domain.

### 4.3.1 Data Collection Context

The study context or case study focuses on Bangladesh for several reasons, particularly its environmental challenges. Bangladesh is among the world's most vulnerable countries to climate change (World Bank, 2014; Climate Change Vulnerability Index, 2014; Nurunnabi, 2016). Over the past 20 years, 60% of global deaths caused by climate change-related events, such as cyclones and floods, have occurred in Bangladesh (Nurunnabi, 2016). Furthermore, as an emerging economy, Bangladesh is recognized as one of the most environmentally affected nations, especially in terms of air quality (Ahmed et al., 2022; Ahmad et al., 2023). The concentration of fine particulate air pollution (PM 2.5) in Bangladesh is reported to be six times higher than the levels recommended by the World Health Organization (WHO) (Ahmed et al., 2022; Ahmad et al., 2023).

Additionally, Bangladesh is the eighth most populous country in the world, with a population of 173 million (Nurunnabi, 2016). It is also a major producer and exporter of textile products, making it particularly vulnerable to the negative environmental impacts of textile production along with other industries (Pervez, et al., 2021). In line with many other emerging countries, most industries, including the textile sector in Bangladesh, generally have low environmental awareness. While some businesses have integrated environmental initiatives into their practices, the majority remain unaware of the environmental consequences of their industrial activities (Majumdar and Sinha, 2019).

### 4.3.2 Data Collection Case Firms

The initial phase of data collection was conducted in meticulous face-to-face interactions, and data quality assessments were conducted after acquiring information from each firm. Initially, the authors collected data from 15 case companies during the period from November 2022 to

January 2023. Subsequent to an initial analysis of the gathered data, the authors decided to expand their data collection efforts. The subsequent phase of data collection took place from March 2023 to May 2023. After 2nd phase data collections, authors decided to collect further data through online interview. Authors further collected data from January to March 2024 for getting deeper insights regarding sensing, seizing and transforming aspects of the theory. After 3rd phase of data collection authors ultimately achieved theoretical saturation, ensuring the thoroughness and validity of the research findings.

The selection of case firms was also restricted to Bangladesh primarily because the research was sponsored by the Commonwealth Scholarships Commission, which mandated a focus on sustainable development within the researcher's home country. It is worth noting that the study included a substantial number of case firms, totalling 32, chosen for their diverse backgrounds and contextual settings.

For the primary data collection method, the authors opted for in-depth, semi-structured interviews. This choice was influenced by the method's flexibility and its ability to facilitate in-depth exploration of the conversations, as highlighted by Eisenhardt (1989). The specific interview questions can be found in Appendix A, and detailed profiles of the participating firms are provided in Table 1. Notably, the entrepreneurs who were interviewed bring a wealth of experience to the study, with some holding positions as business leaders, presidents, or former presidents of professional bodies. A subset of these individuals possesses over four decades of experience in the manufacturing industries, contributing extensive expertise in sustainability and circularity. This diverse and experienced group of interviewees has enriched the research insights, providing a comprehensive understanding of the circular entrepreneurial aspects in industrial settings.

### 4.3.3 The Profile of the Case Companies

**Table 1. Profile of Case companies, interviewees and Data Sources.**

Firms/Case Code	Region	Industry sector and business activities	Number of employees	Number of interviews	Designation	Data Source
1	Chattogram	Garments	28,000	2	Sustainability manager and Head of HR	Interview
2	Dhaka	Garments	861	1	Entrepreneur	Interview and websites
3	Chattogram	Garments	35,000	2	Entrepreneurs And Sustainability Head	Interview, factory visits, and websites
4	Dhaka	Garments	550	1	Entrepreneur	Interview and websites
5	Dhaka	Safety Gloves and equipment	10,000	2	Sustainability and Production Engineer	Interview and websites
6	Chattogram	Garments	40,000	3	Entrepreneur, Sustainability manager, Head of HR and Planning	Interview and websites
7	Dhaka	Garments	10,000	1	Entrepreneur	Interview and websites
8	Dhaka	Garments	1,400	1	Entrepreneur	Interview and websites
9	Chattogram	Building Constructions	5,00	1	Production manager	Interview and websites
10	Dhaka	FMCG	7,180	1	HR Manager	Interview and websites
11	Dhaka	Power Generation	5,00	1	Production Engineer	Interview
12	Dhaka	Garments	21,000	1	Head of HR	Interview and websites
13	Dhaka	Pharma	10,800	1	Head of Quality	Interview
14	Dhaka	Garments	15,245	1	Head of Sustainability	Interview and websites

15	Chattogram	Paper	1,000	1	Managing Director	Interview
16	Chattogram	Garments	750	1	Entrepreneur	Interview
17	Chattogram	Steel Manufacturing	2,286	1	CPO	Interview and websites
18	Chattogram	Garments	7,000	1	Deputy General Manager	Interview and websites
19	Dhaka	Constructions and others	35,053	2	Head of Market Intelligence, Head of HR	Interview and websites
20	Chattogram	Garments	25,000	1	Head of Finance	Interview and websites
21	Dhaka	Garments	18,000	1	Head of HR	Interview
22	Dhaka	FMCG	1,50,000	1	Entrepreneur	Interview and website
23	Dhaka	Waste Management	20	3	Two Entrepreneurs, and one scientist	Interview
24	Chattogram	Steel Manufacturing	2,800	2	Head of Marketing, Head of production	Interview
25	Chattogram	Chemicals	10	1	Entrepreneur	Interview
26	Chattogram	Agriculture	12,500	1	Entrepreneur	Interview and website
27	Dhaka	Plastic Products	250	1	Entrepreneur	Interview
28	Dhaka	Paper Mills	200	1	Production Manager	Interview
29	Dhaka	Bio-plastics	75,000	1	Scientist	Interview
30	Dhaka	FMCG	10,000	1	Head of HR	Interview and websites
31	Dhaka	Pharmaceuticals	3,000	1	Head of Quality Assurance	Interview
32	Chattogram	Ship making and repairing	1,000	1	Head of Commerce and purchase	Interview

To bolster the research's robustness, the authors adhered to the principles of triangulation, as proposed by Tracy (2010). This entailed incorporating multiple secondary data sources to corroborate the findings from interviews. This triangulation methodology aimed to validate the insights obtained through interviews. Furthermore, the authors took advantage of the

opportunity to interview multiple representatives within the same firm, a practice that not only yielded a wealth of diverse information but also provided a fascinating glimpse into various backgrounds.

To ensure the validity and reliability of their data collection, the authors rigorously checked for consistency across various interviews. To assess construct validity, researchers incorporated semi-structured interviews from multiple sources, as Yin (2009) recommended. Additionally, the findings were scrutinized by two impartial senior academics as an additional validation measure. To address concerns related to internal validity, the authors adhered to a structured data coding and analysis process, following the guidelines Yin (2009) outlined.

#### 4.3.4 Details of Coding Protocol

The researchers meticulously adhered to the coding protocol as a crucial component of their research methodology (Williams and Moser, 2019). The main objective of following this protocol was to create a set of well-defined, rigorous, and consistently implemented coding procedures, thus ensuring the standards of validity and reliability in qualitative research (Williams and Moser, 2019).

The coding process consists of three phases: open coding, axial coding, and selective coding. In the open coding phase, researchers identify distinct concepts and themes from raw data, structuring it into broad thematic categories (Williams and Moser, 2019). This initial phase aims to convert raw observations into conceptual expressions. Axial coding, the second phase, refines and categorizes the themes identified during open coding. This phase involves systematically sifting, refining, and aligning the data to create well-defined thematic categories, preparing for the final phase of selective coding (Williams and Moser, 2019). Axial coding also uncovers connections between open codes, forming core codes supported by robust evidence (Strauss, and Corbin, 1990).

Selective coding, the third and concluding stage in the coding process, is a critical step where the researcher exercises discretion to purposefully select and merge the organized data categories derived from axial coding into coherent and meaningful constructs. Selective coding builds upon the groundwork laid during axial coding by operating at a higher level of abstraction (Flick, 2009, p. 310). This involves actions that further enhance and shape the narrative or case under investigation, thereby significantly influencing the outcomes of the study.

The meticulous refinement of data is central to this process, which enables the development of a cohesive narrative or case from the data categories. This involves carefully selecting the primary thematic category and the systematic alignment of this core theme with other categories that have undergone the process of selective coding. This approach is important in shaping the output from selective coding into a 'case' or 'story.' (Strauss, and Corbin, 1990). In doing so, it provides researchers with versatile and multifaceted means to encode and present the outcomes of their study.

#### 4.3.5 Data Validity and Reliability

Regarding external validity, the researchers adopted a multi-case approach and utilised purposive sampling, ensuring alignment with well-established practices in the field. To enhance reliability, the authors implemented a comprehensive case study protocol. This protocol encompassed systematic data recording and transcription, accompanied by iterative discussions within the research team (Yin, 2009). Typically, the duration of each interview averaged between 40 and 60 minutes. For example, author communicated interviewees from different personal networks and received the consent for interviews. Based on their availability author select the locations for interviews. Sometimes interviews took place at the factories and author has the opportunities to look at the operations physically. Author travelled different parts of

country physically and had the opportunity to observe the factories recycling and sustainability practices. These physical observations also improve the data validity and reliability.

A variety of evidence sources were employed to ensure construct validity, including semi-structured interviews and diverse forms of secondary data. For secondary data we rely on online and company websites and collected data to validate it. To establish a robust chain of evidence, multiple interviewees within the organization were engaged whenever possible. For example, researcher took multiple interviews from the Cases (Code): 1, 3, 5, 6, 19, 23, 24. This approach helped triangulate the data and enhance the reliability of the findings.

The findings underwent a rigorous review process, involving assessments by two senior supervisors, who provided critical feedback and guidance. Additionally, interviewees were given the opportunity to review the interview transcripts, offer feedback, and provide clarifications. This iterative process allowed for the refinement and revision of the transcripts, further strengthening the validity and accuracy of the collected data.

Internal validity pertains to establishing the justification of causal linkages (Baskarada, S., 2014). Internal validity was meticulously upheld throughout the data analysis process, ensuring the reliability and accuracy of the findings. The study implemented controlled data coding and analysis methods, maintaining consistency and minimizing biases. Multiple measures were employed to bolster internal validity, including the engagement of senior academics for review, allowing for critical feedback and ensuring thoroughness. Interviewees were also involved in the review process, offering feedback and clarifications on transcripts, thus enhancing the credibility of the data. For example, during transcriptions and coding, researcher consulted with supervisor and took advice for ensuring robustness of the data. Accordingly, researcher took additional interviews and follow specific coding methods that clarify the coding and development of the themes.

External validity addresses the issue of determining whether the findings can be generalised to other contexts or cases (Baskarada, S., 2014). External validity was bolstered by employing a purposive sampling approach, ensuring that the selected cases were representative of the broader population under study that will help the generalisation. This method allowed for targeted selection of cases that best reflected the phenomena of interest, enhancing the generalizability of the findings to similar contexts. Additionally, the study replicated its methods across multiple case studies, thereby increasing the external validity by demonstrating the robustness and consistency of the results across different settings. By adopting these strategies, the study was able to enhance the external validity of its findings, making them applicable and relevant to a broader range of contexts beyond the specific cases examined. For instance, to get the broader perspectives of circular and sustainability practices researcher covers different industries such as RMG, steel industries, waste management companies, pharmaceuticals, electronics, and building constructions companies.

Reliability pertains to showing that identical results can be achieved by replicating the data collection process (Baskarada, S., 2014). In essence, other researchers should, in theory, be able to follow the same procedures and reach the same conclusions. Two approaches to ensuring reliability in case studies include the development of a case study protocol and the establishment of a case study database (Yin, 2009). In this research, reliability was ensured through the implementation of rigorous protocols and systematic procedures throughout the research process. The researchers developed a detailed case study protocol to standardize their field research methods and subsequent analysis, promoting consistency and minimizing variability in data collection and interpretation. A detail case study protocol includes; developing research questions, developing research model, selection the case companies that are relevant to the study, follow the standard data collection procedure, collection of field data, maintaining ethical considerations, and ensuring consistency. Additionally, they established a

comprehensive case study database containing various sources such as recordings, transcripts, internal documents, and news coverage, providing a robust foundation for analysis and verification of findings. Moreover, the research team engaged in regular iterative discussions, fostering continuous collaboration and analysis, which further enhanced the reliability of the study by allowing for cross-validation of results and addressing any discrepancies or inconsistencies. Overall, these measures contributed to the reliability of the research outcomes, ensuring that the findings were credible, trustworthy, and replicable.

#### 4.3.6 Coding Protocol for developing themes

Table 2. provides detailed process for developing themes. Coding data for developing themes follows three stages. Following Koller, et al. (2022), researcher first coded data in terms of content, then use categories to present data and to look how entrepreneurs take decisions based on the CE opportunities. Finally, researcher showed the code with exemplary quotes to provide evidence. The following Table 2. provides the details of coding protocol such as code structure, exemplary quotes and content:

**Table 2. Structure of Coding and Content of Dynamic Capabilities and exemplary quotes**

Company Code	Dynamic capabilities and content	Competitive Advantage	Coding issues and focus			Exemplary Quotes
			Sen	Seiz	Trans	
1	<b>Sensing Through climate crisis</b>	x	x			1.“Yes, we are sensing there is a CE is the future of our world...right now we are facing water crisis in Chittagong...Dhaka is one of the worst air quality city of the world,..Buriganga river, Karnapuli river, a lot of river are polluted by waste water” “(Seizing) related with our higher management”, “(Transforming) No, it is not aligning. We need lot of changes.”

2	<b>Sensing through market, seizing through technology</b> ,	x	x	x	x	“We are using ETP. In ETP, we are using zero discharge. Okay? We are using MAMBRANE....”
3	<b>Sensing through market, Seizing through technology</b>	x	x	x	x	“ 1 “They(customers)are even also committed to reduce 30% of carbon emission .” ...But last 10 to 15 years, we have gone through a journey of transformation in order to reduce water and energy consumption and also introducing recycling successfully.” 30 years back, per jeans water consumption was more than 100 liters but now with the help of modern technology and chemicals, it reduces to 5-10 liters per jeans.”
4	<b>Sensing through market, seizing through technology</b> ,	x	x	x	x	“ <b>1.</b> I can see that the demand of recycled product is actually growing. So, what happens, we started searching who is making this product...”, <b>2.</b> “So, this kind of data-driven activities, there is a data-driven information is very important to sell your products (redesigning)” “For my company is, I am telling you that we have a inbuilt system for many years...so, we are practicing for many years these things.”
5	<b>Sensing through market, seizing through structural change</b>	x	x	x	x	“ <b>1.</b> We are sensing that in future, I think in the next 5 or 10 years, you cannot buy anything without carbon tax.”Yes, we are very much aligned and our top management also they have enough actually risk-taking capability to adopt this structural change. They are very much ahead on that.”
6	<b>Sensing through market, seizing through technology</b> ,	x	x	x	x	<b>1.</b> “Well, changes are coming every....(sensing)”, <b>2.</b> “This is a demand of the time..(seizing)”, <b>3.</b> “You see the restructuring process is the never-ending process....,So my organization believes it, that is why our growth is ther in 30 years we are in one of the positions and we believe we can sustain...”

7	<b>Sensing through market</b>	x	x			I would say that recycling is not a fashion...it is a time consuming process, right. It is our necessity. "Technology in third world country like ours, not developed"
8	<b>Sensing through climate change, seizing through resource optimization</b>	x	x	x	x	"1. I think that the first sense because in Bangladesh we are witnessing this time of year, it is very high temperature, ...an effect of El Nino, global climate has changed significantly", 2. So, optimization of resources is very very important...also creating awareness about optimization of resources not only in materials but also usage of electricity, usage of air conditioners"
9	<b>Sensing through government and regulations</b>	x	x			"I don't see Bangladesh to be honest there is any change at all....government has any vision on it."
10	<b>Sensing through product quality and efficiency, seizing through automation.</b>	x	x	x	x	"1.We have to focus to recycle our product and we have to also ensure the quality of the product." "2. Here we are taking initiative, some automation, and some robotic science, we are working with different organization in Bangladesh."
11	<b>Sensing through efficiency, seizing through technology</b>	x	x	x	x	1."Actually we have developed some KPIs indicators we have distributed the KPIs and as leading indicators, we are measuring how much waste are generated and we are calculating it from quarter to quarter. Always we are trying to continually improve our performances.", 2."GE is promoting more towards renewable energy. GE has a wing which is working on renewable energies. Also usage of clean hydrogen for power generation.", 3."We are promoting our cleaner technologies such as 9HA or clean hydrogen or using renewable energy to generate power"

12	<b>Sensing through market</b>	x	x			<p>“1. Our company wants social reputation, number one, right to be the market leader, right and cost-effective also” “2. Entrepreneurs are very interested to build their green factory. If they go for the green factory, it could be definitely happen, because it is a requirement, pre-requisite without it you cannot be sustainable. You can't be a LEED certified factory.”</p>
13	<b>Sensing through productivity and efficiency, seizing through continuous improvement</b>	x	x	x	x	<p>“1. If you think every process we are, we have to maintain zero waste, then that will help us our productivity, that will help us our minimize the costs.”, “2. The continuous improvement process, considering 0 waste, and also considering the recirculation...”</p>
14	<b>Sensing through market demand, seizing through technology</b>	x	x	x	x	<p>“1. So, what is the demand coming from outside, inside to my neighbors from my inside the country, outside the country. I need to keep this with all those things. And these helps us in sensing why I should go for circular economy.”, “2. Now we are capable of using those consumed goods. So, it is this mindset, these latest technologies and trainings, it helps us to cope up with those changes.”</p>
15	<b>Sensing through product efficiency.</b>	x	x			<p>“One is the use of recycled fiber and the percentage of recycling of fiber. This reduced the cost of the paper.”</p>
16	<b>Sensing through market</b>	x	x			<p>“The standard right now exist in China and but I don't know why buyer is pushing Bangladesh on this.”</p>
17	<b>Sensing through market, seizing through technology</b>	x	x	x	x	<p>“1.If you look at the market...if you want to get benefit out of your products that you need to be very competitive into the market...”The main materials of steel is scrap, and most of the components are sourcing this from the similar source....sustainability is the only way where you can focus on.”, “2. I am currently working on and leading the transformation journey of GPH in terms of organizational changes and design.”</p>

18	<b>Sensing through market, seizing through awareness</b>	x	x	x	x	“1. I said that compliance, social compliance, environment, all this right, now becoming prerequisite. So, there is no way that we can move forward with those these things.” “2. I mean intelligent, intellectual people working in the industry. I mean to grab new things to have a open mind....Bangladesh has process a lot of transformation”
19	<b>Sensing through market, seizing through technology</b>	x	x	x	x	“1. “Yes, we’ve started our journey toward reducing the tissue paper, for instance.” “our job is to understand the macro economy first..” “2. Yeah, in terms of energy consumption, we are installing solar panels...”
20	<b>Sensing through climate change, Seizing through technology adoption</b>	x	x	x	x	“1.Sensing actually we are getting the awareness for environment preservations. Every year we see in the global climate summit all countries prime minister and government head are telling about carbon emission and global warming.” “2. “We are also not exceptional adapt to the circular economy or sustainability theme in our production, man power designing and also the customer satisfaction...we are already adapted some machineries, production process...”
21	<b>Sensing through climate change, seizing through R-strategies and technologies</b>	x	x			“1. You know in the whole world, there is a crisis like global warming, carbon emissions. There is a seasonal change. At the same time, the cost of the product is there.....so this actually comes out our attention”2. “Now we are keeping it, sorting it, recycling it and reusing it. ....there are other technologies people use like solar power and rain water....”
22	<b>Sensing through local market,</b>	x	x			“I told you earlier, the first thing is our ‘Tokai (street children). Bring some of those, they will give you some good ideas...Go to Dhalai river. The way they separate these two parts, the aluminum part and plastic part to reproduce different items”
23	<b>Sensing through</b>	x	x	x	x	“1. Waste hampers daily life of people, so first, our main motive was that to bring a better life to the people because a lot of

	environment, seizing through technology					hazardous chemical metal there...to make waste problem into wealth...”, “2. So, we have invented this type technology that can make these things to usable products.....so our plant basically, totally eco-friendly..”
24	Sensing through environment, seizing through technology	x	x	x	x	“1. In Bangladesh, there is pollution everywhere, like water where we are discharging plastic and other wastages.....so you see people are polluting the environment by throwing the contaminated chemicals.”, “2. We already took the technology, because we are capturing almost all the waste management.”
25	Sensing through environment,	x	x			“Actually, sense means the change of environment and the change of business also. This is related to sustainability. Environment is already changing but we try to make an opportunity for another business or by product business also”
26	Sensing through environment, seizing through technology	x	x			“1. You have to protect your surrounding environment...”, “In practice, it is not yet ready, because you have to work on it to understand the people...”, “2. We use products of which almost 70% are recyclable...we recycle the raw materials.”
27	Sensing through market	x	x	x	x	“There is no chance to avoid plastic. For one party, the plastic may be wastage but the wastage can be raw materials for another party”
28	Sensing through market, seizing through technology	x	x			“1. Because of the economic condition of Bangladesh and the reduction of export and import, there is a lack of raw materials of paper. Many mills are closed due to the extra charge of raw materials.”, “2. Earlier we used to need a lot of labor, but now we get help from <b>technology</b> .”
29	Sensing through environment, seizing through product design	x	x	x	x	“1. Plastic is not only harmful to the environment but also harmful to people.”, “2. There are some organic or bio-plastic products, like Sonali Bag, which are plastic free.”

30	<b>Sensing through environment, seizing through R&amp;D</b>	x	x	x	x	“1. So, by seeing that we try to get into the latest technology, so that our wastage are less, and environment pollution are less...”, “2. R&D seizing this opportunity.”, “ how can we work, there has ample of opportunities...”
31	<b>Sensing through surrounding environment, seizing through standard.</b>	x	x	x	x	“1. <b>If you see</b> , just in 2 years or 5 to 10 years back, the tissue paper. What we are used....the beauty of circular economy that is come from the paper waste..”, “2. There is the regulatory area as in the pharmaceutical company, local and global standards all the time ...they are very strict in this regard.”
32	<b>Sensing through surroundings</b>	x	x			“I strongly believe that circular economy has a huge prospect in our country.”, “But we don’t think that there is some pragmatic steps taken by the higher authorities. It is a buzzword.”

**Note. Sen=Sensing, Seiz=Seizing, Trans=Transforming**

## 4.4 Findings

### 4.4.1 Circular Economy Environmental Scanning: Environmental Vs Resource Discourse

Table 3, Table 4, and Table 5 summarize the sensing, seizing and transforming for getting dynamic capability through circular entrepreneurship strategies and also show how companies get competitive advantages through adoption of technologies such as ETP, WTP, and other recycling technologies.

