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## **Determinants of the sustainable entrepreneurial ecosystem in Tunisia: The role of stakeholders and entrepreneurial culture**

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**Abstract**--The concept of an entrepreneurial ecosystem refers to a network of interdependent actors and factors that collectively foster entrepreneurship, innovation, and regional economic growth. While previous research has emphasized the role of entrepreneurial ecosystems in stimulating economic development, limited attention has been devoted to understanding their sustainability dimension, particularly in emerging economies. This study aims to examine the determinants of a sustainable entrepreneurial ecosystem within the Tunisian context. Drawing on the theoretical foundations of entrepreneurial ecosystem research, this paper investigates how stakeholder collaboration and entrepreneurial culture influence the perceived strength of sustainable entrepreneurial ecosystems across different Tunisian regions. Data were collected through an online survey administered to 214 stakeholders, including startups, incubators, accelerators, investors, coworking spaces, and governmental and non-governmental institutions. The findings reveal regional disparities in the strength of sustainable entrepreneurial ecosystems, highlighting that strong stakeholder collaboration and a robust entrepreneurial culture are key drivers of sustainability.

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Conversely, differences in stakeholders' interests do not significantly affect ecosystem strength. This research contributes to the growing literature on sustainable entrepreneurship by providing empirical insights into how contextual and cultural factors shape the development of sustainable entrepreneurial ecosystems in emerging economies. Policy implications and directions for future research are discussed.

**Keywords**---sustainable entrepreneurial ecosystem, stakeholder collaboration, entrepreneurial culture.

## I. Introduction

The concept of an entrepreneurial ecosystem refers to a network of relationships that enables interactions among a wide range of institutional and individual actors to foster entrepreneurship, innovation, and regional economic growth (Isenberg, 2010, 2011). Many countries recognize the entrepreneurship sector as an area of economic importance, which results in undertaking some efforts to identify, measure, understand, and promote entrepreneurship at the national level. Leendertse, Schrijvers, & Stam (2021) suggest that an entrepreneurial ecosystem is defined as « a set of interdependent actors and factors that are governed in such a way that they enable productive entrepreneurship within a particular territory ».

Some researchers argue that entrepreneurship will have an impact on economic development if an appropriate institutional framework is in place, including formalization of informal institutions and improved property rights for entrepreneurs (Boettke and Coyne, 2003). Moreover, a certain threshold of development must be reached by the given country for entrepreneurship to effectively unlock economic development (Valliere and Peterson 2009). The term entrepreneurial ecosystem has been used by Prahalad (2005) and Cohen (2006) to describe the conditions in which individuals, firms, governments, civil society, and development partners come together at the regional level to support entrepreneurial activities in order to generate economic wealth and prosperity. Consequently, existing research emphasizes the role that a strong entrepreneurial ecosystem can play in stimulating economic growth (Bhawe and Zahra, 2017).

Competitors, suppliers, buyers, and customers can also be considered entrepreneurial stakeholders, stimulating the development of an entrepreneurial ecosystem. Entrepreneurial ecosystems are a multi-stakeholder phenomenon (Brown and Mason 2017). National culture can be an important explanatory variable for a region's economic development and its impact on entrepreneurship (Liñán and Fernandez-Serrano, 2014).

Simatupang et al. (2015) examined the process of creating and developing sustainable entrepreneurial ecosystems to support innovation and new business creation. Adopting Cohen's (2006, p.3) definition, the sustainable entrepreneurial ecosystem can be defined as: "...A group of interconnected actors within a local

geographic community committed to sustainable development through the support and facilitation of sustainable new ventures."

Although, previous research suggest that the sustainable entrepreneurial ecosystem can be considered as a regional development strategy with the goal of developing sustainable new businesses that create economic value in a community (Cohen, 2006; Spigel and Harrison, 2018). However, little is known about sustainability dimension of entrepreneurial ecosystem. There is also a lack of empirical knowledge on how entrepreneurial ecosystems become sustainable and the interrelationship between contextual factors and sustainable entrepreneurial ecosystem (Bischoff et Volkman, 2018; Stam, 2015).

Therefore, recent research suggests the necessity to open the black box of entrepreneurial ecosystems and to better understand the interaction between different actors on the regional context and their impact on sustainability (Content, Bosma, Jordaan and Sanders 2020; Guéneau, Chabaud and Sauvannet, 2022; Roundy 2017).

In the Tunisian context, the entrepreneurial ecosystem is still in the early phase of its development. The Tunisian government is well aware of the importance of creating startup hubs and passed a Startup Act in 2018 ; a legal framework designed to boost innovation and foster entrepreneurship. In Tunisia, the startup ecosystem is still in the early phase of its development (Global Startup Ecosystem Index 2022). Crystallising the legal framework for start-ups was a grassroots movement led by multiple stakeholders, including entrepreneurs, tech hubs and other start-up support organizations.

In this paper, we aim to examine the determinants of sustainable entrepreneurial ecosystem in the Tunisian context. Specifically, this research draws attention to the impact of different stakeholders and entrepreneurial culture on the perceived strength of a sustainable entrepreneurial ecosystem.

The paper is structured as follows. The next section provides a literature review and the hypothesis development. Next, we present the methodology which discusses the data collection, followed by the results and discussion. We conclude with implications and directions for future studies.

## **II. Literature Review: Hypothesis development**

### **1. Entrepreneurial Ecosystem**

During the last decade, the concept of entrepreneurial ecosystems has captured the attention of academics and practitioners. Different research models and data were produced contributing to different definition (Stam, 2015). The literature on entrepreneurial ecosystems stems from the environmental approach of entrepreneurship where interactions with a firm and its environment are examined. The entrepreneurial environment can therefore either hinder or support entrepreneurship: « A supportive external environment, however, will mitigate these barriers and encourage entrepreneurial potential » (Lee & Peterson, 2001). Environmental factors in this context may include cultural, economic,

political, or social forces in addition to a support system, family ties, or financial resources (Blood Good et al, 1995).

A multitude of models and approaches emerge from the contemporary literature on the entrepreneurial ecosystem. However, « there is not yet a widely shared definition of the concept among researchers or practitioners » as noted by Stam (2015). Isenberg (2010) states that « the entrepreneurship ecosystem consists of a set of individual elements-such as leadership, culture, capital markets, and open-minded customers-that combine in complex ways ». Stimulating growth and business creation in a specific region depends largely on these elements integrated into a holistic system (Isenberg, 2010).

Entrepreneurial ecosystems play an important role in founding and growing firms (Isenberg 2010) and determining the long-term prospects for regional development (Etzkowi and Klofsten 2005; Simatupang et al, 2015) and sustainable urban development (Wirtz and Volkmann 2015). Although scholars do not agree on a consistent and applicable definition of entrepreneurial ecosystems (Roundy et al, 2018; Stam 2015), however, they share the collective view of its systemic nature (Pankov et al, 2019).

Stam (2015, P. 5) emphasizes that « systemic conditions are at the heart of the ecosystem ». The systems approach to ecosystems allows for a holistic consideration of entrepreneurship by taking into account the activities of multiple actors as well as their interrelationship with a variety of contextual factors (Erina et al, 2017; Roundy et al, 2018).

Van Rijnsoever (2020, p. 2) states that an entrepreneurial ecosystem as « a set of actors that interact and exchange resources in a network under an institutional regime and infrastructure ». The main elements of this definition are the involvement of actors in terms of people or organizations that influence entrepreneurial behavior and the impact of networks to facilitate information exchange. This means that entrepreneurial ecosystems are similar to innovation systems, but differ in their focus on value creation (Ranjan and Read, 2014). The entrepreneurial ecosystems approach suggests that the environmental context influences how entrepreneurship progresses in the marketplace. Thus, it focuses on interactions rather than the innovation systems approach that emphasizes innovation. We note that these definitions highlight the diversity of the components of the entrepreneurial ecosystem and the interaction between the components of the system. Thus, we note that the environmental factors and the set of actors are two components of an entrepreneurial ecosystem in a geographical space that allow the creation and development of firms (Spilling, 1996).

Recently, Leendertse et al (2021) suggests that an entrepreneurial ecosystem is defined as « a set of interdependent actors and factors that are governed in such a way that they enable productive entrepreneurship within a particular territory ». The concept of an entrepreneurial ecosystem refers to a network of relationships that enables interactions among a wide range of institutional and individual actors to foster entrepreneurship, innovation, and regional economic growth (Isenberg, 2010, 2011).

Entrepreneurship plays a crucial role in generating economic growth, regional development, innovation, and wealth creation. The term entrepreneurial ecosystem has been used by Prahalad (2005) and Cohen (2006) to describe the conditions in which the individuals, firms, governments, civil society, and development partners come together at the regional level to support entrepreneurial activities in order to contribute to economic wealth and prosperity. Consequently, existing research emphasizes the role that a strong entrepreneurial ecosystem can play in stimulating economic growth (Bhawe and Zahra, 2017).