In the business world, senior executives, entrepreneurs, and managers have a lot to consider when understanding how their company operates in the broader environment. They look at various factors to sense the environment, such as the state of the economy, what consumers

care about environmentally, changes in weather patterns, water quality, how products are being used, market trends, customer preferences, competitor actions, market gaps, new technologies like Industry 4.0, and global environmental issues like temperature changes and water scarcity. Based on our empirical study, we divided the environmental scanning or sensing into the following two categories: i) Environmental Discourse and ii) Resource Discourse

#### 4.4.1.1 Environmental Discourse and Growing Market Dilemma

Most interviewees have noted their awareness of recent environmental shifts and environmental discourse. For instance, interviewees have pointed out alterations such as localized water scarcity and increased salinity in rivers and oceans, shifts in air and water quality, particularly in national rivers like the Karnaphuli and the Buriganga in Bangladesh, and seasonal variations. An interviewee, who is an entrepreneur from the garment industry (Case code-8), expressed the issue in the following way: "... it is an effect of El Nino. The global climate has changed significantly. And it is because of the fact that we have not thought about these issues much earlier, protecting the environment while we industrialize the world. So, in **terms of sense**, I think the first issue, the first realization comes from physically experiencing the global climate change and its effects on coastal belts where the water level is rising because of the melting glaciers, because of the increase of salinity, because of lack of availability of water." The above comments clearly shows the environmental discourse and what managers think about changing environment and how they sense it.

Several interviewees have pointed out issues such as melting glaciers, rising salinity levels, and water scarcity. These concerns have raised awareness among top-level executives and entrepreneurs, compelling them to reevaluate their business models in light of environmental

changes. Failure to do so may jeopardize the well-being of future generations. However, these environmental discourse lead to CE market dilemma where entrepreneurs are in tensions whether they will comply with environmental issues or not for being competitive in the market.

**Table 3.: Summary of Environmental Scanning:**

Environmental and Climate Change Sensing	Market Sensing	Market Standards, government, and International Laws	Economic, resource efficiency,	Technological Possibilities and Development
Sensing through climate change (Case-1), , facing water crisis in Chattogram (Bangladesh), worst air quality in Dhaka (Case-1), Buriganga river, Karaphuli river, a lot of river are polluted by wastewater (case-1), very high temperature (Case-8), awareness for environment preservations (Case-20), global warming, carbon emissions (Case-21), waste hamper daily life (Case-23), In Bangladesh there is pollution everywhere (Case-24), change of environment (Case-25), protect your surrounding environment (Case-26), environmental pollution (Case-30),	They(customers)are even also committed to reduce 30% of carbon emission (Case-3), the demand of recycled product is growing (Case-4), you can't buy anything without carbon tax (Case-5), it is our necessity (Case- 7), to be the market leader (Case-12), demand coming from outside (Case-14), buyer is pushing Bangladesh (Case-16), you look at the market (Case-17), compliance now becoming prerequisites (Case-18), Tokai will bring ideas (Case-22), there is no chance to avoid plastic (Case-27),	International conference on standard, there is regulatory area (Case-31), we have to follow the international ISO standard (Case-10).	Observing rural and local economy, farmers, travelling in local areas, this is the demand of the time (Case-6), we have developed KPIs (Case-11), because of economic condition (Case-28), there are some organic or bio-plastic (Case-29), CE has huge prospect (Case-32).	Campaign on Industrial 4.0, robotics (Case-10).

#### 4.4.1.2 Market Changes, Market Dilemma and Buyer Pressures

Under environmental discourse, one of the major elements of the environment in CE context is market discourse. Many interviewees have pointed out that market changes are indicators for gauging the environment and identifying opportunities through environmental awareness. For example, a prominent market trend revolves around the **demand for sustainable and biodegradable products**, the increasing pressure from consumers to promote recycling, heightened customer awareness, and **the stakeholder pressures within the market** to maintain environmental cleanliness. This echo came from a sustainability manager of a garment industry (Case code-6, additional interview):

“If you have seen the **American market**, especially our buyer offices—almost all the buyer offices in America—they always send us different kinds of activities like **solar panels**, geothermal, and waste processing machines.”

In light of the **global market's** shift towards sustainability, several interviewees have emphasized the potential benefits for organizations that embrace CE principles by the year 2025 or 2030. This proactive stance is seen as essential for effectively adapting to changing market demands. Interviewees have observed, scanned environment and sensed these shifts in various ways, including through social media, newspapers, buyer behaviour and demands, the increasing requirement for recycled products, **growing demand** for recycled items within supply chains, a surge in calls for renewable energy and sustainable products, major corporations initiating recycling-based business strategies, competitive pressures, and the widespread discourse surrounding the CE. Additionally, interviewees have taken note of evolving consumer practices, changing buyer mindsets, heightened social compliance with CE principles, efficiency imperatives, alterations in sustainability parameters, and a diversification

of investments in sustainability. The potential benefits of circular entrepreneurship are vast, and efforts in sensing and seizing these opportunities are crucial.

#### 4.4.1.3 Market Dilemma and Market Scanning Through Standard, international and National Regulatory Changes

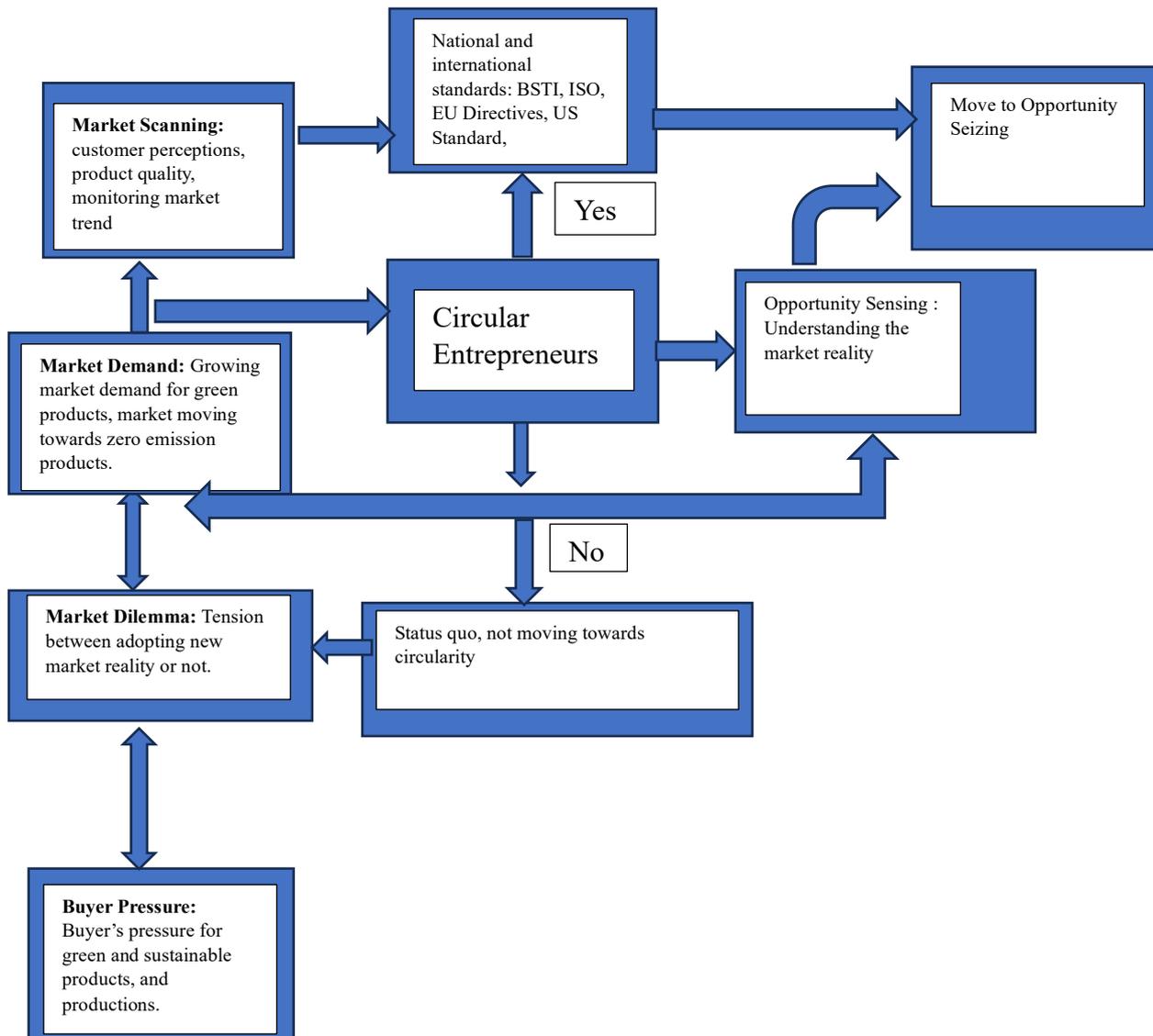
A substantial portion of the interviewees have emphasized that the pursuit of circularity and the quest for competitive advantage are also driven by international influences, including shifts in international trade regulations, European Union (EU) directives about environmental matters and sustainable goods, international buyer demands, and concerns related to international compliance.

Increasing concern regarding national and international regulations presents a dilemma for circular entrepreneurs. They must decide whether to adopt any standards, and if so, whether to align with national frameworks for circularity and sustainability (where such frameworks exist) or to adhere to international standards. Some organizations capitalize on circular opportunities and progress towards circularity, while others remain stagnant, merely fulfilling the requirements of their local markets.

#### 4.4.1.4 Market Demand, Economic Efficiency and Technological Development

Several interviewees indicated that economic conditions and technological developments are good indicators of overall changes in the market and environmental scanning. Interviewees sometimes scan the environment by observing the local economy, looking at local and national demand regarding green products, and observing the potential alternatives of plastics. Some interviewees also indicate the adoption of industrial 4.0 and the development of technologies for their environmental scanning. Table 3., summarizes the environmental scanning with the evidence of case companies. In the market scanning, almost all the companies agreed that they are scanning a change in the near future regarding CE, and they are facing national and

international pressures to adopt circularity in their production and operations practices. However, entrepreneurs also in great dilemma whether they will adopt circularity or not. Those entrepreneurs adopt circularity in productions and operations, they move to seizing the opportunities. Entrepreneurs who are not seizing opportunities remain traditional and maintain status quo.



**Figure 2.: Environmental Scanning that Lead to Market Seizing (Authors' findings)**

Numerous interviewees have also conveyed their awareness of the global surge in sustainability and circularity consciousness, motivating them to embrace CE principles. Specifically, entrepreneurs and top-level executives have expressed their apprehension regarding impending developments, such as the implementation of carbon taxes, the proliferation of sustainable products, the establishment of carbon exchanges, and the growing international pressure to achieve carbon neutrality within the next 5 to 10 years. From the head of HR and compliance director of a garment industry (Case code-6, additional interview, head of HR and compliance), the same echoes vibrate as follows:

*“..external is our brand like Target. **Target is very aggressive on it. They have given us target, we have to be our GHG emission need to be reduced 50% and by 2040, it needs to be 0% and Walmart also. Walmart also coming with their own, for anything dumping in the soil like any kind of waste totally prohibited now. We cannot dump anything in the soil, not the piece of fabric plastic or paper anything, we are not allowed. We are not also doing that. So those are the external factor and Contour also coming with the same standard then another USA brand that is contour Contour also coming with the same standard.**”*

It's a common thread among the interviewees that environmental and climate changes are driving market, growing entrepreneurial tensions and creating regulation shifts from international to national regulations. This shared understanding has led to a collective sense of urgency to protect the climate and transition to circularity and sustainability avoiding any tensions and dilemma.

#### 4.4.2 CE Resource Discourse, Resource Dilemma, Opportunity Seizing Through Business Model and Design Change

DC brings resource discourse whether circular entrepreneurs consider waste products as resources or just as wastes. This resource discourse brings tensions and entrepreneurs need to decide in which way (resource vs waste) they need to move. Not all entrepreneurs consider waste as resources. Our extensive empirical research reveals that circular entrepreneurs, top-level executives, and managers gain a competitive advantage and move to seizing circular opportunities by executing key strategic initiatives. These include reconfiguring product designs to enhance their market position, adopting CE practices to maximize resource efficiency, and employing cost leadership strategies when materials are similar. Additionally, they leverage advanced technologies, integrate sustainability into their business models, transition to circular business processes, repurpose waste into valuable products, and implement innovative work redesigns like piecemeal or trial-and-error systems. These initiatives collectively drive superior performance and market leadership.

One of the interviewees from a safety equipment manufacturing who has been working as a production engineer (Case Code-30) mentioned in the following way:

*“Yeah, actually, we have a dedicated **R & D, team equipment**. That is the Central R & D. Department, and each they have the working on **this new product development**. So how there is a **direction from the board** that we first look. We must look the material, or is it renewable, it is sustainable for you developing a product? So, there is a direction. There is a guideline for that”*

Similarly, seizing the circular entrepreneurial opportunities requires a strong focus on technology and investment in R&D. This issue also indicated by another interviewee who has been working as a head of the HR of a big Fast Moving Consumer Goods (FMCG) company of Bangladesh (Case Code-31): *“In fact in Bangladesh, most of the private sector owners, entrepreneurs, they are more focus on production, they focus on latest technology,.....I mean R&D, there are ample of scopes...R&D seizing these opportunities.”*

Within the textile industry, factories are capitalizing on opportunities by implementing advanced technologies. For example, they have shifted from traditional methods to adopt membrane-based reactor technology, increased their utilization of natural fibres over traditional ones, incorporated effluent treatment plans (ETP), managed polymer sludge, engaged a larger workforce dedicated to sustainability, decreased power consumption through the adoption of renewable energy sources, employed resource-efficient technologies, and enhanced their processes through the integration of robotics and artificial intelligence (AI).

Within steel manufacturing organizations, certain industry leaders are actively embracing opportunities to advance their commitment to the principles of CE. These efforts include transitioning from regular furnaces to electric arc furnaces to reduce carbon emissions, deriving valuable products from waste materials such as extracting metals from sludge or steel waste, implementing water treatment plants (WTP) and effluent treatment plants (ETP), and harnessing solar panels. These initiatives underscore their dedication to leveraging the opportunities presented by the CE.

**Table 4. Summary of Seizing and Organizational Redesigning**

Seizing through Organizational Redesigning and market standard	Seizing through Business Model (BM) and process change	Seizing through Improving Value Creation, resource efficiency	Seizing through searching and adopting Technology	Seizing through entrepreneurial strategies
Regulatory area as in the pharmaceutical company, local and global standards ( <b>Case-31</b> ),	Improvement of the plan, adopting by higher management ( <b>Case-1</b> ), we have inbuilt system for circularity ( <b>Case-4</b> ), adopt this structural change ( <b>Case-5</b> ), restructuring process is never-ending ( <b>Case-6</b> ), the continuous improvement process ( <b>Case-13</b> ), organizational changes and design ( <b>Case-17</b> ),	We are using membrane ( <b>Case-2</b> ), optimization of resources ( <b>Case-8</b> ), there is no chance to avoid plastic ( <b>Case-27</b> ), there are some organic or bio-plastic ( <b>Case-29</b> ),	We are using ETP ( <b>Case-2</b> ), modern technology and chemicals ( <b>Case-3</b> ), some automation and some robotic science ( <b>Case-10</b> ), we are installing solar panels ( <b>Case-19</b> ), adopted some machineries ( <b>Case-20</b> ), other technologies ( <b>Case-21</b> ), we have invented this type of technology ( <b>Case-23</b> ), we get help from technology ( <b>Case-28</b> ),	A journey of transformation ( <b>Case-3</b> ), Seizing through R&D strategy, entrepreneurs are very interested to building their green factory ( <b>Case-12</b> ), technologies and trainings, help us to cope up with ( <b>Case-14</b> ), grab new new things to have open mind ( <b>Case-18</b> ), R&D seizing this opportunities ( <b>Case-30</b> ),

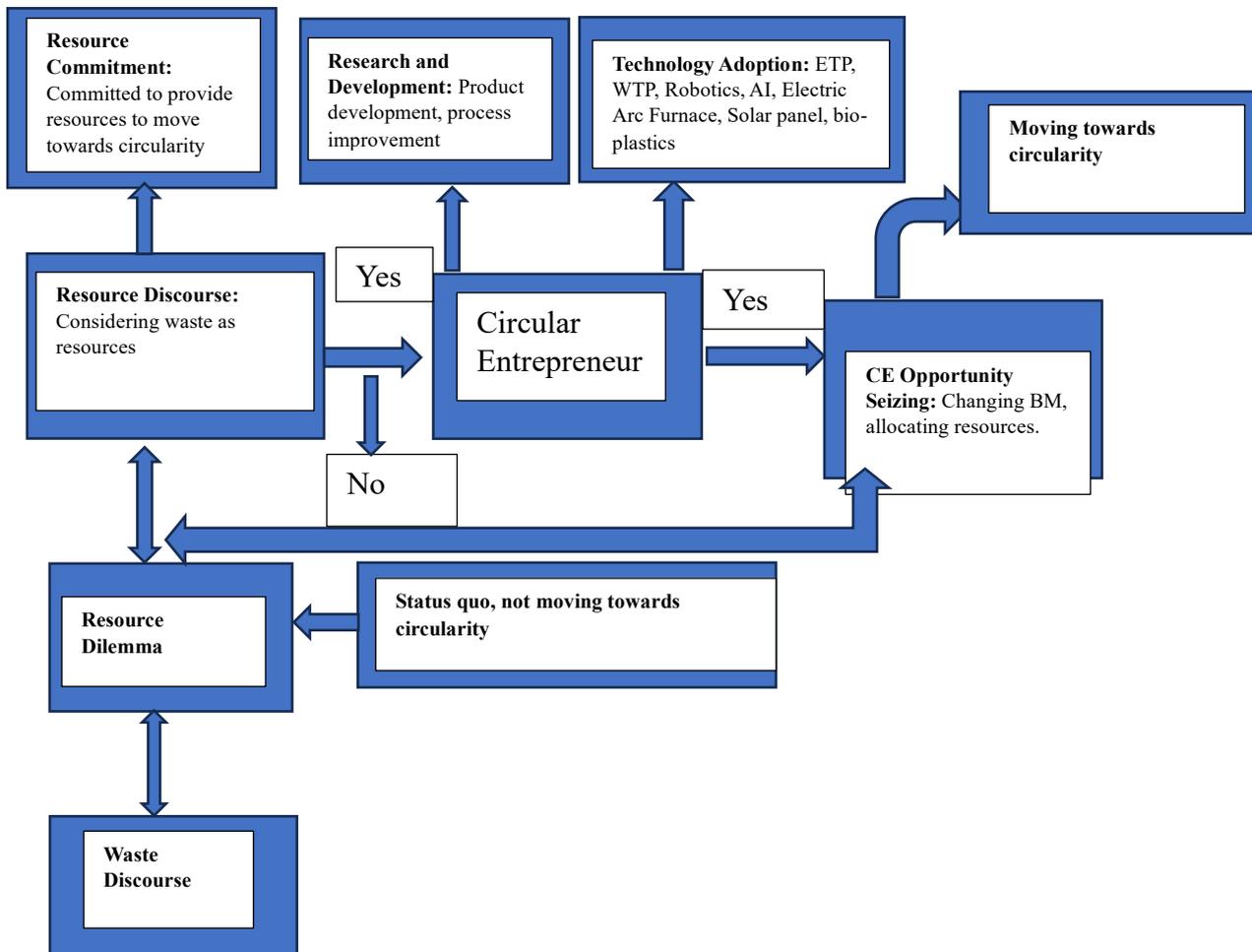
Some entrepreneurs and organizations have initiated incorporating post-consumer goods into their operations, thereby **enhancing the value of existing products** as part of their commitment to circularity. For instance, within the pharmaceutical industry, there is a shift towards using less toxic and hazardous chemicals, such as methanol, to safeguard the environment. Moreover, they are increasingly employing recyclable materials to mitigate environmental risks. Additionally, they have established procedures for handling hazardous products, including their transfer to third-party entities for recycling or incineration. These sustainability practices have become increasingly prevalent across various industries, and an

increasing number of standard industrial regulations and practices are being adopted to foster circularity and gain a competitive edge. Another interviewee from a large FMCG industry who has been working as head of HR in the company (Case code- 10) opined in the following way to show how the organizations seize the opportunities:

*“We have no alternative to use the **process development** (technology adoption) or the quality ensuring, cost reducing, actually that's called sales management. So, here the top management, top management have a vital role, then this is related with the cost. Now when we are taking some **process development like the robotic or artificial intelligence**, we have to adapt, we have to collect, we have to source the technology from outside of the organization.”*

Based on the above discussion, we derive the following figure that indicates how circular entrepreneur seize the opportunities from CE. It was found that while organizations adopt CE principles, they need to redesign their organizational business model and **improve value** creation for customers, which ultimately leads to organizational transformation.

### Resource Dilemma, Seizing the CE Opportunities: The Mirco-Model



**Figure 3.: Seizing the CE Opportunities that Lead to Transforming the Organization.**

#### 4.4.3 Moving Toward Circularity and Competitive Advantage Through Transformation

Through extensive field visits, the researchers observed a significant role played by entrepreneurs, top-level executives, and managers in driving organizational transformation for achieving competitive advantages. This transformative journey involves the creation of CE-friendly ecosystems, the integration of cutting-edge technologies, the recruitment of highly skilled personnel, organizational restructuring, and workforce optimization. It also

encompasses social engagement, HR practices aligned with sustainability, division of labour, and the orchestration of all departments towards circularity and sustainability goals.

Furthermore, this transformation brings about numerous benefits, including the development of a change-oriented mindset through training initiatives, the alignment of pre-existing capabilities with the restructuring process, and the acquisition of new capabilities necessary for the transformation. Training programs are designed to create a versatile workforce capable of handling various products and processes, while available information is utilized to inspire a change in mindset. This training also underscores the need for the integration of micro-level and macro-level approaches in this transformation.

An essential aspect of the transformation process involves reconfiguring business models and organizational procedures, and some entrepreneurs emphasize that restructuring is a continuous endeavour. Specifically, in the pursuit of adopting CE principles, most organizations find themselves at the initial stages of transitioning and gradually incorporating CE principles. In the initial phases, organizations commence by focusing on reducing energy consumption, integrating CE principles within their structure, establishing sustainability objectives, curbing water usage, implementing advanced production processes, adhering to local and international regulations, responding to buyer demands for sustainable production, establishing carbon emission and greenhouse gas (GHG) emission targets for 2050, nurturing a CE-oriented organizational culture, aligning existing competencies with future investments and transformations, and seeking future investments to adapt to changing circumstances and gaining competitive advantages.

Regarding competitive advantages and transformation one of the interviewees from an energy producing company (Case code-11) made the following comments:

*“So, our recent equipment, which is called 9HA, is very much efficient on producing power. So it is much more efficient than the engines and turbines of our competitors, actually. ....Our partners have to be aligned with it and also the subcontractors of our partners and our vendors have to be aligned with it. And also, we are promoting our cleaner technologies. Such as 9HA and clean hydrogen or using renewable energy to generate power. This is the promotion globally.”*

Transformation needs multi-stakeholder support from buyers to consumers to the government. For example, entrepreneurs are getting eco-friendly machinery from suppliers, cleaner technologies from outside the country, policy guidelines from government and environmentalist groups, social support from non-governmental organizations (NGOs), research and development (R&D) support from research institutions and universities, investment supports from bank and financial institutions, awareness supports from social organizations. Interviewee from the head of sustainability of a garments manufacturer organization (Case code-14) indicated regarding transformation and stakeholders as follows:

*“You need to be very keen about your surroundings, what people are thinking, what legislative bodies are thinking, what the other stakeholders are thinking. So, these are the things we need to sense first. We are in a competitive business for our sustainability and for our existence we need to keep changes with the demands. So, what is the demand coming from outside inside to my neighbours inside the country, outside the country. I need to keep this with all those things.”*

According to some entrepreneurs, successful transformation also hinges upon equipping employees with the requisite knowledge and maintaining a proficient human resources base

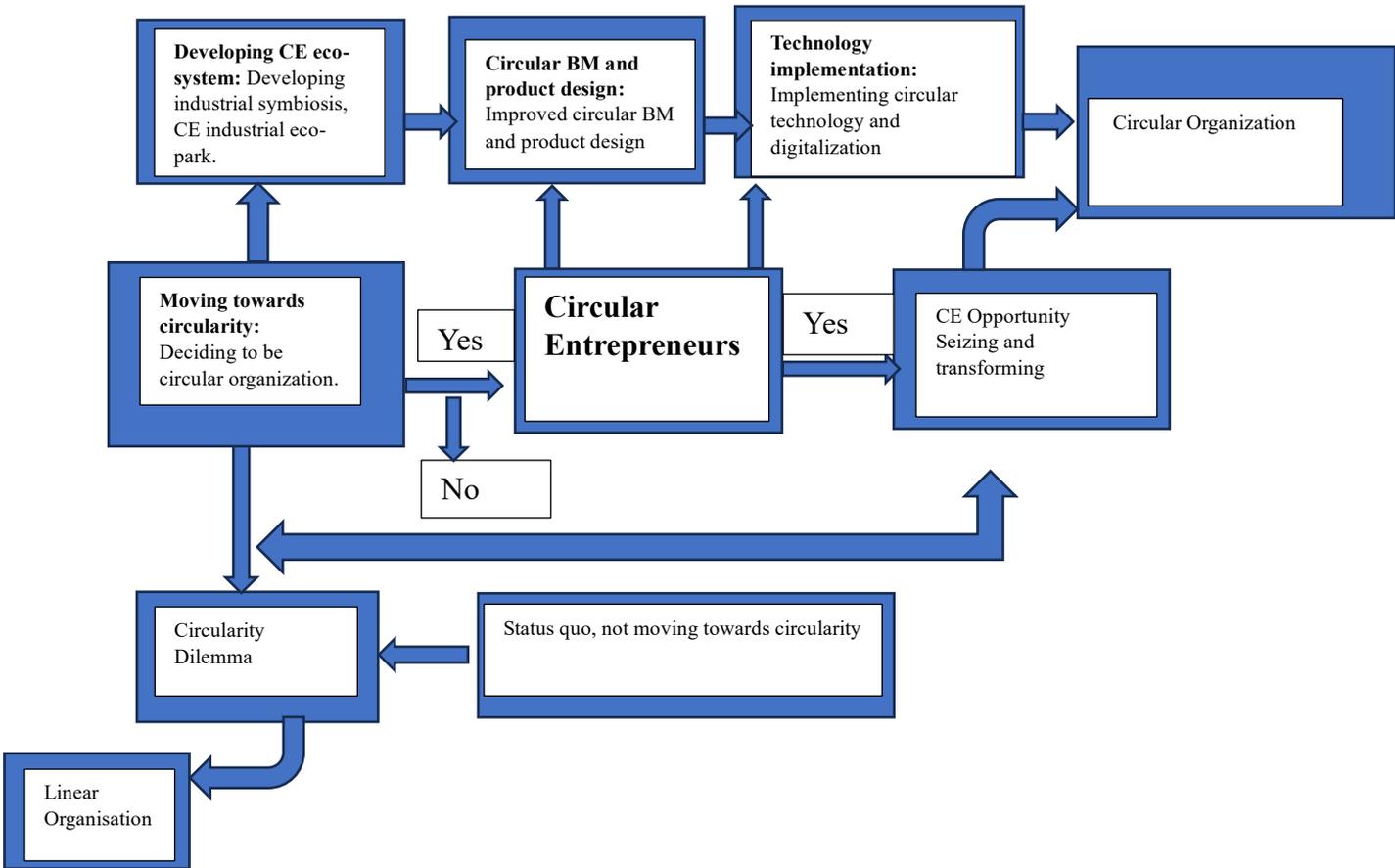
within the organization. Transitioning into a CE is exceedingly challenging without a firm grasp of CE principles and sustainability practices. Entrepreneurs feel there is a pressing need for expert trainers, a resource currently in short supply in the market, to cultivate a knowledgeable workforce.

Some entrepreneurs have expressed the view that the prerequisites for transitioning to circularity must be carefully considered. Nearly unanimous consensus exists regarding the importance of possessing the right mindset to embrace CE principles in order to gain a competitive edge. However, a degree of caution is exhibited by certain entrepreneurs and top-level executives in regard to their level of preparedness. They point out that the scarcity of available technologies and the misalignment of surrounding facilities with circularity adoption pose challenges, casting doubt on their optimism in this endeavour.

**Table 5.: Summary of Transforming and Achieving Efficiency**

Transforming through aligning existing capabilities, investing new capabilities: Example: Case-3, 31, 18, 19.	Transforming through aligning business process, product design. Example: Case-5, 17, 13, 23, 20	Transforming through entrepreneurial strategies. Example: Case-1, 3, 4, 6, 8	Transforming through implementing CE principles, and implementing market standard. Example: Case-1, 21, 30	Transforming through investing in new Technologies and improve efficiencies. Example: Case-1, 6, 10, 11, 14, 27.
Employing skilled manpower, re-sizing manpower, aligning internal people for transformation, redesigning HR, changing mind-set, capacity building for transformation, training for multi-skill, multi-product, multi-process, green financing, low-cost financing (Case-3,	Division of work, all department must be align with transformations, need both micro-macro combinations, we are very much aligned (Case-5), transformation journey of GPH in terms of organizational changes	Implementing sustainability department (Case-1), you have to adjust with demands from societies (Case-6), we have a inbuilt system for transformation (Case-4), we are align, core operational strategies with environment (Case-8), transformation in order to	Transforming through business eco-system, implementing Higg (Case-1), they are practicing CE (Case-21), practicing the CE concept, from my perspective (Case-30),	Requires low-cost technologies, need more technology more knowledge (Case-1), you have to adjust with technology (Case-6), promoting our cleaner technologies, such as 9HA or clean

<p><b>additional interview), our</b> consultant, technical resources, all are capable to do all these things (<b>Case-31</b>), transformation wise, we are aligning with the transformation (<b>Case-18</b>), we have strength and capabilities (<b>Case-19</b>),</p>	<p>and design (<b>Case- 17</b>), Continuous improvement process (<b>Case-13</b>), <b>operation</b> when we continue our operations and make this waste to remove (<b>Case-23</b>), we have adapted in our production process (<b>Case-20</b>)</p>	<p>reduce water and energy consumption (<b>Case-3</b>),</p>		<p>hydrogen (<b>Case-11</b>), we proceed for CE, it involves new technology (<b>Case-14</b>), we are taking initiative some automation, some robotic science (<b>Case-10</b>), the technologies for designing and developing the structure (<b>Case-27</b>),</p>
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**Figure 4.: Circularity Dilemma and Organisational Transformation**

Some interviewees contend that achieving complete transformation necessitates a comprehensive array of elements. These include process enhancements, alterations in product design, shifts in mindset, the avoidance of rigid practices, structural modifications, improvements to the business model, enhanced technical knowledge, the availability of sustainable alternatives for conventional products, the reduction of gaps between organisational capacity and circularity adoption, a skilled human resources workforce, operational enhancements, the cultivation of awareness among employees, and the dissemination of the advantages of circularity among employees, customers, and the general public in order to foster the adoption of circular practices and the development of dynamic capabilities.

However, from the overall findings, it is observed that not all organisations are ready to adopt CE principles. Three categories of organisations are found in our investigation: i) traditional, not concerned with CE, ii) middle of the road, moving towards circularity, and iii) fully circular organisations, adopting CE principles fully. First, traditional organisations are not ready and don't care about CE and recycling their waste. Out of 32 organisations, only three organisations, Case-9 (Building Constructions), Case-25 (Chemical Factory), and Case-32 (Ship Repairing and Building), are not totally ready to move towards CE principles, and they are not ready for that. These types of organisations constitute only 9% of organisations (3 out of 32 organisations) that are not ready to move towards CE principles. However, after knowing CE and interview they are interested to adopt some principles of CE.

On the other hand, only two organisations have already adopted CE principles and are moving towards full circularity. In this category, Case-3 (RMG) and Case-4 (RMG), both organisations have intensive circular practices, comply with international standards, and lead in the RMG

sector in circularity practices and achieve competitive advantages in the market. This type of organisation constitutes only 6% of organisations (2 out of 32 organisations) that are circular in our findings. However, the rest of the organisations (85% organisations, 27 out of 32 organisations) are in the middle of the road or moving toward circularity or practicing some sort of circular practice.

## 4.5 Discussion

### 4.5.1 Entrepreneurial Environmental Scanning and Market Dilemma

Dynamic capability is a pivotal and intricate notion that holds a central position within entrepreneurship and competitive strategy within academic discourse (Zahra et al., 2006). Circular entrepreneurs seek to identify and exploit opportunities, which can be facilitated by reconfiguring a company's resources, thereby enhancing its performance and achieve competitive advantage (Teece et al., 1997). These dynamic capabilities encompass the processes that enable firms to perform consistently and endure over an extended period (Wilden et al., 2013). Dynamic capabilities pertain to the firm's capacity to navigate environmental changes by integrating and modifying its resource base (McKelvie and Davidsson, 2009). Furthermore, dynamic capabilities can be conceived as 'high-order' competencies that empower organisations to leverage their technological potential to gain a competitive edge. This dynamic capability is achieved by effectively allocating resources to meet customers' evolving needs (David et al., 2015).

The primary aspect of exploring and facilitating opportunities within the dynamic capabilities framework is "sensing." Our initial observations noted that CE is prevalent in organisational practices and is primarily associated with sustainability initiatives. Consequently, when entrepreneurs referred to CE in their discussions, they often focused on sustainability and acknowledged that environmental shifts are a principal driver for embracing CE. While theoretical perspectives stress the importance of scanning the business environment, customer observation, collaboration from top management, and recognising social, economic, and environmental opportunities during the sensing stage, circular entrepreneurs predominantly emphasise the significance of environmental changes. Researchers emphasise that public awareness is growing regarding global warming, and entrepreneurs are now becoming more conscious of mitigating climate change and reducing GHG emissions through sustainability practices (Bherwani et al., 2022). In the process of sensing, we also observe that entrepreneurs are sensing these environmental changes and extracting opportunities from such environmental shifts.

Besides environmental changes, another change that dominates sensing CE is technological change. Entrepreneurs now sense that adopting technologies would only be possible to survive in the competition. Digital technologies are especially critical drivers for achieving efficiency and collaboration (Mondal et al., 2023). Almost all the entrepreneurs and top-level executives also agreed that digital technologies will play a key role in moving towards circularity. Researchers also find that circular-related entrepreneurs have a close connection in waste management, where digital technologies can help in improving these waste management activities, especially in manufacturing industries, by reducing waste and monitoring waste, increasing recycling, and helping in better decision-making (Mondal et al., 2023; Sharma et al., 2021). Circular entrepreneurs use digital technologies such as automation, data analytics,

and digital platforms for better decision-making that improves entrepreneurial effectiveness and supports organisational performance (Behl et al., 2022; Mondal et al., 2023).

Entrepreneurs also sense that economic and resource efficiency will be vital in gaining dynamic capabilities and market survival. Hence, they feel that the current BM needs to be changed. As the BM that relates to CE includes principles of CE and supports resource efficiency (Lopez et al., 2019), managers and entrepreneurs are now thinking about moving towards circular BM. Although a widespread understanding of CE is still lacking, a gradual change is imminent in the near future.

In terms of national and international markets, Teece (2007) proposes that firms need to look for different technologies in both local and global markets. Similarly, we find that managers and entrepreneurs are searching for new technologies to adopt sustainability, and they all agree technologies are key drivers for transforming circularity. CE already brought new market opportunities for entrepreneurs, and circular entrepreneurs exploit these markets through R-strategies and keeping economic value in products by extending products' life cycle, trading used goods, and reselling second-hand or used goods (Gessdoerfer et al., 2018; De Jesus et al., 2018; Sehnem et al., 2022). These secondary markets are growing nationally and internationally, and entrepreneurs are sensing that they need to capitalise on this market to gain dynamic capabilities and be competitive.

#### **4.5.2 Entrepreneurial Decisions, Strategies, and Seizing CE Opportunities**

In the early stages of developing dynamic capabilities, researchers observe a practice of resource bricolage (Boccardelli and Magnusson, 2006). This involves the ability to reinterpret

and reconfigure existing resources, aiming to make them better suited to the needs of the market environment (Boccardelli and Magnusson, 2006). This configuration of resources plays a pivotal role in capitalising on opportunities, and circular entrepreneurs contribute significantly to this endeavour. The empirical results of this study, demonstrating the utilisation of organisational restructuring and alterations in business models for seizing opportunities, are consistent with earlier scholarly works (Boccardelli and Magnusson, 2006; Zahra et al., 2006) in which the importance of resource configuration has been highlighted. Although the redesign of products, enhancement of resource efficiency, the pursuit of cost leadership, and the advancement of value creation represent critical objectives, it is worth noting that interviewees express reservations about altering existing product designs due to the requisite technological support and the necessity of approval from top management. Consequently, the process of harnessing dynamic capabilities for exploiting opportunities has been hampered in the current context despite the readiness of circular entrepreneurs to pursue such opportunities.

Recent scholarly investigations in strategic management propose that the evolutionary trajectory of firms is substantively influenced by the interplay between dynamic capabilities and operational competencies (Newy and Zahra, 2009). The primary challenge of acquiring dynamic capabilities by circular entrepreneurs pertains to cultivating operational capabilities and competencies within their organisational framework. Circular entrepreneurs often emphasise the operational dimension as a critical factor in attaining a competitive advantage, mainly when essential tools such as raw materials and operational technologies are not readily accessible. Within the dynamic capability theory context, addressing this challenge constitutes a pivotal juncture that must be resolved to facilitate the transition towards a CE.

The dynamic capabilities serve as a mechanism to mitigate market inertia and market irrelevance, and it explains as the organisational capacity to systematically reconfigure its operational capabilities, enabling the firm to adapt and evolve in response to changing conditions (Newy and Zahra, 2009). Circular entrepreneurs operate within an environment characterised by dynamic and evolving conditions, necessitating the ongoing reconfiguration of their resources and operational capabilities to seize opportunities. Many entrepreneurs and senior executives acknowledge these dynamic aspects of the CE and actively seek to adapt to the evolving circumstances. Consequently, circular entrepreneurs contribute to the development of dynamic capabilities within the domain of the CE.

In CE discourse, entrepreneurial strategies must also be aligned with social and environmental sustainability (Del Vecchio et al., 2020). Our findings also support these alignments. Managers and entrepreneurs indicate that it is essential that entrepreneurs align their strategies with resource allocation to move towards circularity. Circular entrepreneurs also emphasise the importance of R&D strategies because new circular reality requires new product development and design thinking. Some entrepreneurs also shed light on employee training to seize CE opportunities and adjust to the transition process. Industry and entrepreneurs need more trained employees to cope with the CE. Sumter et al. (2020) suggest that to gain competencies in CE, academia, industry, and entrepreneurs must develop and design training programs to meet the growing circularity needs. The government need to support CE initiatives, especially in training programs, and provide funds for training and R&D (Moktadir et al., 2020). Industries also need to come forward to provide CE-related training to their employees for a smooth transition of circularity (Moktadir et al., 2020; Batista et al., 2018).

Managers are dynamic in organisations; however, organisational processes and values are more static and complex to change overnight (Teece, 2016). To seize opportunities, the

organisational process and BM need to be flexible and easily changeable and need to adopt a circular business model (CBM). Entrepreneurs and managers in case firms are ready to adopt new BMs, and some entrepreneurs are proactive and opine that they have an inbuilt system for circularity.

In academic discourse, dynamic capabilities are the deliberate processes of acquiring, transforming, or reconfiguring organisational resources. This concept aligns with the viewpoint presented by Alvarez and Barney (2002), where they explicitly emphasise the central role played by entrepreneurs in resource creation and the novel amalgamation of extant resources. This infusion of entrepreneurial action is consistent with the recommendations put forth by Baker et al. (2003), who propose that organisations can cultivate routines and capacities for improvisation. Such cultivation increases the likelihood of spontaneous resource improvisation and the realisation of their resource value. The core of capitalising on opportunities hinges on the creation and actualisation of resource values. In this context, entrepreneurial strategies, particularly BM transformation, assume a pivotal role. Success for entrepreneurs is contingent upon their ability to overcome inertia, effectuate change in their current BM, and embrace the principles of CE. These principles serve as a pathway towards the attainment of dynamic capabilities.

The responses of competitors are significant in seizing emerging opportunities. Several entrepreneurs agree that in the evolving market landscape, exemplified by the CE paradigm, entrepreneurs are collectively curious about adapting to changing conditions, aiming to secure a dominant position in the market and attain a first-mover advantage. However, intellectual property (IP) assumes a less pronounced role in the present context, given the infrequent

occurrence of innovation within the Bangladeshi business landscape. When innovations do surface, entrepreneurs tend to manage them effectively.

#### 4.5.3 Moving towards Circularity and gaining Competitive Advantages

Business enterprises engage in the cultivation and implementation of diverse, dynamic capabilities; these capabilities and competencies are required for the reconfiguration of a firm's resources and operational processes by the vision and discretion of its primary decision-maker(s) or entrepreneurs (Zahra et al., 2006). The establishment and subsequent utilisation of dynamic capabilities align with the entrepreneur, the entrepreneurial team, or the senior management of the firm and their discernment of prospects to efficaciously alter established operational procedures or resource structures. This is contingent upon their willingness to embark on such modifications and their capacity to effectively implement and execute these transformations (Zahra et al., 2006). These transformations ultimately lead firms to gain competitive advantages in different actors of CE such as digital technologies, resource acquisitions, circular strategies, circular entrepreneurial initiatives.

It is widely acknowledged in the scholarly literature that digital technologies play a pivotal role in facilitating the evolution of the industrial sector, exerting considerable influence over business models and operational paradigms and hence transforming organisations toward CE (Neri et al., 2022). Furthermore, digital technologies are instrumental in enabling and augmenting the dynamic capabilities (Teece, 2018; Neri et al., 2022). A substantial proportion of entrepreneurs have additionally emphasised the imperative for circular entrepreneurs to transition towards the adoption of artificial intelligence, digital technologies, and Industry 4.0 practices. These advancements have been instrumental in rejuvenating their organisational

capabilities, improving competitive advantages and enhancing economic and production-related performance, even when adhering to conventional strategic approaches (Neri et al., 2022). In our findings, we also observe that several companies come forward to adopt technologies and industry 4.0 and they share that these adoptions allow them to minimize cost and increase efficiency and ultimately improve competitiveness in the market.

Circular entrepreneurs emphasise the digital technologies that facilitate transition and transformation towards the adoption of CE practices, resulting in the emergence of four distinct micro-foundations, according to Neri et al. (2022). Neri et al. (2022) stated that the first micro-foundation revolves around imposing stringent control measures over the **production processes** to align **them with CE principles**. Similarly, the second micro-foundation centres on **traceability**, wherein digital technologies empower firms to effectively track the **movement of materials**, products, and processes throughout the production chain. Similarly, the third micro-foundation pertains to the **transformative alterations** within the **production processes that align with CE principles**. Notably, digital technologies, such as the Internet of Things (IoT), robotics, and simulation technologies, facilitate the development of this transformative capacity (Neri et al., 2023; 2024). The fourth and final **micro-foundation is characterised by the emphasis on future and ongoing projects and investments undertaken** by the surveyed firms at the time of the investigation ((Neri et al., 2023;2024). These initiatives primarily involve deploying big data and analytics to curtail material consumption and minimise **production waste** (Neri et al., 2023;2024).

In our findings, we have found that only few companies use AI, however, most of the garment's factories use digital product design and hence minimize time and improve efficiency. Significantly, our research results are consistent with the primary micro-foundation, wherein

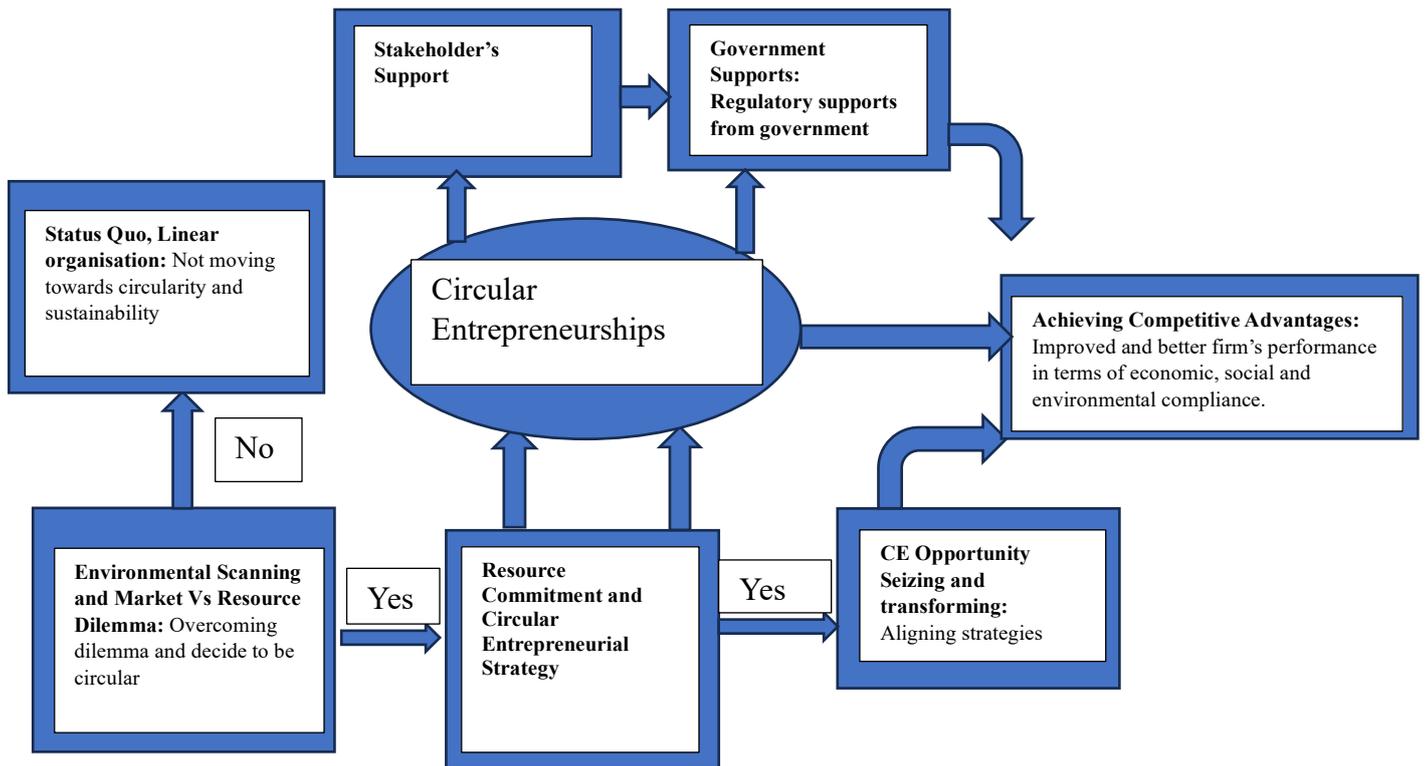
circular entrepreneurs effectively oversee the production process by adapting to CE principles. Nevertheless, it is noteworthy that most entrepreneurs needed help to conform to the secondary micro-foundation, as they encountered challenges in providing a clear account of the traceability of materials, products, and waste within their operations. Conversely, our investigation revealed a consonance between the third and fourth micro-foundations and the ongoing initiatives adopted by entrepreneurs in pursuit of dynamic capabilities and competitive advantages. Most of the surveyed firms are ready to align resources for ongoing projects and take the initiative for future investment to transform into circularity despite their technological and financial scarcity.