Competitors, suppliers, buyers, and customers can also be considered entrepreneurial stakeholders, stimulating the development of an entrepreneurial ecosystem. Entrepreneurial ecosystems are a multi-stakeholder phenomenon (Brown and Mason 2017). National culture can be an important explanatory variable for a region's economic development and its impact on entrepreneurship (Liñán and Fernandez-Serrano, 2014).

Simatupang et al. (2015) examined the process of creating and developing sustainable entrepreneurial ecosystems to support innovation and new business creation. Adopting Cohen's (2006, p.3) definition, the sustainable entrepreneurial ecosystem can be defined as: "...A group of interconnected actors within a local geographic community committed to sustainable development through the support and facilitation of sustainable new ventures."

Although, previous research suggest that the sustainable entrepreneurial ecosystem can be considered as a regional development strategy with the goal of developing sustainable new businesses that create economic value in a community (Cohen, 2006; Spigel and Harrison, 2018). However, little is known about sustainability dimension of entrepreneurial ecosystem. There is also a lack of empirical knowledge on how entrepreneurial ecosystems become sustainable and the interrelationship between contextual factors and sustainable entrepreneurial ecosystem (Bischoff et Volkmann, 2018; Stam, 2015).

Therefore, recent research suggests the necessity to open the black box of entrepreneurial ecosystems and to better understand the interaction between different actors on the regional context and their impact on sustainability (Content, Bosma, Jordaan and Sanders 2020; Guéneau, Chabaud and Sauvannet, 2022; Roundy 2017).

In this paper, we aim to examine the determinants of sustainable entrepreneurial ecosystem. Specifically, this research draws attention to the impact of different stakeholders and entrepreneurial culture on the perceived strength of a sustainable entrepreneurial ecosystem.

## **2. Determinants of the Sustainable Entrepreneurial Ecosystem**

### **2.1. Stakeholders Theory**

The concept of stakeholders is defined as « any group or individual who can affect or is affected by the achievement of the organization's objectives » (Freeman,1984,

p.46). Previous research assumes that entrepreneurial success depends on the support entrepreneurs receive from others actors (Hanlon and Saunders 2007).

Phillips et al (2019) suggest that stakeholders are important to businesses through three main mechanisms: developing knowledge, developing expertise, and developing new skills. By developing knowledge, stakeholders can access information that can help increase their learning capabilities. This is an important way to expose a company to new sources of information that can be used in new innovation projects. By gathering knowledge from other sources, it increases the level of technical and other knowledge that may be difficult to obtain. Moreover, building expertise means finding the right people with the right skills. Some forms of knowledge are hard to obtain, so it is important that companies have access through their stakeholders to find people who can mentor or teach others a specific skill. Developing new skills involves using stakeholder relationships to learn and acquire new skills.

However, stakeholder theory states that interests, needs, and goals generally vary among these stakeholder groups (Freeman, 2010 ; Bischoff, 2019). Moreover, the literature acknowledges the importance of stakeholder support to the survival of any business and proposes that interests and opinions of stakeholders must be addressed in order to maximize their positive impact and minimize their negative impact (Freeman, 1984 ; 1994 ; Laplume et al., 2008).

Thus, the management of stakeholder involves identifying the different stakeholders and their interests and involving them in decision-making process to consider and balance their interests (Chandler and Werther, 2014; Edelenbos and Klijn, 2006; Hillman and Keim, 2001).

Stakeholder theory builds on the notion of systems theory by assuming that organizations are embedded in their environment and should not be studied in isolation. Entrepreneurship thrives in ecosystems in which multiple stakeholders play key synergistic roles, often requiring multi-stakeholder collaboration (Van de Ven, 1993). Stam (2015) defines entrepreneurial ecosystem as « a bundle of different factors and actors that interact organized to develop favorable environments towards entrepreneurship ». Therefore, the formation of entrepreneurship ecosystems implies that the stakeholders involved collaborate to create conditions conducive to entrepreneurial activities. This notion implies that all stakeholders and actors work together to support entrepreneurs to create and develop new businesses (Pita et al, 2021).

### **2.1.1. Sustainable entrepreneurial ecosystem and Stakeholder interests**

Entrepreneurial ecosystems are composed of a variety of different stakeholders or support programs, including those supported by regional/subnational/national governments, public sector organizations such as universities, and private organizations. Each stakeholder has different or related goals and functions, thus governance mechanisms for entrepreneurial ecosystems must guide collaborative rather than isolated actions (Spigel ,2016).