Within the business model transformation process, diversifying the BMs is crucial, requiring the active involvement and support of entrepreneurs, CEOs, and top-level executives (Santa-Maria et al., 2021). It is noteworthy that managers also seek similar types of support and have articulated their concerns regarding the provision of such support for the transformation of the BM. In conjunction with transforming the business model (BM), the individual firm's transition towards CE is equally paramount at the micro-level (Coppola et al., 2022). Furthermore, some researchers have contended that the process of BM transformation should be harmonised with the overarching organisational strategy to acquire dynamic capabilities. This entails the formulation, fine-tuning, and execution of the business model (De Angelis et al., 2023). According to Teece (2018), these dynamic capabilities are the resulting outcomes of this strategic alignment. Most interviewees agreed that strategic alignment and BM transformation must be harmonised for organisational transformation and to achieve competitive advantage. Implementing digital transformation is paramount in transforming to CE, and circular entrepreneurs are gradually adopting and implementing digital transformation with data-driven capabilities. This digital transformation entails reconfiguring and rethinking value

propositions and creating data-driven that provide decision-makers with generated decision-making instead of instinct decisions (Kristoffersen et al., 2020). This need investing in new digital technologies and upgrading existing technological capabilities. Our case firms confirm that they continuously upgrade their digital technologies and acquire new technologies, such as IoT and robotics, to adapt to CE principles and to gain competitive advantage in the market

Achieving competitive advantage and transforming also require reconfiguring the organisation's tangible and intangible resources (Teece, 2007), avoiding the organisation's inertia (Kump et al., 2019). These also require new BM, product design, and product innovation by restructuring and providing proper logistical support, infrastructure, and HR support with a skilled workforce (Kump et al., 2019). Transforming entails regenerating strategic decisions with reconfiguring processes and resources (Teece 2007). In this context, both existing entrepreneurs and circular entrepreneurs are now thinking of changing their strategic decisions to adopt CE principles by aligning customers' demands. Transformation also indicates successful implementation of existing capacity that requires corporate-level strategies and realigning managerial processes (Li and Liu, 2014 ; Kump et al., 2019). We also observe that managers employ a gradually skilled workforce, open sustainability departments that were absent earlier, redesign the HR department, improve capacity building, and employ multi-skilled people that ensure corporate-level strategies for a smooth transition from a linear economy to CE that eventually provide competitive advantages to the firm. For the transformation of dynamic capacity, it is important to complement the current capabilities by accessing new resources or building new resources aligned with the organisation's digital strategies (Rindova et al., 2016).

### Macro Model: Final Research Framework Based on Findings



**Figure 5. Gaining Competitive Advantage by Capitalising on Circular Economy Opportunities**

The overall macro-model depicts how circular entrepreneurships help circular entrepreneurs to gain competitive advantages. While circular entrepreneurs scanning the environment and monitoring the changes they identify two major discourses such as market discourses and resource discourses. The details of these discourses already discuss in the previous chapters. At this junction, if circular entrepreneurs decide to move towards circularity and sustainability with resource commitment, then they gradually move towards seizing process achieving DC in

seizing stage. However, as discussed before, not all entrepreneurs move towards circularity and hence some entrepreneurs maintain status quo. While circular entrepreneurs achieve proper DC at seizing stage, they modify traditional BM model and adopt CBM along with stakeholders and government supports that lead them move towards transformation process. In transformation process, circular entrepreneurs align existing resources with required resources, if necessary, invest in additional capabilities such as acquiring proper technologies, digitalisation that facilitate smooth transition towards circularity. Once they become circular organisation, they enjoy competitive advantage and ensure better firm performance in economically, socially and environmentally.

#### 4.6 Managerial Implications

The current research has numerous managerial implications. For instance, entrepreneurs and managers intending to move towards CE must consider DC for achieving competitive advantage. In achieving competitive advantage, entrepreneurs and managers must systematically follow the process of dynamic capabilities, sensing, seizing, and transforming. In the case of environmental scanning, managers must carefully monitor the environmental changes where both natural and business environments must take into account. Most managers agree that climate change is happening and human intervention in nature is now causing global warming. However, humans can tackle this eminent climate disaster by adopting sustainable production and consumption. CE is a tool that can support tackling climate change. So, the manager must adopt CE principles in their productions and consumption to tackle global warming. Managers also closely look into the overall business environment and how the competitors adopting CE principles and gaining competitive advantages. To adjust to the

current market situation, meet customers' demands, and gain dynamic capabilities, managers must also take the leadership role that ensures sustainability in their operations.

In the case of seizing the opportunities, managers and entrepreneurs need to redesign their organizations, adopt CBM, improve value creation and adopt new technology, which is very important in entrepreneurial strategies. Similarly, in the transforming stage, managers must implement CE principles considering existing capabilities and, if possible, investing in new capabilities. Managers also cautiously look into the alignment of business processes and corporate strategies and match them with entrepreneurial strategies for gaining competitive advantages.

Entrepreneurs and managers interested in transitioning to CE practices can get direction from our research by providing strategies to move towards circularity and sustainability. Furthermore, our study can guide managers in manufacturing companies to develop new BMs that support CE principles. In CE transitions, BM or CBM plays a pivotal role, and managers need to rethink their existing BMs. They need to revamp their traditional BMs and adopt CBM to gain competitive advantages.

#### 4.7 Policy Implications

Within the DC framework, the policy implications are multi-layered, necessitating integration across individual, organisational, national, and international levels. This study explores policy evolution from both CE and circular entrepreneurship perspectives. At the local level within the CE framework, policymakers should prioritise R-strategies (reduce, re-use, recycle, and remanufacture) while aligning these strategies with public procurement policies (such as green

procurement) and managing secondary product markets. From an international CE perspective, policy evolution focuses on resource efficiency, driven by the global demand for environmentally friendly products (European Commission, 2015b). In the context of circular entrepreneurship, policy development must support the creation of an entrepreneurial ecosystem with both short-term and long-term measures. Short-term strategies may include providing subsidies, tax exemptions, and expanding governmental facilities, whereas long-term approaches should focus on training, development, and research and development (R&D) to sustain entrepreneurial growth. Additionally, policymakers should promote the transition from a linear to a circular model by integrating all stakeholders and encouraging practices that advance CE and sustainability.

Policymakers must enhance eco-economic policies that promote economic efficiency, sustainability, economic growth, environmental well-being, and a harmonious relationship between nature and humanity (Sarkis and Zhu, 2008). To achieve these objectives and maintain economic efficiency, policymakers should design economic policies that support circular entrepreneurs. The primary aim of CE policy should be to encourage entrepreneurs and organisations to utilise natural resources sustainably and to internalise environmental costs into organisational expenses (Yong, 2007). Additionally, policymakers and governments should assist small and medium-sized enterprises (SMEs) in adopting CE principles. For larger organisations, it is essential to impose or encourage adherence to various national and international standards, such as ISO 14000 or ISO 14001, to ensure compliance with environmental best practices (Sarkis and Zhu, 2008).

Some scholars advocate for the adoption of local-level policies that involve local administrations in environmental governance (Allen et al., 2019). Concurrently, regional initiatives, such as industrial development that accounts for environmental considerations, are

also vital. Governments should promote the sustainable use of energy when formulating industrial policies, as these policies can ensure sustainability and contribute to achieving a nation's sustainable development goals (Shittu, 2020). Furthermore, governments should design industrial policies to enhance organisational capabilities through research and development (R&D), technology transfer, and increased investment in innovation (Labory and Bianchi, 2021). Organisational innovation and transformation are attainable when companies adopt technologies and IT-based governance systems that open up new opportunities and competencies (Luna-Reyes et al., 2020). Organisations can enhance their capabilities through the availability of infrastructure, tax incentives, skilled labour, reliable suppliers, and by implementing integrated and balanced policies (Lessard et al., 2016).

Organisations can also co-create value by collaborating with public administration and enhancing eGovernment, which will strengthen Dynamic Capabilities (DCs) and enable organisations to seize new opportunities (Panagiotopoulos et al., 2023). DCs are regarded as critical success factors for the public sector, as they help address environmental challenges and generate public value for key stakeholders by navigating both internal and external challenges. To improve long-term capacities within the public sector, ministries or policymakers should increase funding for IT and enhance managerial skills (Panagiotopoulos et al., 2023).

#### 4.8 Theoretical Contributions

The primary theoretical contribution of the study resides in its identification of various dynamic capabilities within the literature on circular entrepreneurship. To the best of the researcher's knowledge, this study is the first to explore dynamic capabilities in terms of sensing, seizing, and transforming within the context of circular entrepreneurship.

Additionally, the researcher integrates dynamic capabilities theory with entrepreneurial theories, circular entrepreneurship concepts, and CE opportunities. This integration deepens our understanding of how circular entrepreneurs engage with and address the distinct components of dynamic capabilities, formulating strategies to sense, seize, and transform organisations. Within the context of CE, entrepreneurs consistently pursue opportunities that are intertwined with environmental challenges, aligning their business strategies accordingly to adapt to these changes. Entrepreneurs also continuously update their business models and resources (Audretsch and Fiedler, 2024) to adapt to and capitalise on CE opportunities.

A further theoretical contribution of this paper is its expansion of the circular entrepreneurship literature, providing insights into the various capabilities that circular entrepreneurs engage with when implementing circular economy (CE) principles. The research elucidates key capabilities and strategies essential for overcoming challenges in the transition to circular entrepreneurship and the adoption of CE principles. For instance, in the discourse on resources, circular entrepreneurs determine resource allocation, which facilitates the adoption of technology and ultimately advances circularity. Additionally, this study presents a framework to assist researchers in navigating the critical capabilities within circular entrepreneurship contexts.

This study also explores new variables within the framework of circular entrepreneurship and the CE. The researcher identifies variables linked to environmental discourse, including CE standards, international standards, market demand, and buyer pressures. In the realm of resource discourse, the variables encompass resource commitment, technology adoption, CE ecosystems, and circular BM, all of which contribute to advancing circular organisations. To secure a competitive advantage, circular entrepreneurship relies on variables such as stakeholder support and government backing, which are crucial for transitioning to a CE. These variables are fundamental to both circular entrepreneurship and CE transformation, and this

paper provides an in-depth analysis of them within the Bangladeshi context. The discussion of these variables in relation to Bangladesh offers a novel contribution to the CE literature.

#### 4.9 Conclusion, Limitations and Future Research Directions

An expanding body of scholarly research highlights the significance of entrepreneurial endeavours in the development of dynamic capabilities in gaining competitive advantages within both nascent enterprises and well-established corporations. Against this backdrop, this study endeavours to examine entrepreneurial undertakings, with a particular focus on circular entrepreneurs, aimed at acquiring competitive advantages through the adoption of CE principles. Our research empirically encompasses both long-standing enterprises and newly established circular businesses to investigate how circular entrepreneurs can cultivate firm's performance and competitive advantages. Competitive advantage is achieved by identifying circular opportunities facilitated by technological advancements, business model transformation, product design enhancements, resource reconfiguration, aligning resources with strategic objectives, and investments in additional capabilities.

The present research offers several noteworthy contributions to the contemporary literature on circular entrepreneurs in addition to the contribution mentioned earlier. Firstly, it is believed to be the first investigation into circular entrepreneurs from the perspective of dynamic capabilities theory and competitive advantage. To our knowledge, no other research till date has empirically explored the domain of circular entrepreneurs while employing the dynamic capabilities theory framework to understand how firms can achieve competitive advantages.

Secondly, the study empirically delineates how circular entrepreneurs discern their environmental context, engage in environmental scanning to identify opportunities derived from CE principles and leverage these opportunities to attain dynamic capabilities.

Lastly, this investigation amalgamates critical elements of the dynamic capability theory, precisely the facets of sensing, seizing, and transforming, within CE principles. It elucidates the path for circular entrepreneurs to acquire dynamic capabilities and achieve a competitive advantage, mainly focusing on resource reconfigurations and BM transformation.

Notwithstanding the novel contributions made by this research, it is essential to acknowledge its inherent limitations. Firstly, the study was constrained by a qualitative interview sample size of 32 case companies, which was restricted exclusively to the Bangladeshi context. The limitation is further compounded by the fact that the topics of dynamic capability and CE, which form the core of the investigation, are relatively emergent and evolving. Few companies and entrepreneurs are aware of these concepts although they are practicing these in their organisations. Consequently, identifying participants possessing adequate knowledge in these areas proved to be a formidable challenge. Subsequent research endeavours may mitigate this limitation by expanding the participant pool to encompass a more diverse array of industries and countries, thereby fostering a broader perspective on the subject matter.

Secondly, this study is constrained by its exclusive reliance on qualitative research methods. Subsequent research endeavours should employ qualitative and quantitative approaches to attain more thorough insights from the research field. Furthermore, the present investigation exclusively centres on technical cycles and circular entrepreneurship within manufacturing organizations. Hence, future research should broaden its scope to encompass biological cycles,

thereby addressing additional sustainability and circularity dimensions to enhance the findings' generalizability. Additionally, forthcoming research can investigate into a more extensive array of variables pertinent to entrepreneurship and explore mediating and moderating relationships, yielding more profound insights. Moreover, future research can adopt a specialized industry-oriented approach, shifting the focus from a general industrial perspective to gain a more nuanced understanding of the issues.

## Chapter Five

### 5. Conclusions

Research on circular entrepreneurship is in its early stages and expanding gradually. There is a limited amount of research specifically addressing circular entrepreneurship. As an emerging field, circular entrepreneurship necessitates the development of theoretical and conceptual frameworks to advance its study. To date, research in this area has been sporadic, lacking robust models to guide inquiry. The current study addresses this significant gap. To minimise this research gap, the researcher conducted a comprehensive literature review to understand current trends in circular entrepreneurship research. By synthesising existing studies, the researcher developed a circular entrepreneurship model aimed at guiding future entrepreneurs in adopting CE principles.

To transition from a linear entrepreneurial model toward a journey to a circular entrepreneurship model, circular entrepreneurs must resolve several tensions that require clarification.

These tensions and paradoxes present contradictory issues that circular entrepreneurs need to resolve. The second chapter (paper 2) tackles these issues and resolves the main paradoxes by formulating specific strategies. Additionally, the third chapter (paper 3) focuses on dynamic capabilities that facilitate the transition towards circular entrepreneurship. This chapter demonstrates how circular entrepreneurs use sensing, seizing, and transforming to modify existing capabilities, develop new ones, and ultimately gain competitive advantages.

The specific conclusions of main chapters are provided in the following:

## 5.1 Findings and Synthesis of Circular Entrepreneurship

### 5.1.1 Developing Circular Entrepreneurship Model

The first paper introduces a circular entrepreneurship model based on systematic literature reviews, synthesising existing research on the circular economy, circular entrepreneurship, circular start-up, business model, circular business model, circular supply chain, sustainable entrepreneurship and entrepreneurship. The primary objective of this paper is to examine the circular entrepreneurship process through an SLR and propose a model for circular entrepreneurship. Although the literature on circular entrepreneurship is limited (Suchek et al., 2022), our analysis reveals the absence of SLRs on this subject and the lack of comprehensive models that address the antecedents, elements, and outcomes of circular entrepreneurship.

The paper's main finding is a circular entrepreneurship model structured across three levels: micro, meso, and macro. At the micro level, it involves a company's mission, vision, strategies, leadership, and risk-taking in alignment with CE principles. The meso level focuses on building partnerships and collaborations, while the macro level considers regional, national, and international factors. Together, these levels guide entrepreneurs in shaping business models that achieve economic, social, and environmental sustainability. While there is a recognised gap between sustainable entrepreneurship and environmental entrepreneurship (Filser et al., 2019), this gap can be narrowed by developing a research model that builds upon current studies and integrates concepts from CE-related disciplines.

### 5.1.2 Understanding Circular Entrepreneurship's Paradoxes and Tensions

Paper-2 primarily examines the various paradoxes faced by circular entrepreneurs. As circular entrepreneurship is a relatively new concept, it is inevitable that numerous tensions and contradictions will arise during the adoption of CE practices. This study identifies three key paradoxes encountered by circular entrepreneurs in their transition towards CE: the waste-resource paradox, market paradoxes, and stakeholder paradoxes. The paper also outlines several strategies to mitigate these paradoxes, facilitating the effective adoption of CE principles.

In a dynamic environment, circular entrepreneurs must innovate, use resources efficiently, and offer sustainable products while addressing internal and external tensions. The key research question focuses on identifying the main paradoxes circular entrepreneurs encounter when implementing CE principles in their operations. The second paper also contributes by identifying the various paradoxes faced by circular entrepreneurs during their transition to a CE. Transitioning towards a CE has become a key priority for entrepreneurs, driven by the pressure from international buyers to adopt CE principles as a means to address carbon emissions and promote environmental restoration. Additionally, there is currently a gap in the literature that connects CE with the concept of paradoxes, failing to offer entrepreneurs insight into the paradoxes and tensions they encounter.

Field data reveals a key paradox among entrepreneurs regarding waste perception. While some view waste as a valuable resource, others hesitate to use it, fearing it may shift their business focus and increase costs. Many entrepreneurs find waste management unprofitable and pass it to third parties. Additionally, market demands create tensions between price and quality, intensifying production pressures. Entrepreneurs struggle with challenges related to technology

and investment, particularly the need for specialised technologies for recycling, which are often unavailable.

**Waste-Resource Paradox:** For the waste-resource paradox, entrepreneurs must reconceptualise waste as a resource and develop methods to transform it into valuable inputs. The central issue is whether entrepreneurs see waste as a problem or resource. To resolve this, they must adopt R-strategies—reduce, recycle, reuse, refurbish, and remanufacture—which are vital for progressing toward a CE. Implementing these strategies is essential for overcoming the waste-resource paradox.

**Market Paradox:** Market tensions focus on two paradoxes: quality and price. While higher quality usually increases costs, consumers in recycling contexts resist paying more for recycled products. Manufacturers struggle to maintain quality when mixing recycled and virgin materials, with recycling sometimes degrading material quality, especially in metals. To address these tensions, the researcher suggests developing an industrial symbiosis (IS) and ecosystem, which would provide high-quality raw materials and encourage collaboration within the recycling industry.

**Stakeholder Paradox:** Stakeholder paradoxes occur when internal and external stakeholders differ in their priorities for adopting CE principles. Internal stakeholders often focus on financial benefits, while external stakeholders emphasise environmental concerns, creating tensions for entrepreneurs. To address this, entrepreneurs should reduce resistance to change by educating internal stakeholders on environmental issues and involving them in sustainable policy-making. Additionally, in countries like Bangladesh, an underdeveloped supply chain ecosystem, with shortages of recycled materials and reliance on imports, further impedes CE progress. So, circular entrepreneurs need to develop circular supply chain ecosystem to transition to a circular organisation and hence to overcome stakeholders' tensions.

### 5.1.3 Transforming Towards Circular Entrepreneurial Organisation for Achieving Competitive Advantages

Third paper aims to investigate how circular entrepreneurs in emerging economies, like Bangladesh, can achieve competitive advantage through DC, while addressing tensions related to CE practices. It fills a gap in the literature by applying DC theory—focusing on sensing, seizing, and transforming capabilities—to circular entrepreneurship. Despite ongoing debate on the role of DC in gaining competitive advantage (Helfat et al., 2007; Teece, 2007), this research seeks to provide empirical evidence on how circular entrepreneurs can navigate environmental challenges and secure a competitive edge. The central question revolves around how these entrepreneurs can leverage DC to mitigate CE tensions and gain advantage (Helfat et al., 2007; Teece, 2007).

The findings are discussed in relation to the three components of DC theory: sensing, seizing, and transforming.

**DC and Sensing:** In the "sensing" component, researchers identified two key categories: environmental discourse and resource discourse. Circular entrepreneurs' approaches to sensing environmental changes varied among interviewees. Most noted an awareness of recent environmental swings, such as water scarcity, increased salinity, and changes in air and water quality. These changes, driven by climate change, are prompting companies to adapt their production processes, with circular entrepreneurs increasingly incorporating environmental concerns to remain competitive in the market.

Under environmental discourse, one of the major elements of the environment in CE context is **market discourse**. In the context of market discourse, changes are seen in areas such as market evolution, dilemmas, and buyer pressures. Key trends include increasing demand for sustainable and biodegradable products, rising consumer awareness, and stakeholder influence on environmental sustainability. Interviewees highlighted the competitive advantages for organizations that adopt CE principles by 2025 or 2030. These market shifts, observed through various channels like social media, newspapers, and buyer behaviour, emphasize the growing demand for recycled materials, renewable energy, and sustainability-driven strategies, with major corporations adopting recycling-focused business models.

In **resource discourse**, in the context of CE, circular entrepreneurs must decide whether to treat waste as a resource or discard it, creating tension. The research shows that those who view waste as a resource gain a competitive edge by reconfiguring designs, adopting circular practices, leveraging technology, and integrating sustainability. These actions, including repurposing waste and innovating processes, lead to superior performance and market leadership.

**DC and Seizing:** The second component of dynamic capability focuses on how circular entrepreneurs seize opportunities in the CE. They redesign their organizations, align products with market standards, and transform business models to incorporate circular practices. Enhancing product value through resource efficiency requires adopting new technologies and integrating digitalization across all processes.

**DC and Transforming:** The final component of dynamic capability is transformation, which entails the development of ecosystems conducive to the CE, the incorporation of advanced technologies, the recruitment of highly skilled personnel, and the restructuring and

optimisation of the workforce. It also includes fostering social engagement, implementing human resource practices that align with sustainability, and coordinating the division of labour and departmental efforts towards achieving circularity and sustainability objectives. These transformative initiatives are essential for securing competitive advantages.

## 5.2 Theoretical Contributions

### 5.2.1 Theoretical Contributions of Circular Entrepreneurship Model

Theoretical contributions from the systematic literature review (SLR) on the circular economy (CE) and circular entrepreneurship provide pioneering insights, particularly given that circular entrepreneurship is still in its nascent stage of development. In recent years, the CE has attracted substantial attention from scholars, both in terms of its theoretical underpinnings and practical implementation strategies (Geissdoerfer et al., 2016), which have, in turn, spurred research into circular entrepreneurship.

Prior to 2000s, the CE was not recognised as a distinct research field; instead, its principles were scattered across various disciplines (Merli et al., 2018), such as industrial ecology, environmental sustainability, and engineering fields related to recycling and upcycling, reflecting a wide range of antecedents (Bocken et al., 2017). These intellectual traditions have contributed to the emergence of circular entrepreneurship literature, highlighting the need for a model that defines the novel framework of circular entrepreneurship. Consequently, the first theoretical contribution of this SLR is the development of a model that outlines the antecedents, components, and outcomes of circular entrepreneurship.

Secondly, this model encourages researchers to examine the challenges faced by circular entrepreneurs through an empirical perspective, offering meaningful recommendations for

overcoming these obstacles. Thus, the second theoretical contribution involves integrating the issues of CE with related entrepreneurial literature that remains underexplored, urging researchers to empirically investigate circular entrepreneurship.

Thirdly, by synthesising the existing literature on CE, this research seeks to advance theory-building for future scholars in the fields of CE and circular entrepreneurship, thereby enhancing the conceptual clarity of circular entrepreneurship.

Lastly, this theoretical framework will aid scholars, researchers, and policymakers in promoting further research and generating new ideas in the domains of environmental management, sustainability, and circularity

### 5.2.2 Theoretical Contributions for Paradox in Circular Entrepreneurship

The first theoretical contribution of second paper lies in its identification of several paradoxes within the circular entrepreneurship literature. For the first time, this study explores resource paradoxes, market paradoxes, and stakeholder paradoxes in the context of circular entrepreneurship. Secondly, the research connects paradox theory with entrepreneurial theories and CE opportunities, enhancing our understanding of how circular entrepreneurs confront and address these paradoxes, and develop strategies to resolve them. In the CE context, entrepreneurs continuously seek opportunities that are linked to environmental challenges, which inherently give rise to tensions and paradoxes. Entrepreneurs adapt their knowledge and resources (Audretsch and Fiedler, 2024) to capitalise on CE opportunities, thereby alleviating these tensions.

The third theoretical contribution of this paper extends the circular entrepreneurship literature by providing insights into the various tensions that circular entrepreneurs face when implementing CE principles. The research highlights critical paradoxes and strategies for

overcoming them. For instance, while waste-resource paradoxes (Greer et al., 2021) have been discussed in the existing literature, there is still limited understanding of how circular entrepreneurs manage these paradoxes in their production and operational processes. This study offers a framework to guide researchers in navigating the significant paradoxes in CE contexts.

Moreover, this study examines new variables within the framework of CE and circular entrepreneurship. The researcher identifies variables related to waste-resource paradoxes, such as R-strategies. In relation to market paradoxes, key variables are identified as essential for the transition to a CE, including pricing, quality, production and operations, technology, and investment. These variables are crucial for both circular entrepreneurship and CE transformation, and this paper provides an in-depth analysis of these factors within the Bangladeshi context. Addressing these variables in the context of Bangladesh, an emerging nation in South Asia, marks a novel contribution to the CE literature. In terms of stakeholder paradoxes, the research identifies critical variables, distinguishing between internal and external stakeholders. Internal stakeholders are directly affected by the CE transition, whereas external stakeholders are those who implement regulations and policies to facilitate CE adoption. Previous studies on circular entrepreneurship have not sufficiently articulated these aspects, making these variables a significant contribution of this research.

### 5.2.3 Theoretical Contributions of Dynamic Capability in Circular Entrepreneurship

The principal theoretical contribution of Paper-3 lies in its identification of various dynamic capabilities within the circular entrepreneurship literature. To the best of the researcher's knowledge, this study is the first to examine dynamic capabilities in terms of sensing, seizing, and transforming in the context of circular entrepreneurship.

Moreover, the researcher integrates dynamic capabilities theory with entrepreneurial theories, circular entrepreneurship concepts, and circular economy (CE) opportunities. This integration enhances our understanding of how circular entrepreneurs engage with and address the distinct elements of dynamic capabilities, developing strategies to sense, seize, and transform their organisations. In the context of CE, entrepreneurs continuously seek opportunities interwoven with environmental challenges, adjusting their business strategies to accommodate these changes. They also consistently update their business models and resources (Audretsch and Fiedler, 2024) to adapt to and leverage CE opportunities.

A further theoretical contribution of this paper is its expansion of the circular entrepreneurship literature, offering insights into the various capabilities that circular entrepreneurs utilise when applying CE principles. The research highlights the essential capabilities and strategies needed to overcome challenges during the transition to circular entrepreneurship and CE adoption. For example, in the discussion on resources, circular entrepreneurs manage resource allocation to facilitate technology adoption, thereby promoting circularity. Additionally, the study provides a framework that assists researchers in navigating the critical capabilities within circular entrepreneurship contexts.

This research also investigates new variables within the framework of circular entrepreneurship and the CE. The researcher identifies variables linked to environmental discourse, such as CE standards, international standards, market demand, and buyer pressures. In the resource discourse, variables include resource commitment, technology adoption, CE ecosystems, and circular business models, all of which contribute to the development of circular organisations. To achieve competitive advantage, circular entrepreneurship depends on variables such as stakeholder support and government backing, which are essential for transitioning to a CE.

These variables are key to both circular entrepreneurship and CE transformation, and this paper offers a detailed analysis of them in the Bangladeshi context. The exploration of these variables in relation to Bangladesh represents a novel contribution to the CE literature

## 5.3 Managerial Implications

### 5.3.1 Managerial Implications in Developing Circular Entrepreneurship Model

While a SLR primarily focuses on theoretical contributions, it can also offer valuable managerial insights. The SLR model presented provides a practical framework for managers and entrepreneurs transitioning to a CE by identifying key antecedents, elements, and outcomes. The model categorises antecedents at the micro, meso, and macro levels, enabling managers to identify and leverage these factors to transform their existing business models towards circularity. Managers, in micro-level can formulate their missions, visions, leadership based on CE principle and remove their linear thinking and overcome linear status quo. In meso-level, managers must develop partnership with other circular organisations, develop their own circular supply chain, and make collaboration with other stakeholders those promote CE. In macro level, manager must adapt national and international standards of CE and must update their knowledge regarding the changes in sustainability and circularity regulations. This model will guide managers to look at issues in these three levels while practicing CE principle within their organisations and hence achieving their social, economic and environmental sustainability in both departmental and organisational level.

The model also outlines essential elements for circular managers, such as adapting business models, circular supply chains, digitalisation, value creation, and risk management. These

components are vital for a successful transition to CE, ultimately leading to enhanced social, economic, and environmental performance. This model thus serves as a comprehensive guide for achieving sustainability objectives through circular entrepreneurship.

### 5.3.2 Managerial Implications in Resolving Paradoxes

2<sup>nd</sup> paper offers important managerial insights by applying Paradox Theory to demonstrate how tensions within organisations can be minimised or mitigated in the transition to a CE. While previous studies have focused on circular business models, product design, and supply chains, they have largely overlooked the contradictions and tensions that arise during this transition. This study addresses this gap, providing strategies for managers to mitigate these tensions by adopting circular approaches.

Unlike prior research, which primarily emphasises waste management, this study highlights resource tensions and proposes strategies for managers to shift from viewing waste as a problem to recognising it as a resource. Additionally, managers must overcome their resistance to market paradoxes and prioritise investment in circular products. This paper also stresses the need to raise stakeholder awareness and address tensions related to CE paradoxes, particularly in areas like investment and technology adoption.

The research recommends that managers can create an enabling environment to support the shift toward circularity and sustainability. Managers, in particular, should offer logistical support to facilitate this transition, including simplifying regulations around importing recycled and sustainable raw materials.

### 5.3.3 Managerial Implication in Sensing, Seizing and Transforming in Circular Entrepreneurship

Paper-3 offers significant managerial insights, emphasising the importance of DC for achieving competitive advantage when transitioning to a CE. Entrepreneurs and managers must systematically apply the DC process of sensing, seizing, and transforming. Effective environmental scanning is critical, as both natural and business environments must be considered. Many managers acknowledge the impact of human activity on climate change, and adopting sustainable production and consumption practices, such as CE, is essential for addressing global warming. Managers must integrate CE principles into their operations and closely monitor competitors who do the same.

In seizing opportunities, managers and entrepreneurs should redesign their organisations, adopt circular business models (CBM), enhance value creation, and embrace new technologies. During the transformation phase, aligning CE principles with existing capabilities—and, where necessary, investing in new ones—is key. Business processes and corporate strategies must also align with entrepreneurial strategies to ensure competitive advantage.

The study provides practical guidance for entrepreneurs and managers seeking to transition to CE practices, offering strategies for circularity and sustainability. Additionally, it highlights the need for manufacturing firms to rethink and redesign their traditional business models in favour of CBMs to stay competitive.

## 5.4 Policy Implications

### 5.4.1. Policy Implications in Developing Circular Entrepreneurships

A considerable research gap remains in understanding how policies can support the transition to a CE within the built environment (Yu et al., 2022). Developing a comprehensive model could significantly assist researchers, policymakers, entrepreneurs, and managers in addressing this gap. In response, this research presents a circular entrepreneurship model grounded in existing CE literature, designed to guide future entrepreneurs and policymakers in adopting CE principles and transitioning to a circular economy.

Policymakers must consider micro, meso, and macro-level components of circular entrepreneurship when formulating policy. At the micro level, they can guide managers and circular entrepreneurs in shaping their missions, visions, and strategies, ensuring alignment with national environmental regulations. Additionally, policymakers can offer guidelines for developing circular business models, digitalisation, and value creation.

At the meso level, policymakers can provide frameworks for circular entrepreneurs to form partnerships with various stakeholders, establish strategic and cross-sectoral collaborations, and develop industrial symbiosis. At the macro level, they can encourage adherence to national and international standards that support CE and promote environmental regulations.

Key considerations for policymakers include circular business models, circular start-ups, circular supply chains, circular ecosystems, eco-industrial parks, and the legal framework of the country when providing guidelines for CE transition.

### 5.4.2 Policy Implication in Minimising Tensions

Policymakers can adopt several strategies to support the transition to circular entrepreneurship and address related paradoxes. One key approach is the implementation of eco-design strategies, where producers integrate environmental factors into product development, balancing ecological and economic needs. Economic subsidies, such as tax relief or financial incentives, can further stimulate business growth and ease financial constraints.

Governments could also adopt green fiscal and monetary policies, including green taxes, to promote sustainable economic practices. Another option is the 'end-of-waste' strategy, which repurposes waste as raw materials, with policymakers providing guidelines to mitigate conflicts from the waste-resource paradox.

Technological support can help circular entrepreneurs transition smoothly to a circular economy, while industrial symbiosis can be encouraged, where waste from one industry serves as input for another. The 'polluter pays' principle, requiring polluters to bear the costs of environmental damage, is another policy option. Lastly, policymakers can promote the adoption of circular economy principles in procurement strategies.

### 5.4.3 Policy Implication in DC and Competitive Advantage

Within the DC framework, policy implications are multi-dimensional, requiring integration across individual, organisational, national, and international levels. This study examines the evolution of policies from both CE and circular entrepreneurship perspectives. Locally, policymakers should prioritise R-strategies (reduce, reuse, recycle, remanufacture) and align them with green procurement policies and the management of secondary product markets. Internationally, policy development should focus on improving resource efficiency to meet global demand for environmentally friendly products.

In the context of circular entrepreneurship, policies should support the development of an entrepreneurial ecosystem through both short-term measures, such as subsidies and tax exemptions, and long-term strategies that include training, development, and R&D. Policymakers must promote the transition from a linear to a circular model by integrating stakeholders and fostering CE and sustainability practices.

Eco-economic policies that balance economic efficiency, sustainability, and environmental wellbeing are crucial for supporting circular entrepreneurs. The main goal of CE policies should be to encourage sustainable use of natural resources and ensure environmental costs are internalised by organisations. Additionally, governments should assist SMEs in adopting CE principles and encourage larger organisations to comply with environmental standards, such as ISO 14000 or ISO 14001, specifically ISO 59010 (Circular economy standard).

Local-level policies involving environmental governance, alongside regional initiatives that incorporate environmental considerations into industrial development, are vital. Governments should prioritise sustainable energy use in industrial policies and support organisational capabilities to circular entrepreneurs through R&D, technology transfer, and innovation

investments. Organisational transformation can be achieved by adopting new technologies and IT-based governance systems, enabling companies to seize emerging opportunities.

Collaboration between organisations and public administrations can co-create value and enhance DCs, helping organisations tackle environmental challenges. Strengthening DCs in the public sector is essential for addressing both internal and external challenges and delivering public value. Policymakers should increase funding for IT and enhance managerial skills to build long-term capacities within the public sector

## 5.5 Contextual Limitations of Circular Entrepreneurship

### 5.5.1 Challenges of Developing Circular Entrepreneurship Model

Firstly, SLR employed search terms for identifying articles that lack a universally accepted standard. The search queries were developed based on the available literature and data, which may present certain limitations. Another limitation is that only articles directly related to the CE and entrepreneurship were included, potentially narrowing the scope of the research. However, relevant articles were later incorporated to complement the literature and theoretical model. Additionally, we did not include scientific literature, which may have constrained the breadth of our analysis. Furthermore, no quantitative analysis was conducted beyond the examination of journal characteristics. Quantitative analysis could offer further insights and may be considered in future research. Finally, the search was restricted to peer-reviewed articles, excluding PhD theses, conference papers, books, and other materials, which might have provided additional information but were omitted from this study.

### 5.5.2 Limitations of Understanding Paradoxes

Although second paper offers valuable insights for entrepreneurs, managers, and policymakers regarding the transition to the CE and its associated paradoxes, however, certain limitations should be noted. The study is restricted to a qualitative approach, and a larger sample size could provide deeper insights into the adoption of CE in the context of Bangladesh. The authors have sought to mitigate this limitation by employing a multi-method qualitative approach, rather than relying solely on interviews. In addition to conducting interviews, the authors undertook field observations by visiting factories, travelling from the UK to Bangladesh, and observing the practical implementation of CE across different regions. They also verified findings through triangulation to cross-check the accuracy of the data. Another limitation is that the concept of CE is somehow new to respondent and they mix up this concept to sustainability. This limitation minimized by explaining the concept before the interviews.

### 5.5.3 Impediments of Collecting Data to Understand Transformation

The third paper shares similar limitations with the second, as both are based on empirical studies. A limited number of interviewees agreed to participate, posing a challenge in data collection. Entrepreneurs, being extremely busy, were often reluctant to allocate time for face-to-face interviews. This is a common limitation of qualitative research, and the researcher encountered the same difficulty.

## 5.6 Future Research Endeavour on Circular Entrepreneurship

### 5.6.1 Future Model for Circular Entrepreneurship

In case of SLR, future research may explore circular entrepreneurship from the perspectives of various stakeholders or through the lens of the resource-based view or other views. Given that the concept is still emerging, there are numerous opportunities for further investigation in this area. In this review, researcher did not address innovation and related topics, such as business model innovation, dynamic capabilities, technology and waste management, resource efficiency, internal capabilities, the biological cycle, or competitive advantage (Suchek et al., 2021), as the focus was specifically on circular entrepreneurship and its associated issues. However, future studies could concentrate on these areas to guide research in more specialised directions. Additionally, certain aspects of the entrepreneurship framework have been overlooked in current research, such as new venture creation and the social acceptance of circular entrepreneurship, which may be of interest to future scholars. Although previous research has emphasised entrepreneurial passion (Cardon et al., 2009) in adopting new phenomena, such as unconventional risk-taking and non-traditional business practices, the present study is more concerned with the circular entrepreneurship model. Future research could therefore align with these entrepreneurial issues. Furthermore, scholars might examine sustainable entrepreneurship (Hoogendoorn et al., 2019) in relation to circular entrepreneurship, which could make a significant contribution to the existing body of entrepreneurial literature.

### 5.6.2 Understanding Future Paradoxes on Circular Entrepreneurship

For paradoxical theory context, future researchers may explore the issue through alternative theoretical lens and frameworks. Based on our literature review and current understanding, scholars can make a significant contribution to circular entrepreneurship research, particularly as it remains an underexplored area in the context of Bangladesh. While this study focuses on resource, market, investment, and stakeholder paradoxes, future research could identify additional paradoxes not addressed in the present work. Future research can also look cross-country context to get global perspective of circular economy research.

Another potential research avenue lies in examining various contextual variables, such as demographic, economic, and political factors, to investigate their mediating and moderating effects on CE adoption at the firm level. This focus on mediating and moderating influences would introduce a fresh research agenda, as the field remains underexplored. Such an approach could offer a more comprehensive understanding of CE adoption. Although second paper addresses the most critical paradoxes, future researchers could prioritise strategies and tools for mitigating these paradoxes, thereby providing valuable policy implications for the transition towards a circular economy.

### 5.6.3 Gaining Future Capabilities and Competitive Advantages

From a dynamic capability perspective, future research should expand its focus to include both technical and biological cycles, thus addressing broader dimensions of sustainability and circularity to improve the generalisability of the findings. A quantitative approach could be employed in future studies to gain a more comprehensive understanding and general perception of circular entrepreneurship. Furthermore, forthcoming research could explore a wider range

of variables relevant to entrepreneurship and examine mediating and moderating relationships, offering deeper insights into the field.

Additionally, future studies could adopt a more specialised, industry-specific approach, moving away from a general industrial perspective to achieve a more nuanced understanding of the issues of DC and competitive advantages.

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## APENDIX- A

### Qualitative Questions for Entrepreneurs

#### Circular Entrepreneurship (CEPs): Dynamic Capabilities and Tensions

1. Can you please tell about your organization?
2. What are the internal drivers of Circular Entrepreneurship (CEPs) for your firm, for example; motivation, values of top management, cost savings, organizational culture etc.?
3. How you can recognize internal factors/drivers, and how you can achieve those?
4. What are the external drivers of Circular Entrepreneurship to your firms for example; competition, reputation, market expectation, governmental policies, etc.?
5. How do you respond to external drivers, and what are the steps/activities your organization take to adapt those factors?

6. What are the influences of government, customers, industry associations competitors (External stakeholders) and Shareholders, top management, employees ( Internal Stakeholders) affect in transition or in adoption to CE and CEps.
7. What internal activities are important in the transition to CE?
8. How knowledge, leadership strategy, finance, and marketing are helping in this transition to recycling/zero waste/Circular Economy (CE)? (Internal Enablers).
9. Do you have available infrastructure, technology, and favorable economic, social and cultural environment to adopt CE? (External Enablers).
10. What are the internal obstacles do you face in CEps? For example; lack of resources, training, lack of knowledge, resistance to change, lack of consensus on environmental legislation etc.( Internal barriers).
11. What are the external obstacles do you face in CEps? For example; lack of recycling facilities/infrastructure, lack of awareness on CE among the public, governmental policy, availability of external finance, suppliers capability, regulatory constrains etc. (External barriers). (Jesus & Mendonça, 2018)
12. In what capacity CE can ensure economic, social and environmental sustainability? Can you please explain?
13. Any paradoxes or tensions you face?

#### Qualitative Research Questions 2<sup>nd</sup> Part for Entrepreneurs:

##### Question-Related to **Sensing**:

1. For adopting a Circular Economy, please tell me about your surrounding environment (i.e., sources of raw materials, government and private facilities, suppliers etc.), and how do you identify business opportunities related to transitioning to a circular economy?
2. What are the obstacles/challenges that you are facing in adopting circular economy-related initiatives? Do you have any circular economy-related innovation in your organization?
3. What is the culture in your organization in idea generation/motivation for innovation for transitioning to a circular economy?

##### Question-Related to **Seizing**

1. Would you like to redesign/change the way you do the business considering CE opportunities and environmental effects, especially in improving resource efficiency and reducing waste generation?

2. What types of competition do you face now? What are the competitors' reaction to your circular economy-related initiatives (if any)?
3. IF you develop new product or technology for CE, then how do you protect/defend intellectual property (IP)? ( IP is the part of Seizing question)

#### Question-Related to **Transformation**

1. How do you restructure your organizational design to facilitate the transition to a circular economy?
2. What are the surrounding facilities do you feel are important for CE?
3. How do you adjust/align Existing Capabilities/resources for CE? What are the CE related strategies do you have to adopt CE?

#### Qualitative Questions For Managers

##### Circular Entrepreneurship (CEPs): Dynamic Capabilities and Tensions

14. Can you please tell about your organization?
15. What are the internal drivers of CE for your firm, for example; motivation, values of top management, cost savings, organizational culture etc.?
16. How you can recognize internal factors/drivers, and how you can achieve those?
17. What are the external drivers of CE to your firms for example; competition, reputation, market expectation, governmental policies, etc.?
18. How do you respond to external drivers, and what are the steps/activities your organization take to adapt those factors?
19. What are the influences of government, customers, industry associations competitors (External stakeholders) and Shareholders, top management, employees ( Internal Stakeholders) affect in transition or in adoption to CE ?
20. What internal activities are important in the transition to CE?
21. How knowledge, leadership strategy, finance, and marketing are helping in this transition to recycling/zero waste/Circular Economy (CE)? (Internal Enablers).
22. Do you have available infrastructure, technology, and favorable economic, social and cultural environment to adopt CE? (External Enablers).

23. What are the internal obstacles do you face in CE? For example; lack of resources, training, lack of knowledge, resistance to change, lack of consensus on environmental legislation etc.( Internal barriers).
24. What are the external obstacles do you face in CE? For example; lack of recycling facilities/infrastructure, lack of awareness on CE among the public, governmental policy, availability of external finance, suppliers capability, regulatory constrains etc. (External barriers). (Jesus & Mendonça, 2018)
25. In what capacity CE can ensure economic, social and environmental sustainability? Can you please explain?
26. Do you face any tensions?

Qualitative Research Questions 2<sup>nd</sup> Part for Managers:

Question-Related to **Sensing**:

4. For adopting a Circular Economy, please tell me about your surrounding environment (i.e., sources of raw materials, government and private facilities, suppliers etc.), and how do you identify business opportunities related to transitioning to a circular economy?
5. What are the obstacles/challenges that you are facing in adopting circular economy-related initiatives? Do you have any circular economy-related innovation in your organization?
6. What is the culture in your organization in idea generation/motivation for innovation for transitioning to a circular economy?