According to Kale and Arditì (1998), stakeholder support and cooperation are essential for the survival of new businesses. It was found that stakeholder theory

has been widely used in sustainability research (Hörisch et al., 2014). In terms of sustainability management, the focus has been on stakeholder management of large multinational companies. However, a lack of attention given to sustainability on small and medium-sized enterprises (e.g., Carroll & Buchholtz, 2014; Clarkson, 1995; Freeman, 2010; Freeman & McVea, 2001; Gomes et al., 2014; Hillmann & Keim, 2001; Hörisch et al., 2014).

Research on entrepreneurial ecosystems has steadily grown over the past decade, with an increasing number of publications in the field (e.g., Isenberg, 2010, 2011; Kumaraswamy et al., 2008; Motoyama and Watkins, 2014; Spilling, 1996; Zahra and Nambisan, 2011). Yet, few researchers have focused on the sustainability aspects of entrepreneurial ecosystems (Cohen, 2006; Van de Ven, 1993). For example, Parrish and Foxon (2009) argue that sustainable entrepreneurs have the potential to shape specific ecosystems. Similarly, external factors of the environment and entrepreneurial ecosystem have received less attention in the context of sustainable entrepreneurship (Cohen, 2006; Lorne, 2009). Thus, some authors highlight the need for future research to study macro-environments and stakeholder engagement in sustainable entrepreneurship (Lorne, 2009 ; Belz and Binder, 2015).

Entrepreneurship thrives in ecosystems in which multiple stakeholders play key synergistic roles, often requiring multi-stakeholder collaboration (Van de Ven, 1993). Stakeholders are any entity that has an interest, currently or potentially, in supporting and encouraging more entrepreneurship in a specific geographic area. Stakeholder theory assumes mutual relationships between stakeholder groups. These stakeholders are not only influencing an organization or company, but they can also shape its environment (Freeman et al., 2014).

Brown and Mason (2014) highlight the importance of institutional foundations for the stimulation of a dynamic interaction between different actors, institutions, and processes. The literature acknowledges that entrepreneurs, entrepreneurial institutions, and entrepreneurial infrastructures influence the local dynamics and contribute to new stakeholder needs which impact the emergence of entrepreneurial ecosystems ( Brown and Mason, 2014 ; Pita et al, 2021).

Furthermore, previous research argue that shared vision and support among stakeholders about the sustainability facilitate the creation of a sustainable entrepreneurial ecosystem (Spence et al, 2011 ; Simatupang et al, 2015). Similarly, research on entrepreneurial strategies demonstrates the importance of bringing diverse stakeholders together around a common goal (Noireaux, 2015). It suggests that the long-term success of an organization may depend on its ability to satisfy dynamic and evolving stakeholder needs and generate positive and sustainable relationships with them (Voss et al., 2005).

According to Bischoff (2019), a group of stakeholders with high support, shared vision and common interests can be advantageous for the emergence of a sustainable entrepreneurial ecosystem. Stakeholder theory assumes that needs, interests, and opinions generally vary across stakeholder groups (Freeman 2010). Research highlights the difficulty of balancing the interests of different actors, or stakeholders, in an entrepreneurial ecosystem (Nambisan and Baron 2013).

Therefore, paying attention to stakeholders' interests and gaining both their support and resources is critical to the success of an organization or project (Berman et al., 1999; Choi and Shepherd, 2005; Clarkson 1995). From the same perspective, the literature argues that there may be differences in stakeholder interests, and stakeholders have different views on project success (Davis, 2014). Similarly, the decision to provide support or not may vary among stakeholders based on individual perceptions of a particular organization (Choi and Shepherd, 2005). Thus, stakeholders providing support might be biased and perceive a sustainable entrepreneurial ecosystem more positively than stakeholders receiving support (Bischoff, 2019).

Hence, following the literature, Hypothesis 1.a is formulated :

*Hypothesis 1.a: Differences among stakeholders' interests is negatively correlated with the perceived strength of the sustainable entrepreneurial ecosystem.*

### **2.1.2. Sustainable entrepreneurial ecosystem and Stakeholders Collaboration**

In general, collaboration involves a relationship between organizations that participate and mutually agree to jointly achieve goals, share information, resources, benefits, and are responsible for making joint decisions to solve various problems (Galaskiewicz, 1985; Oliver, 1990; Hardy, Phillips, and Lawrence, 2003). Tadjudin and Raharja, (2010) state that collaboration is the action of parties to produce mutual satisfaction on a "win-win" basis. From the perspective of cooperative stakeholders, collaboration refers to inter-organizational relationships, intergovernmental relationships, strategic alliances, and multi-organizational networks.