Question-Related to **Seizing**

4. Would you like to redesign/change the way you do the business considering CE opportunities and environmental effects, especially in improving resource efficiency and reducing waste generation?
5. What types of competition do you face now? What are the competitors' reaction to your circular economy-related initiatives (if any)?
6. IF you develop new product or technology for CE, then how do you protect/defend intellectual property (IP)? ( IP is the part of Seizing question)

Question-Related to **Transformation**

4. How do you restructure your organizational design to facilitate the transition to a circular economy?
5. What are the surrounding facilities do you feel are important for CE?
6. How do you adjust/align Existing Capabilities/resources for CE? What are the CE related strategies do you have to adopt CE?

## List of Tables

Table 1 (SLR): Initial Search Results and Number of Papers Appeared (Scopus and Web of Science, Duplicates removed).

Sl. No.	Key Words	Search Results (No. of Articles)	Limit to	Limit to
1	“Circular Economy” and “Entrepreneurship”	64	Article Title, Key words and Abstracts	All categories
2	“Circular Economy” and “Entrepreneurship”	26	Article Title, Key words and Abstracts	Business, Management, Accounting, Economics and Social Science
3	Circular Economy and Entrepreneurship	71	Article Title, Key words and Abstracts	All categories
4	Circular Economy and Entrepreneurship	30 (Four articles are different and the rest are common.) Total=30.	Do	Business, Management, Accounting, Economics and Social Science
5	“Circular Economy” and “Start-up”	32	Do	All categories
6	“Circular economy” and “Start-up”	14	Do	Business, Management, Accounting, Economics and Social Science
7	Circular economy and start-up	32	(All 32 are the same)	All categories
8	Circular economy and startup	22	Do	All categories
9	Circular economy and startup	13	Do	Business, Management, Accounting, Economics and Social Science
10	“Circular economy” and “Self employed”	0 ( No documents found)	Do	All Categories
11	Circular economy and Self employed	10	Do	All Categories
12	Circular economy and Self employed	2	Do	Business, Management, Accounting, Economics and Social Science
13	“Circular economy” and “Self employment”	0	Do	All Categories
14	<b>Circular economy and Self employment</b>	7	Do	All Categories
15	<b>Circular economy and Self employment</b>	3	Do	Business, Management, Accounting, Economics and Social Science
16	“Circular economy” and “new business”	166	Do	All Categories
17	“Circular economy” and “new business”	66	Do	Business, Management, Accounting, Economics and Social Science
18	Circular economy and new business	670	Do	All Categories
19	Circular economy and new business	300		Business, Management, Accounting, Economics and Social Science
	Initial Grand Total	1,528		

Table 2. : Geographical Location (SLR)

EU	Asia	Not specific	South America	Central America	Latin America	Africa	North America	Total (N)
85	14	34	9	1	1	2	6	152
56%	9%	22%	6%	1%	1%	1%	4%	100%

Table 3. Profile of Case companies, interviewees and Data Sources.

Firms/Case Code	Region	Industry sector and business activities	Number of employees	Number of interviews	Designation	Data Source
1	Chattogram	Garments	28,000	2	Sustainability manager and Head of HR	Interview
2	Dhaka	Garments	861	1	Entrepreneur	Interview and websites
3	Chattogram	Garments	35,000	2	Entrepreneurs And Sustainability Head	Interview, factory visits, and websites
4	Dhaka	Garments	550	1	Entrepreneur	Interview and websites
5	Dhaka	Safety Gloves and equipment	10,000	2	Sustainability and Production Engineer	Interview and websites
6	Chattogram	Garments	40,000	3	Entrepreneur, Sustainability manager, Head of HR and Planning	Interview and websites
7	Dhaka	Garments	10,000	1	Entrepreneur	Interview and websites

8	Dhaka	Garments	1,400	1	Entrepreneur	Interview and websites
9	Chattogram	Building Constructions	5,00	1	Production manager	Interview and websites
10	Dhaka	FMCG	7,180	1	HR Manager	Interview and websites
11	Dhaka	Power Generation	5,00	1	Production Engineer	Interview
12	Dhaka	Garments	21,000	1	Head of HR	Interview and websites
13	Dhaka	Pharma	10,800	1	Head of Quality	Interview
14	Dhaka	Garments	15,245	1	Head of Sustainability	Interview and websites
15	Chattogram	Paper	1,000	1	Managing Director	Interview
16	Chattogram	Garments	750	1	Entrepreneur	Interview
17	Chattogram	Steel Manufacturing	2,286	1	CPO	Interview and websites
18	Chattogram	Garments	7,000	1	Deputy General Manager	Interview and websites
19	Dhaka	Constructions and others	35,053	2	Head of Market Intelligence, Head of HR	Interview and websites
20	Chattogram	Garments	25,000	1	Head of Finance	Interview and websites
21	Dhaka	Garments	18,000	1	Head of HR	Interview
22	Dhaka	FMCG	1,50,000	1	Entrepreneur	Interview and website
23	Dhaka	Waste Management	20	3	Two Entrepreneurs, and one scientist	Interview
24	Chattogram	Steel Manufacturing	2,800	2	Head of Marketing, Head of production	Interview
25	Chattogram	Chemicals	10	1	Entrepreneur	Interview
26	Chattogram	Agriculture	12,500	1	Entrepreneur	Interview and website

27	Dhaka	Plastic Products	250	1	Entrepreneur	Interview
28	Dhaka	Paper Mills	200	1	Production Manager	Interview
29	Dhaka	Bio-plastics	75,000	1	Scientist	Interview
30	Dhaka	FMCG	10,000	1	Head of HR	Interview and websites
31	Dhaka	Pharmaceuticals	3,000	1	Head of Quality Assurance	Interview
32	Chattogram	Ship making and repairing	1,000	1	Head of Commerce and purchase	Interview

Table 4. Coding for Developing Themes (Paradox)

Table 2. Structure of Coding and Content of Market Opportunities and Paradoxes and exemplary quotes

Company Code	Paradoxes and content	Coding issues and focus					Exemplary Quotes
		R	W	I	T	M	
1	<b>Market Standard</b>	x			x	x	1. "Another external challenge is mindset of buyers, every time please give recycle fabric, please ensure your energy efficiency, please don't incinerate your waste, please ensure waste circular recyclability or reuse, please waste water treat properly, ensure waste water treatment, but everything need cost, but they don't increase our product price." 2. "Our textile factory established membrane-based reactor technology"
2	<b>Technology</b>		x		x	x	" Now, we are getting more sophisticated machines are getting more sophisticated and the speed is increasing, and the flexibility of the machine is increasing. But, for that, you need a certain kind of strength of yarn. Recycled yarn is not fit with sophisticated machines."
3	<b>Stakeholder</b>	x		x	x	x	1. If we can establish more solar power plant, we will overcome the energy shortage. But unfortunately, you can see the government imposed 26-30% duty on the solar equipment, which is really doesn't make any sense." 2. "Our facility is also certified on GRS(Global recycling standard), and

							Recycled Claimed Standard. We are working with H&M, M&S, TESCO, and we are producing for all of them based on 3 standard”
4	<b>Stakeholder</b>	x				x	“When we talk about govt. policy, then it is a different story, because government need to a make a formal CE policy”
5	<b>Technology</b>	x				x	“So that innovation, that technology there is huge lacking in the market in Bangladesh.”
6	<b>Stakeholder</b>	x	x	x	x	x	1.“We need the help from the government, from the donor agencies”, 2.“each and every year we have to put data in HIG platform....you have to implement ZLD”, 3. “international brand coming with standard, USA brand Contour coming with same standard” Head of Planning,
7	<b>Technology</b>	x				x	“Technology in third world country like ours, not developed”
8	<b>Stakeholder</b>	x				x	“Multi-national and development partner come forward, the green climate fund.”
9	<b>Stakeholder</b>	x				x	“This has to be initiated by government in all case, so that there is big barrier.”
10	<b>Technology</b>	x		x	x		“I think another problem is the technology. We have, technology is the biggest problem. Most of our companies are not interested to investment in recycling process.”
11	<b>Stakeholder</b>	x				x	“Our government should be stricter in implementing the three-year policy. Bangladesh government has a three-year policy, but these things are not being implemented in every way.”
12	<b>Technology</b>	x				x	“Definitely technology is not easy, and technology know how is also difficult and also skilled manpower are also very very difficult to get. People are not that level trained”.
13	<b>Market Standard</b>	x				x	“ <b>W.H.O</b> is the biggest guidelines that we are following in the Pharma industry...We are following British Pharma Copia and United States Pharma copia”
14	<b>Stakeholder</b>						“As I have mentioned earlier, the government has some policies and as per those policies, banks are yielding or lending money on green technologies”
15	<b>Stakeholder</b>	x				x	“Our market is government organizations like universities, colleges, schools, National Curriculum and Text Board (NCTB). Small percentage of paper they purchase is enough for KPM (Karnaphuli Paper Mills) survival.”
16	<b>Stakeholder</b>	x				x	“That is the opportunity, but things that I think, government should take this step, number one.”

17	<b>Market</b>	x				x	“So the China competition is one of the major challenges that we are going to face for sure, and the world recession that this is the most, the 2 <sup>nd</sup> challenges that we are facing right now.”
18	<b>Market</b>	x				x	“You need this competitiveness because end of the day my customer is looking for the sustainable supply chain. In the same time the most efficient prices because you know, this is a price moving industry, the customer will not buy if the price goes higher. So, always we have to be competitive in the market.”
19	<b>Market</b>	x				x	“I would not say there would be any conflict between the government or corporations like us. We would love to go hand in hand. They will surely converge into the goal, I believe....we are facing some challenges from the government organizations like as I told you the government has to approve these aggregates that we are using in the construction activities”
20	<b>Market</b>	x				x	“Every year we are getting some in puts from our buyers ....that we have to be adaptive in our industry to take the sustainability the first things.”
21	<b>Technology</b>	x				x	“Whenever any garment is produced, there is a requirement of shrink thread. So, there are some common colors like black, white, red, yellow, and a few common colors....multi-color is a problem in processing...”
22	<b>Stakeholders</b>	x	x	x	x	x	“So, the cost is the most important thing and we want government organizations to start working on these types of things....government is the main factor, customers are least bothered”
23	<b>Stakeholders</b>	x		x	x	x	“ <b>Yes</b> , Government is helpful on this waste management sector. But, there is something that there are some people who don’t want this because they hampered their business. You know the waste collection is the biggest business in Bangladesh.”
24	<b>Stakeholders</b>	x				x	“ <b>Challenges are internal</b> , because this is a process. So, we have to train the people. If you don’t get proper people in proper time for production and other things, this is one of the challenges to people management.”
25	<b>Technology</b>		x	x	x	x	“ <b>At this moment</b> , it’s very difficult. In Bangladesh, we have faced a lot of problems like capital, technology. In future I think it will be easy if we get technology.”
26	<b>Technology</b>		x			x	“So, the technology is very costly...Waste management is very costly...In Bangladesh technology is unavailable. And even if you buy technology, there is a power supply issues and there are maintenance issues. There is lot of operational issues...”
27	<b>Resource</b>	x	x			x	“For one party, the plastic may be wastage, but the wastage can be raw materials for another party. So, the companies which are producing water

							bottles and after using the bottle their wastage may be raw materials for the packaging companies.”
28	<b>Stakeholders</b>	x			x	x	“We don’t get any direct motivation from the government. But centrally the government tries to ensure the green economy.”
29	<b>Stakeholders</b>	x				x	“There are many viable alternatives to plastic, such as bio-plastics produced from starches. Starches are readily available and are human food items. However, there is a danger that bio-plastics contain some plastics in the starches.”
30	<b>Stakeholders</b>	x			x	x	“Two sorts of challenges are there. One from the regulatory side or government side. We have to be more and more attentive and careful and the vigilance and governance from the regulatory side..”
31	<b>Technology</b>	x			x	x	“The technology may not be able to add up all the pharma company. Okay, I feel that the top management as well as the finance, not taking such way. So, then we have to take it seriously. But they are doing all these things to manage the authority....They are not intend to go for modern technology...”
32	<b>Stakeholders</b>	x			x	x	“ <b>B</b> ut though in the govt regulations, we have some encouragement, but we don’t find it there are some compulsions and there are some strict body who can compel us to comply those to facilitate the recycling something.”

Note. R=Raw materials, W=Waste Management, I=Investment, T=Technology, M=Market

Table 5. Coding Protocol for DC

Table 2. Structure of Coding and Content of Dynamic Capabilities and exemplary quotes

Company Code	Dynamic capabilities and content	Competitive Advantage	Coding issues and focus			Exemplary Quotes
			Sen	Seiz	Trans	
1	<b>Sensing Through climate crisis</b>	x	x			1.“Yes, we are sensing there is a CE is the future of our world....right now we are facing water crisis in Chittagong...Dhaka is one of the worst air quality city of the world,..Buriganga river, Karnapuli river, a lot of river are polluted by waste water” “(Seizing) related with our higher management”, “(Transforming) No, it is not aligning. We need lot of changes.”
2	<b>Sensing through</b>	x	x	x	x	“We are using ETP. In ETP, we are using zero discharge. Okay? We are using MAMBRANE....”

	market, seizing through technology ,					
3	Sensing through market, Seizing through technology	x	x	x	x	“ 1 “They(customers)are even also committed to reduce 30% of carbon emission.” ...But last 10 to 15 years, we have gone through a journey of transformation in order to reduce water and energy consumption and also introducing recycling successfully.” 30 years back, per jeans water consumption was more than 100 liters but now with the help of modern technology and chemicals, it reduces to 5-10 liters per jeans.”
4	Sensing through market, seizing through technology ,	x	x	x	x	“1. I can see that the demand of recycled product is actually growing. So, what happens, we started searching who is making this product...”, 2. “So, this kind of data-driven activities, there is a data-driven information is very important to sell your products (redesigning)” “For my company is, I am telling you that we have a inbuilt system for many years...so, we are practicing for many years these things.”
5	Sensing through market, seizing through structural change	x	x	x	x	“1.We are sensing that in future, I think in the next 5 or 10 years, you cannot buy anything without carbon tax.”Yes, we are very much aligned and our top management also they have enough actually risk-taking capability to adopt this structural change. They are very much ahead on that.”
6	Sensing through market, seizing through technology ,	x	x	x	x	1.“Well, changes are coming every....(sensing)”, 2.“This is a demand of the time..(seizing)”, 3. “You see the restructuring process is the never-ending process....,So my organization believes it, that is why our growth is ther in 30 years we are in one of the positions and we believe we can sustain...”
7	Sensing through market	x	x			I would say that recycling is not a fashion...it is a time consuming process, right. It is our necessity. “Technology in third world country like ours, not developed”

8	<b>Sensing through climate change, seizing through resource optimization</b>	x	x	x	x	“1. I think that the first sense because in Bangladesh we are witnessing this time of year, it is very high temperature, ...an effect of El Nino, global climate has changed significantly”, 2. So, optimization of resources is very very important...also creating awareness about optimization of resources not only in materials but also usage of electricity, usage of air conditioners”
9	<b>Sensing through government and regulations</b>	x	x			“I don’t see Bangladesh to be honest there is any change at all....government has any vision on it.”
10	<b>Sensing through product quality and efficiency, seizing through automation.</b>	x	x	x	x	“1.We have to focus to recycle our product and we have to also ensure the quality of the product.” “2. Here we are taking initiative, some automation, and some robotic science, we are working with different organization in Bangladesh.”
11	<b>Sensing through efficiency, seizing through technology ,</b>	x	x	x	x	1.“Actually we have developed some KPIs indicators we have distributed the KPIs and as leading indicators, we are measuring how much waste are generated and we are calculating it from quarter to quarter. Always we are trying to continually improve our performances.”, 2.“GE is promoting more towards renewable energy. GE has a wing which is working on renewable energies. Also usage of clean hydrogen for power generation.”, 3.“We are promoting our cleaner technologies such as 9HA or clean hydrogen or using renewable energy to generate power”
12	<b>Sensing through market</b>	x	x			“1. Our company wants social reputation, number one, right to be the market leader, right and cost-effective also” “2. Entrepreneurs are very interested to build their green factory. If they go for the green factory, it could be definitely happen, because it is a

						requirement, pre-requisite without it you cannot be sustainable. You can't be a LEED certified factory.”
13	<b>Sensing through productivity and efficiency, seizing through continuous improvement</b>	x	x	x	x	“ <b>1.</b> If you think every process we are, we have to maintain zero waste, then that will help us our productivity, that will help us our minimize the costs..”, “ <b>2.</b> The continuous improvement process, considering 0 waste, and also considering the recirculation...”
14	<b>Sensing through market demand, seizing through technology</b>	x	x	x	x	“ <b>1.</b> So, what is the demand coming from outside, inside to my neighbors from my inside the country, outside the country. I need to keep this with all those things. And these helps us in sensing why I should go for circular economy. ”, “ <b>2.</b> Now we are capable of using those consumed goods. So, it is this mindset, these latest technologies and trainings, it helps us to cope up with those changes.”
15	<b>Sensing through product efficiency.</b>	x	x			“One is the use of recycled fiber and the percentage of recycling of fiber. This reduced the cost of the paper.”
16	<b>Sensing through market</b>	x	x			“The standard right now exist in China and but I don't know why buyer is pushing Bangladesh on this.”
17	<b>Sensing through market, seizing through technology</b>	x	x	x	x	“ <b>1.</b> If you look at the market...if you want to get benefit out of your products that you need to be very competitive into the market...”The main materials of steel is scrap, and most of the components are sourcing this from the similar source....sustainability is the only way where you can focus on.”, “ <b>2.</b> I am currently working on and leading the transformation journey of GPH in terms of organizational changes and design.”
18	<b>Sensing through market, seizing</b>	x	x	x	x	“ <b>1.</b> I said that compliance, social compliance, environment, all this right, now becoming prerequisite. So, there is no way that we can move forward with those these things.”, “ <b>2.</b> I mean intelligent, intellectual people working in the industry. I mean to grab new

	<b>through awareness</b>					things to have a open mind....Bangladesh has process a lot of transformation”
19	<b>Sensing through market, seizing through technology</b>	x	x	x	x	“1. “Yes, we’ve started our journey toward reducing the tissue paper, for instance.”, “our job is to understand the macro economy first..” “2. Yeah, in terms of energy consumption, we are installing solar panels...”
20	<b>Sensing through climate change, Seizing through technology adoption</b>	x	x	x	x	“1.Sensing actually we are getting the awareness for environment preservations. Every year we see in the global climate summit all countries prime minister and government head are telling about carbon emission and global warming.”, “2. “We are also not exceptional adapt to the circular economy or sustainability theme in our production, man power designing and also the customer satisfaction...we are already adapted some machineries, production process...”
21	<b>Sensing through climate change, seizing through R-strategies and technologies</b>	x	x			“1. You know in the whole world, there is a crisis like global warming, carbon emissions. There is a seasonal change. At the same time, the cost of the product is there. ....so this actually comes out our attention”2. “Now we are keeping it, sorting it, recycling it and reusing it. ....there are other technologies people use like solar power and rain water....”
22	<b>Sensing through local market,</b>	x	x			“I told you earlier, the first thing is our ‘Tokai (street children). Bring some of those, they will give you some good ideas...Go to Dhalai river. The way they separate these two parts, the aluminum part and plastic part to reproduce different items”
23	<b>Sensing through environment, seizing through technology</b>	x	x	x	x	“1. Waste hampers daily life of people, so first, our main motive was that to bring a better life to the people because a lot of hazardous chemical metal there...to make waste problem into wealth....”, “2. So, we have invented this type technology that can make these things to usable products.....so our plant basically, totally eco-friendly..”

24	Sensing through environment, seizing through technology	x	x	x	x	“1. In Bangladesh, there is pollution everywhere, like water where we are discharging plastic and other wastages.....so you see people are polluting the environment by throwing the contaminated chemicals..”, “2. We already took the technology, because we are capturing almost all the waste management.”
25	Sensing through environment,	x	x			“Actually, sense means the change of environment and the change of business also. This is related to sustainability. Environment is already changing but we try to make an opportunity for another business or by product business also”
26	Sensing through environment, seizing through technology	x	x			“1. You have to protect your surrounding environment...”, “In practice, it is not yet ready, because you have to work on it to understand the people...”, “2. We use products of which almost 70% are recyclable...we recycle the raw materials.”
27	Sensing through market	x	x	x	x	“There is no chance to avoid plastic. For one party, the plastic may be wastage but the wastage can be raw materials for another party”
28	Sensing through market, seizing through technology	x	x			“1. Because of the economic condition of Bangladesh and the reduction of export and import, there is a lack of raw materials of paper. Many mills are closed due to the extra charge of raw materials.”, “2. Earlier we used to need a lot of labor, but now we get help from <b>technology</b> .”
29	Sensing through environment, seizing through product design	x	x	x	x	“1. Plastic is not only harmful to the environment but also harmful to people.”, “2. There are some organic or bio-plastic products, like Sonali Bag, which are plastic free.”
30	Sensing through environment, seizing	x	x	x	x	“1. So, by seeing that we try to get into the latest technology, so that our wastage are less, and environment pollution are less..”, “2. R&D seizing this opportunity.”, “ how can we work, there has ample of opportunities...”

	<b>through R&amp;D</b>					
31	<b>Sensing through surrounding environment, seizing through standard.</b>	x	x	x	x	<p><b>“1. If you see,</b> just in 2 years or 5 to 10 years back, the tissue paper. What we are used....the beauty of circular economy that is come from the paper waste..”, <b>“2.</b> There is the regulatory area as in the pharmaceutical company, local and global standards all the time ...they are very strict in this regard.”</p>
32	<b>Sensing through surroundings</b>	x	x			<p><b>“I strongly believe</b> that circular economy has a huge prospect in our country.”, <b>“But we don’t think</b> that there is some pragmatic steps taken by the higher authorities. It is a buzzword.”</p>

**Note. Sen=Sensing, Seiz=Seizing, Trans=Transforming**

List of Figures

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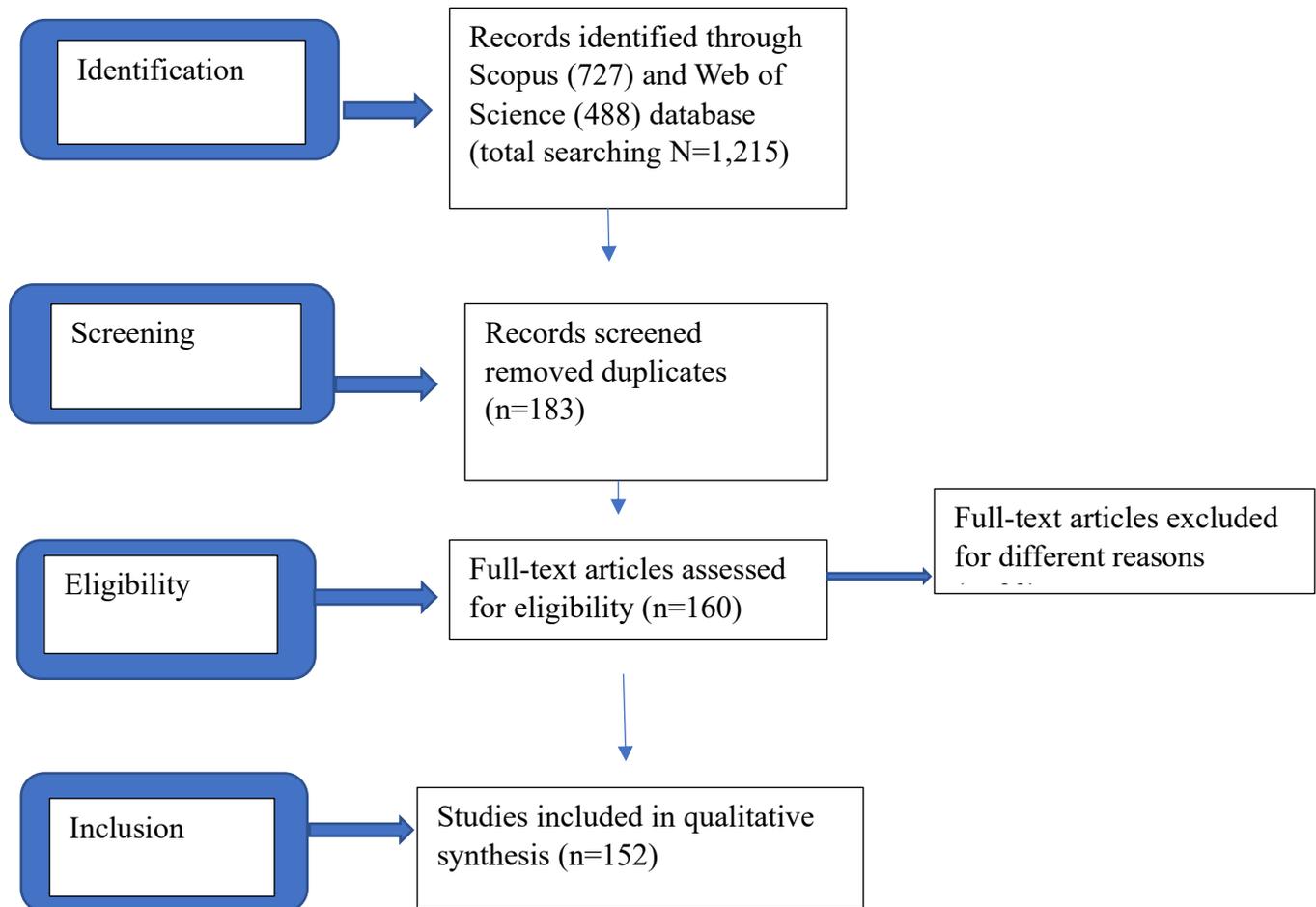


Figure 1.: Flow Chart Method Used in this Study, “ Prisma Method”

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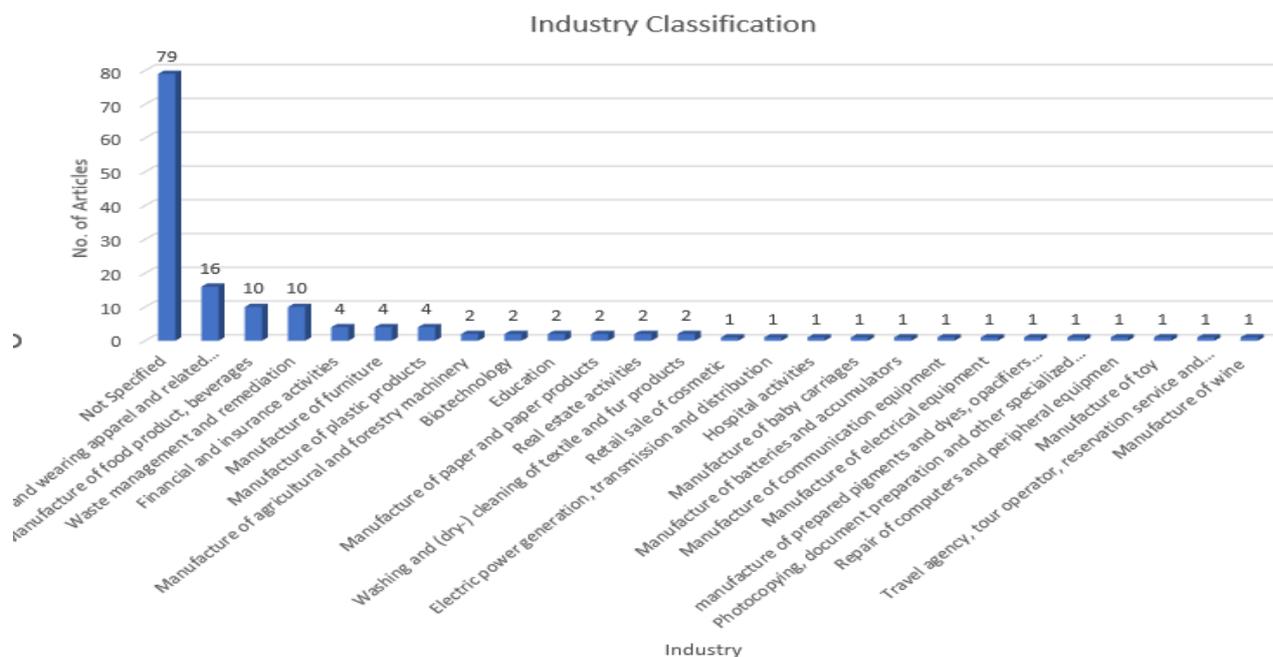


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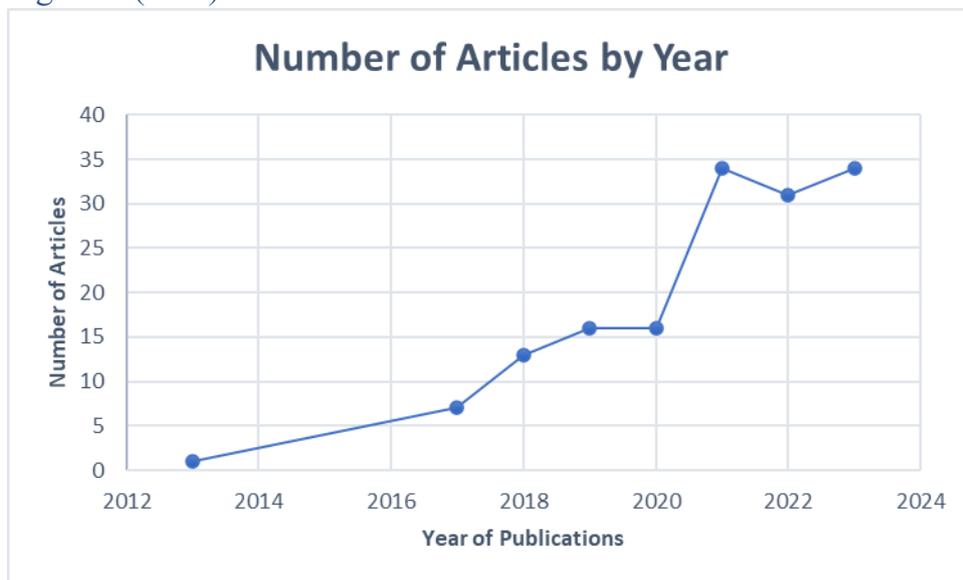


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## Circular Entrepreneurship Model

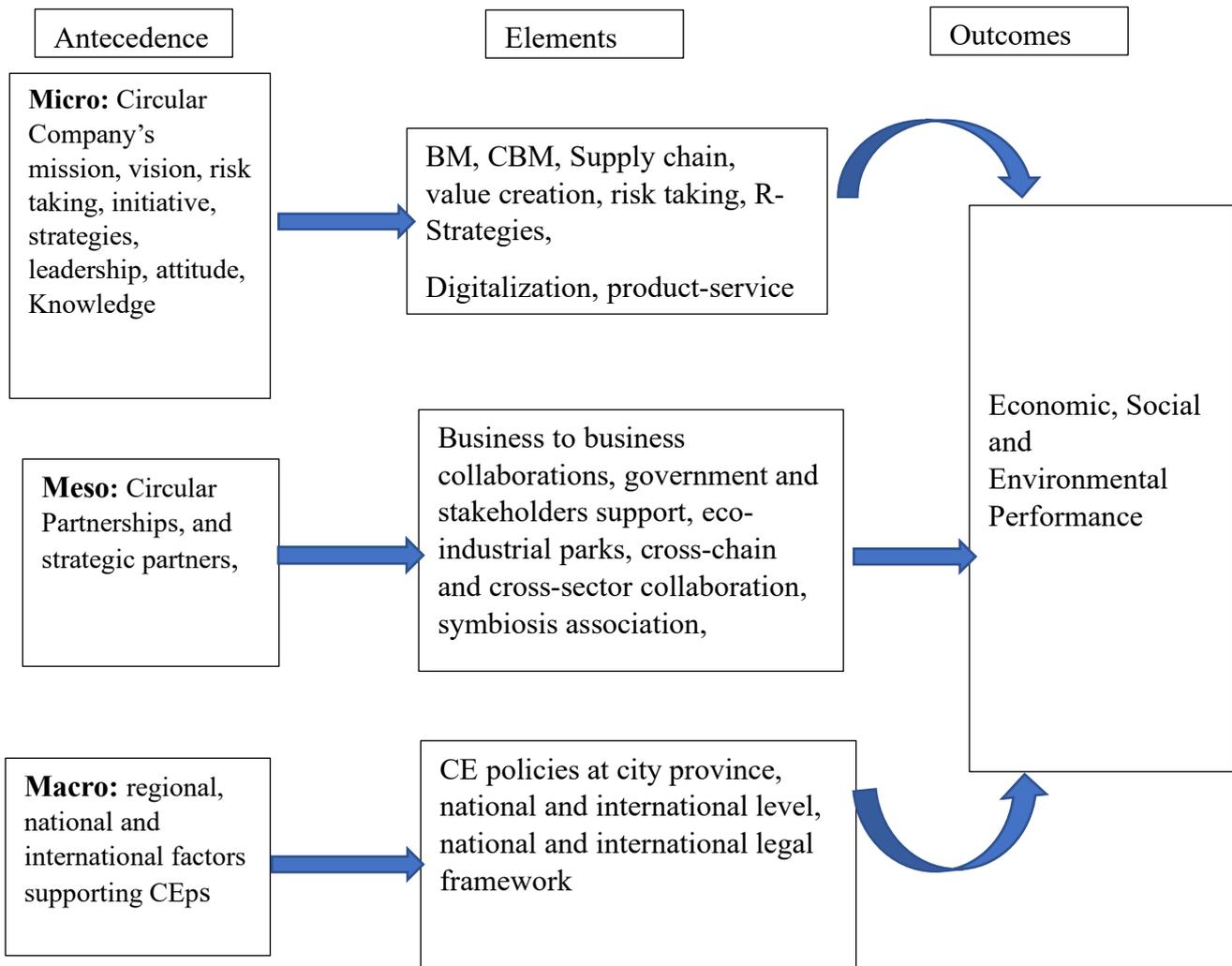
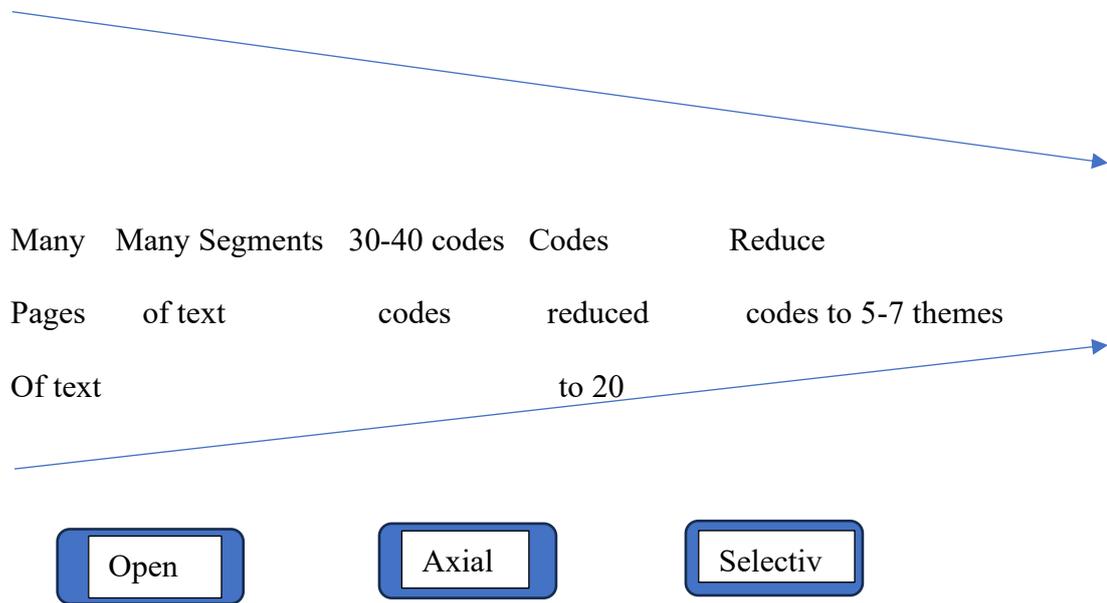


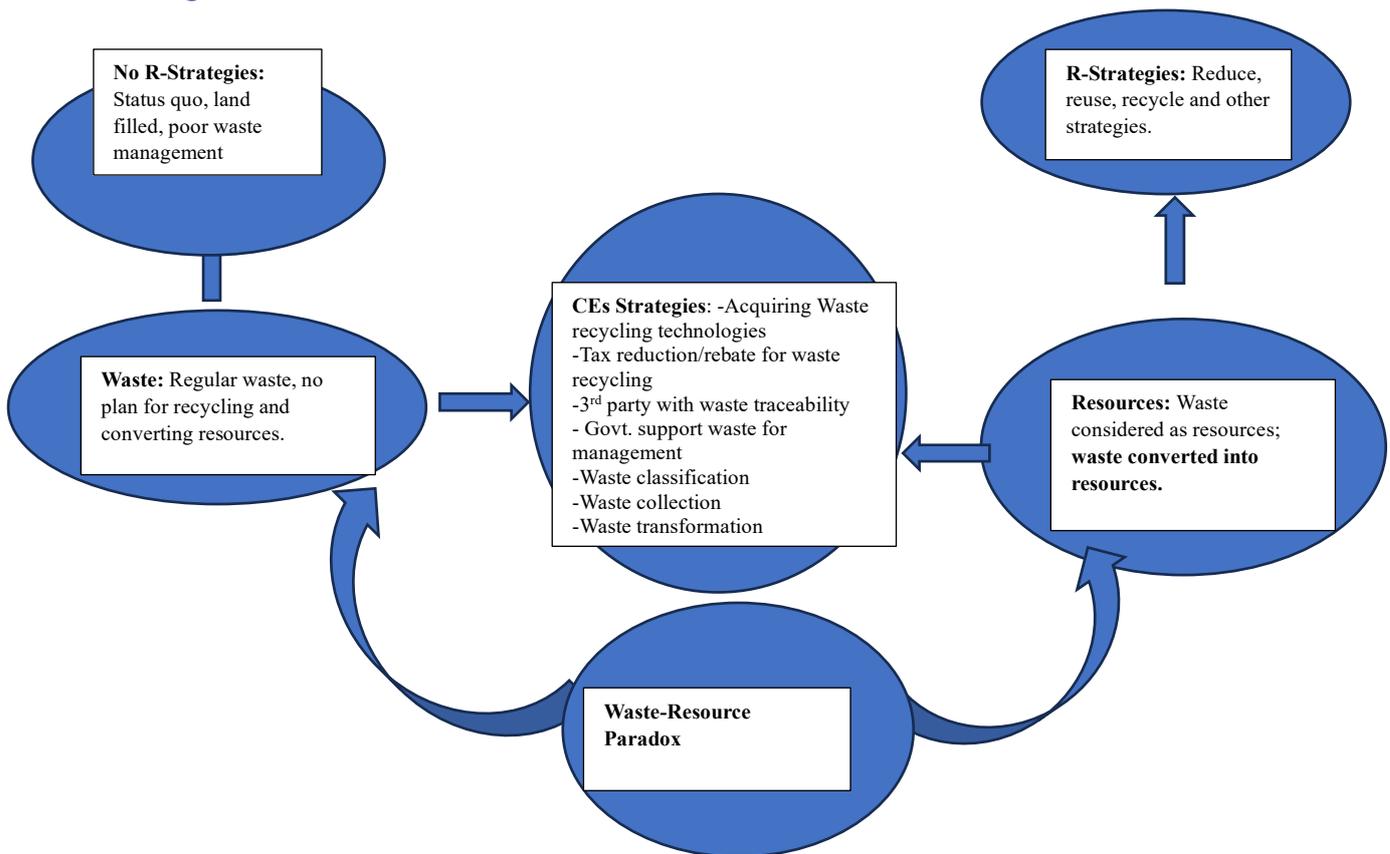
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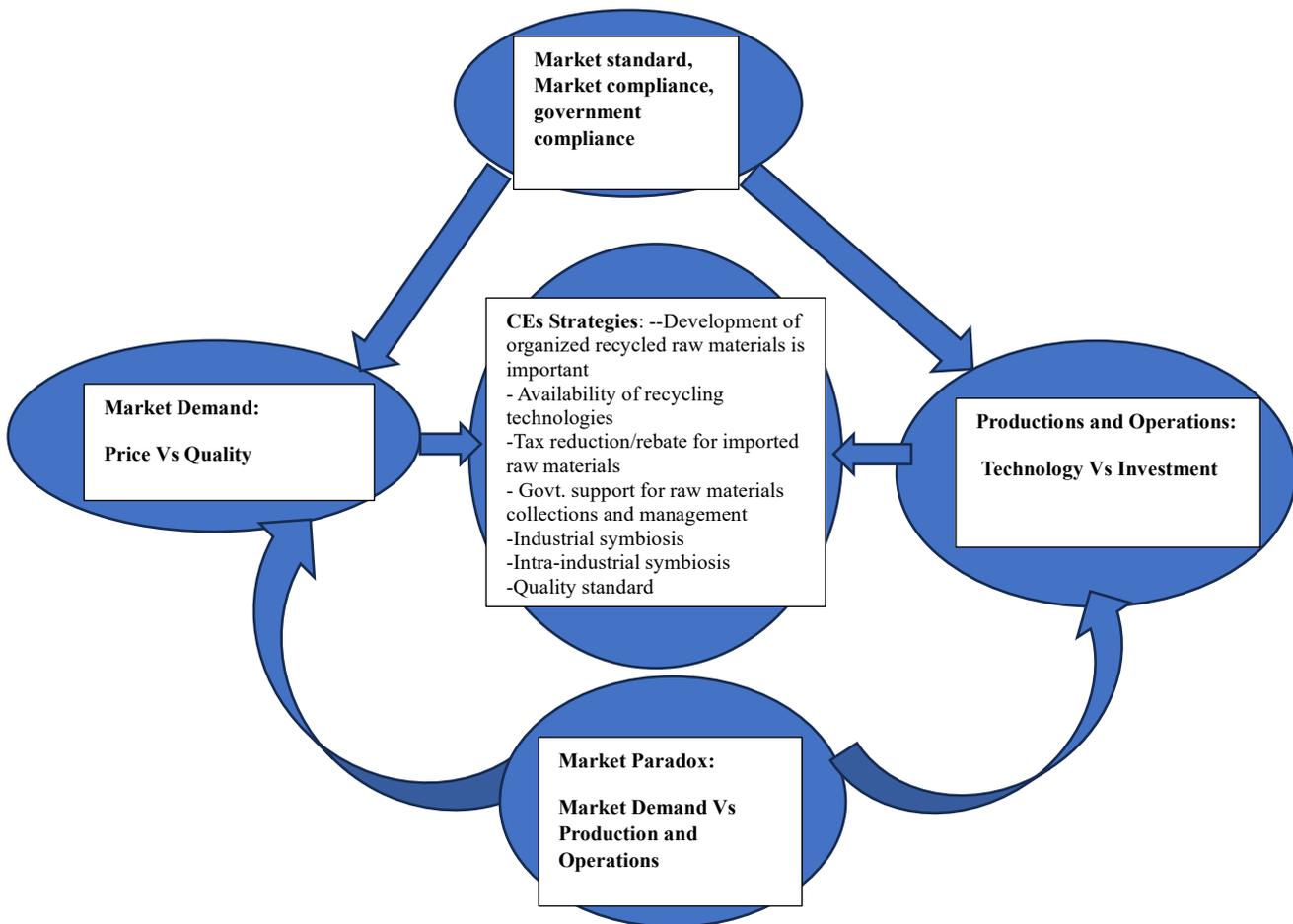
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Figure 6. Waste- Resource Paradox



**Figure 6. Waste-Resource Paradox.**

Figure 7. Market Paradox



**Figure 7. Market Paradox.**

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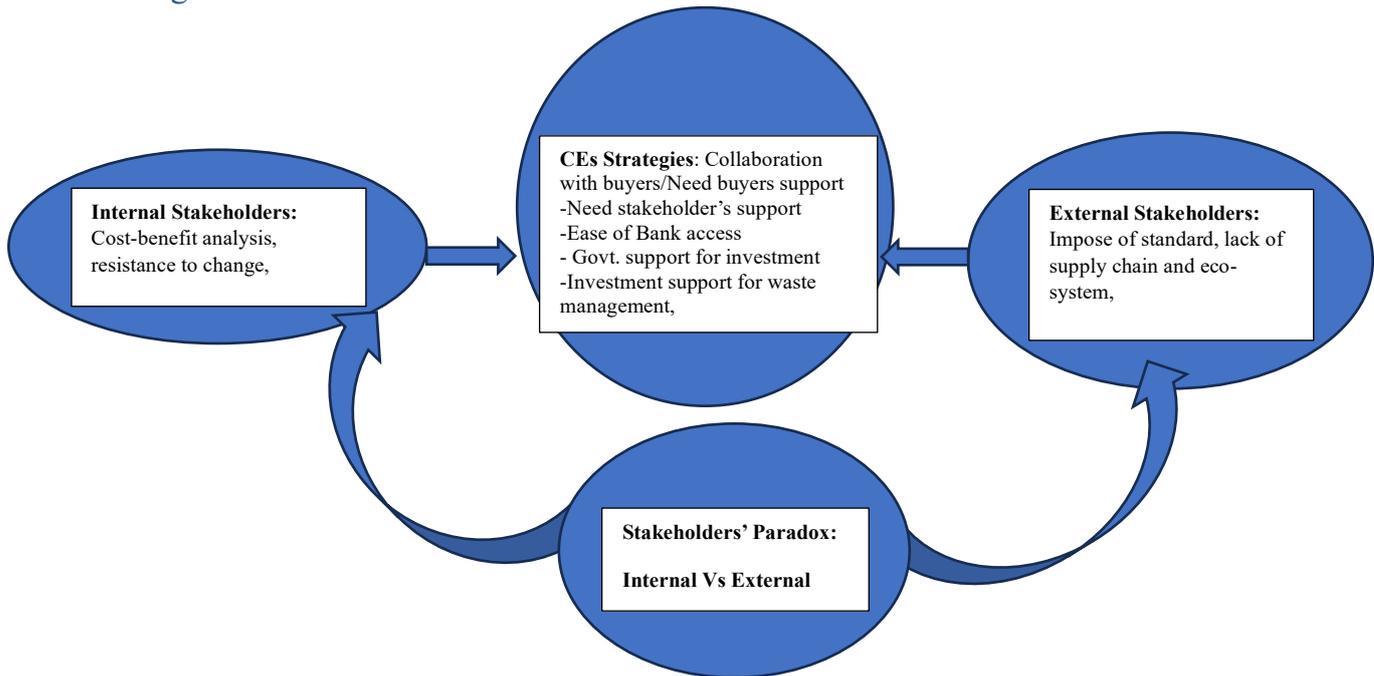


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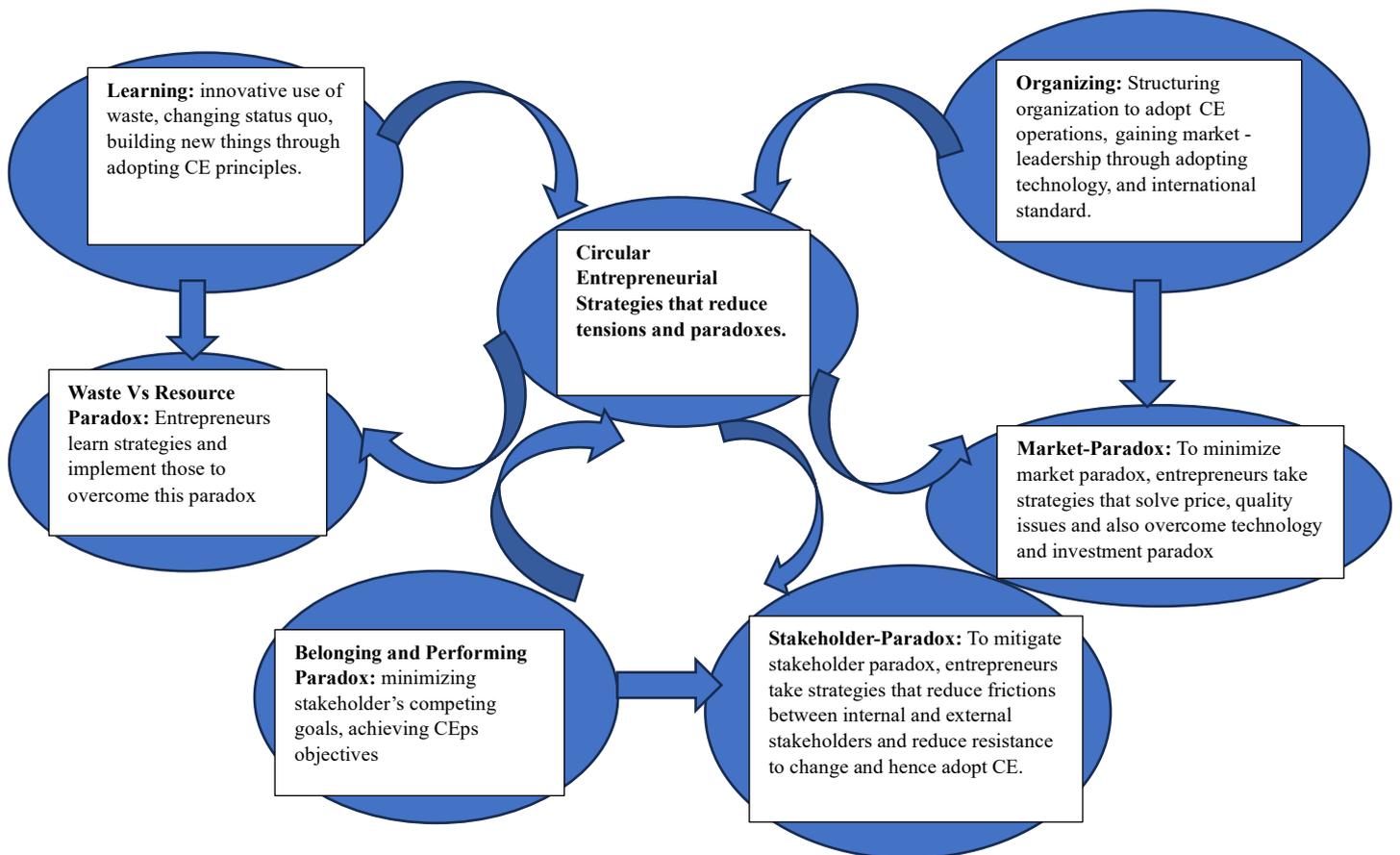


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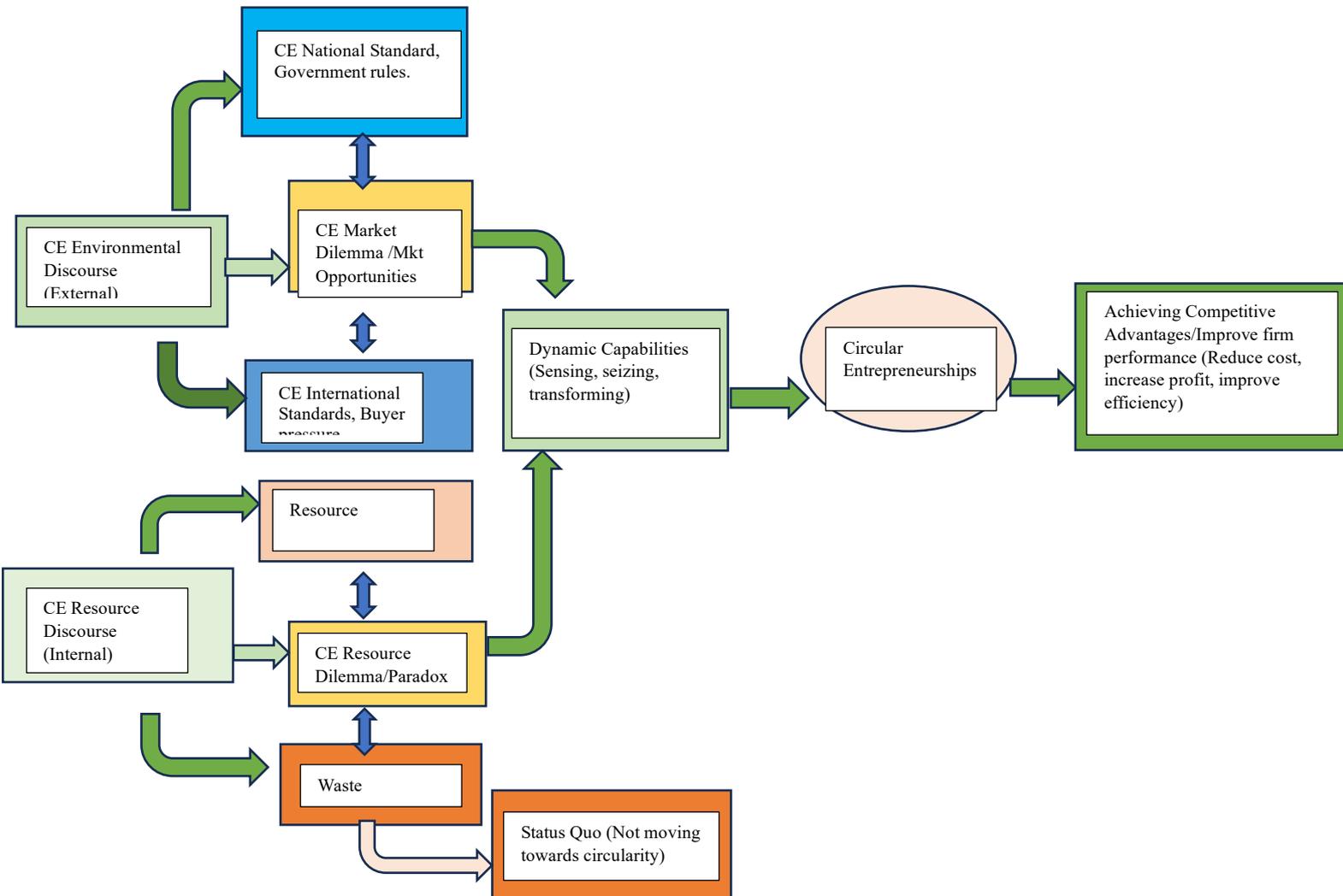


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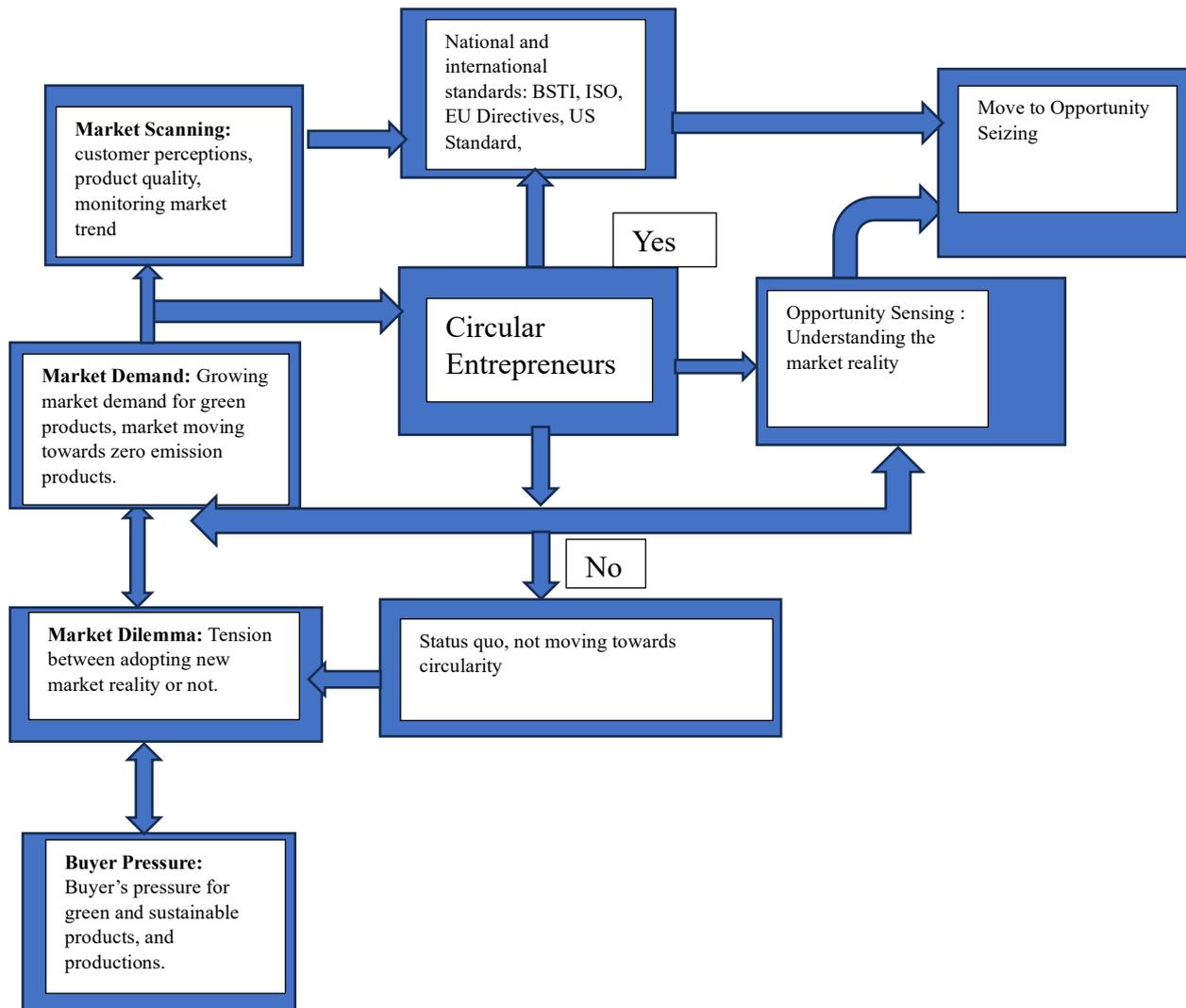


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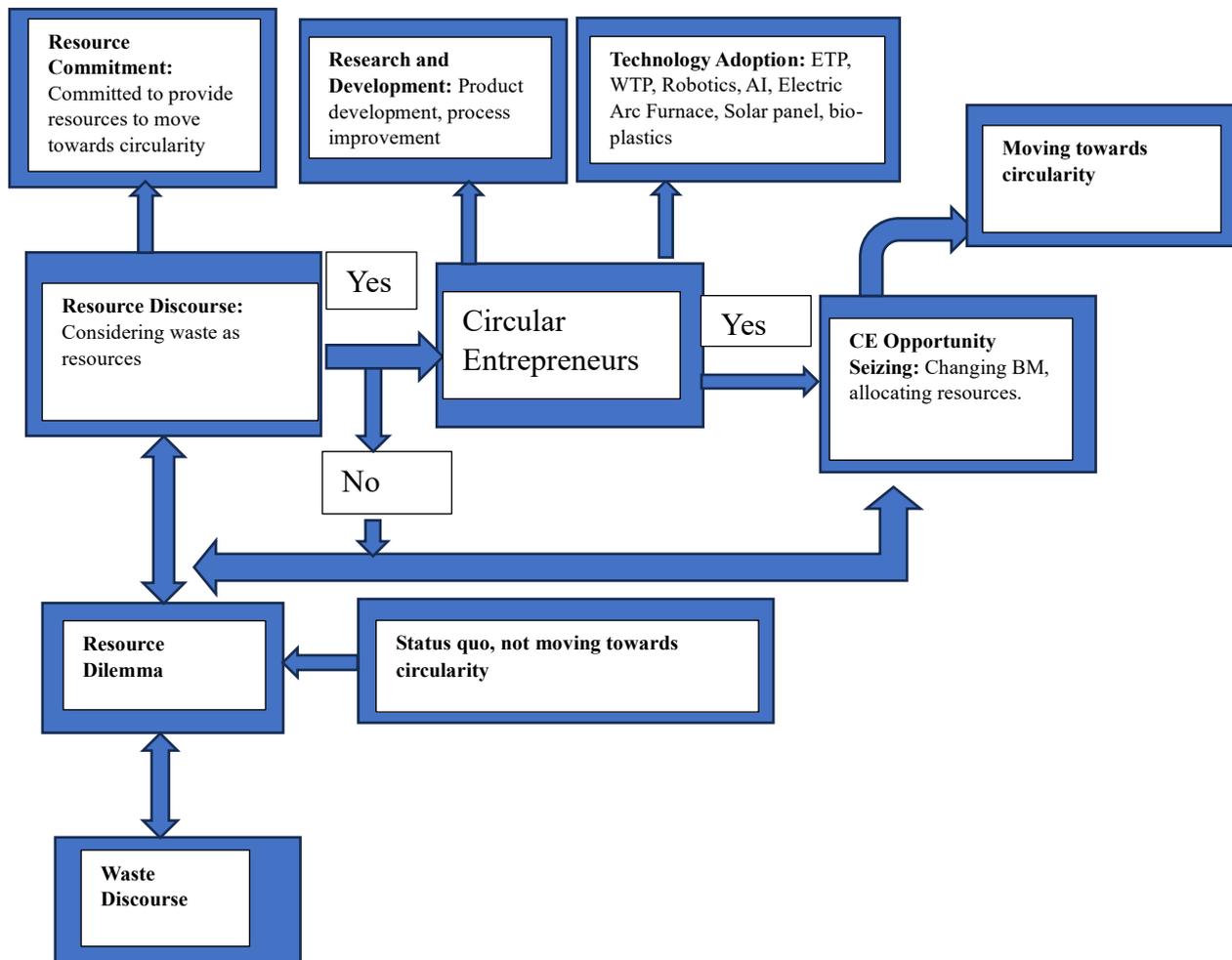


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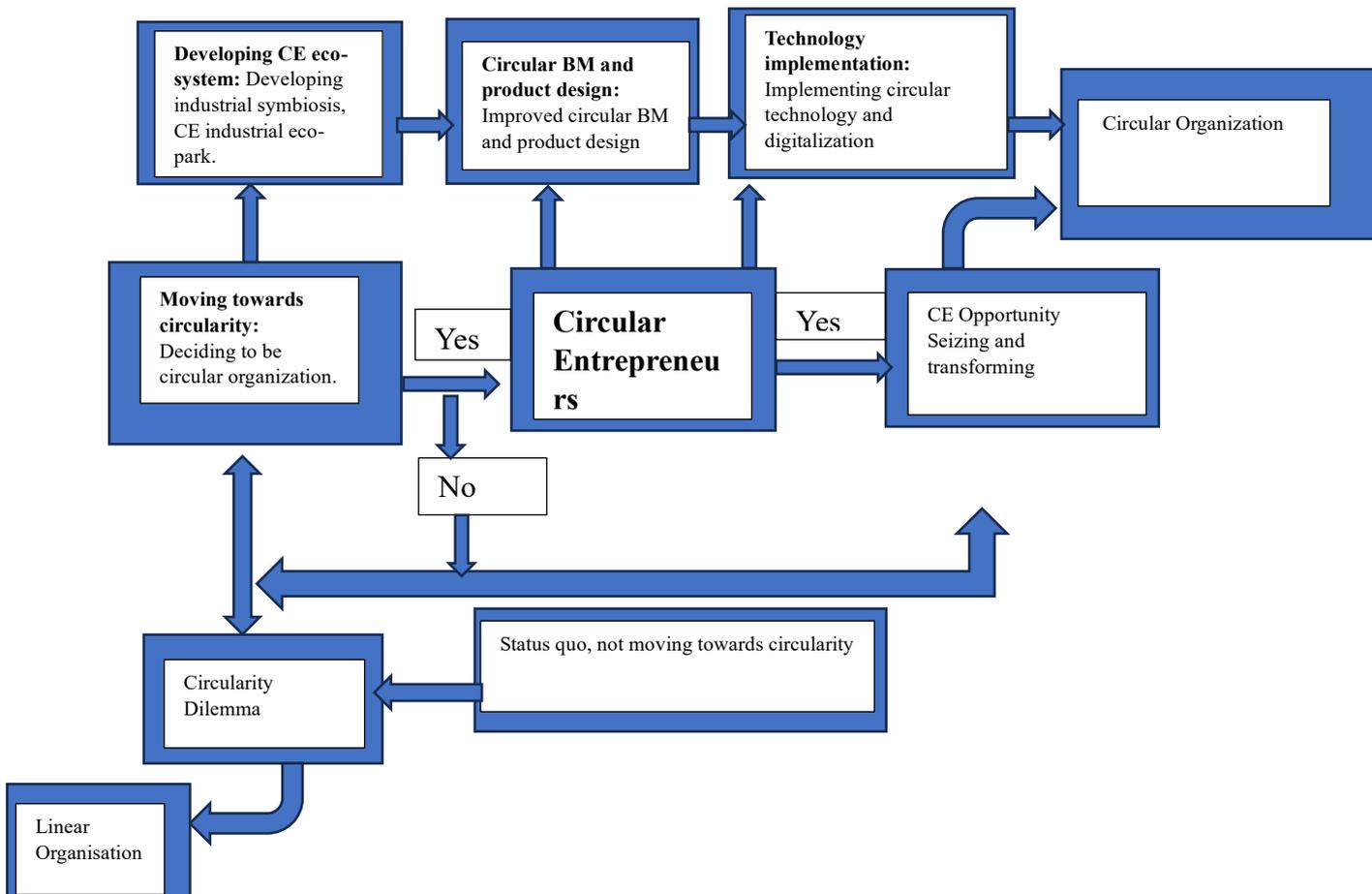
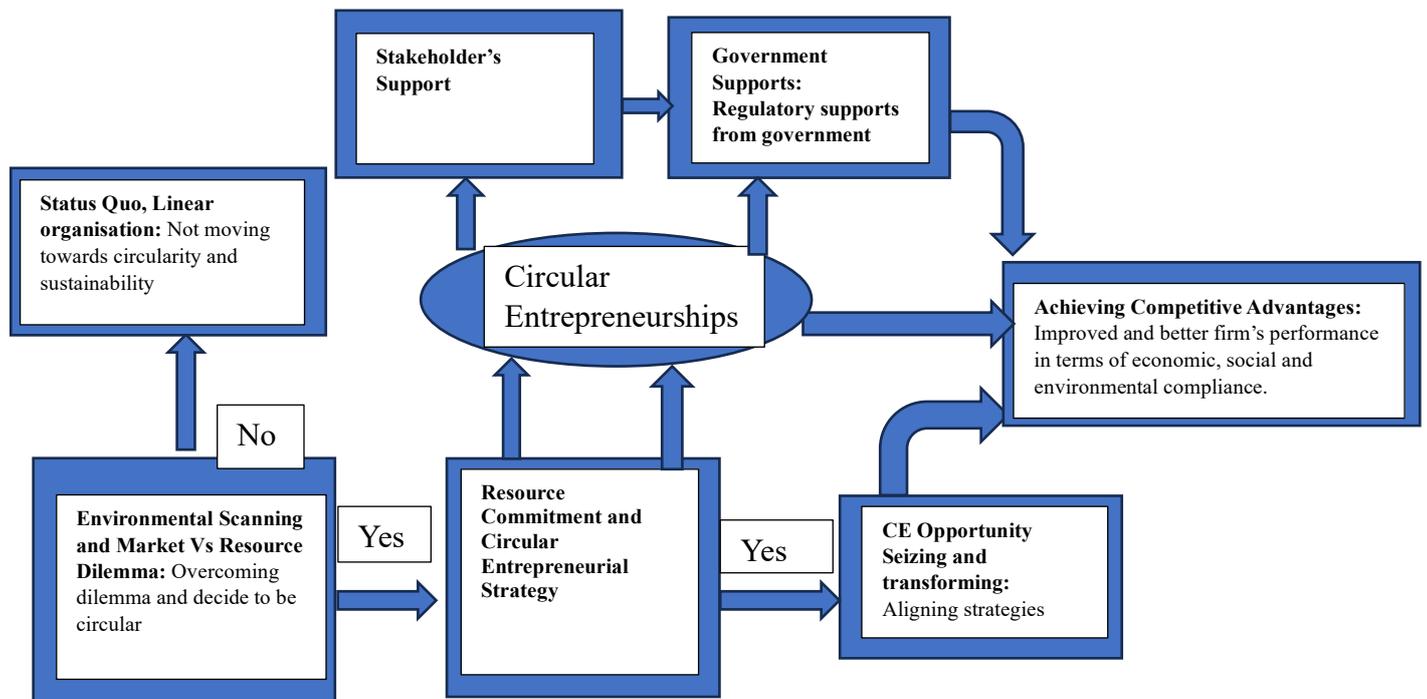


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Macro Model: Final Research Framework Based on Findings



**Figure 14. Gaining Competitive Advantage by Capitalising on Circular Economy Opportunities**