Stakeholder theory emphasizes the importance of collaboration and partnership among key stakeholder groups (Freeman, 1984; Freeman et al., 2014). Scholars argue that stakeholder's interaction is considered an important key in developing sustainable entrepreneurial ecosystems (Uddin et al, 2015). An important factor in building entrepreneurial support is the sharing of key information among stakeholders and the interaction between different stakeholders in terms of "entrepreneurial connectors." (Mason and Brown 2014, p. 77 ; Bischoff, 2019). The connectivity and interaction between stakeholders play a significant role in creating a strong entrepreneurial ecosystem (Bischoff, 2019) since "entrepreneurial ecosystems involve a network, a system, of interactions of individuals and organizations" (Colombo et al. 2017; p.1).

Furthermore, Sedlacek and Gaube (2010) reveal that a lack of networks and cooperation between stakeholder groups can hinder the implementation of sustainable regional strategies. Moreover, network theory reveals that the success of new firms may depend on its network connections (Littunen, 2000). Strong networks can stimulate innovation and efficiency, creating a competitive advantage (Littunen, 2000). Resource-based partnerships are also important for sustainability-oriented businesses (Meyskens and Carsrud, 2013). Stakeholder collaboration should therefore ideally be sustainable and consistent to enable knowledge exchange and network development (Autio and Thomas, 2014). This is also true for sustainable entrepreneurial ecosystems, although the focus here is on sustainability of collaboration among stakeholders (Uddin et al., 2015). Strong

alignment between an entrepreneur and the shared vision of an entrepreneurial ecosystem increases the chances of shared value creation (Autio and Thomas, 2016).

In this perspective, this shared vision must be focused on sustainability in order to create the conditions for the development of a sustainable entrepreneurial ecosystem. They indicate that intense collaboration with stakeholders fosters a strong global network and entrepreneurial infrastructure. Intense stakeholder communication and exchange at the systemic level can provide a better overview of the sustainable entrepreneurial ecosystem as a whole and thus ensure that support mechanisms and structures are aligned, coherent, and well-coordinated. This relationship-based structure facilitates how resources flow through an ecosystem so that entrepreneurs can access them (Spigel and Harrison, 2018).

By observing and interacting with others, entrepreneurs also learn new skills, learn how to acquire potential customers, and learn how to obtain external funding (Nicotra et al., 2017). Researchers have often recognized that ecosystems are inherently based on cooperation and less on competition and profit maximization (Audretsch et al., 2018 ; Spilling, 1996; Suresh and Ramraj, 2012; Zahra and Nambisan, 2011). Therefore, the formation of entrepreneurial ecosystems implies that the stakeholders involved collaborate to create conditions for entrepreneurial activities. This notion implies that all stakeholders and actors work together to support entrepreneurs to help them develop new businesses. Stakeholder support and collaboration can help shape and develop entrepreneurial ecosystems (Zahra and Nambisan, 2011).

Hence, based on previous research, Hypothesis 1.b is formulated :

*Hypothesis 1.b: Strong stakeholders' collaboration in a region is positively correlated with the perceived strength of the sustainable entrepreneurial ecosystem.*

## **2.2. Differences of Sustainable Entrepreneurial Ecosystem: Regions and Culture**

The literature acknowledges the differences between entrepreneurial ecosystems among regions (Cohen, 2006; Isenberg, 2010; Stam, 2015) and the importance of entrepreneurial culture in shaping the development of entrepreneurial ecosystems (Castaño et al., 2015; Neck et al., 2004). The following paragraph outlines these differences based on a literature review.

### **2.2.1. Sustainable entrepreneurial ecosystem and Regions**

Researchers have often recognized that the concept of entrepreneurial ecosystem and regional development are strongly linked because of its new value creation on specific regions (Acs et al., 2017; Neck et al., 2004).

Entrepreneurial ecosystem refers to an interconnected set of actors in a regional environment that provides the basic infrastructure for entrepreneurial activities (Binkley, 2015; Mason and Brown, 2014). Several studies show that the regional context play a significant role in developing different forms of entrepreneurship, including the quality, sustainability, and growth potential of new ventures, which will influence the regional growth (Audrestch and Fritsch, 2002; Fritsch and Mueller, 2004; Fritsch, 2008; Audretsch and Keilbach, 2004 and 2008; Aubry et al. 2015).

Based on a systemic approach, entrepreneurship refers to activities of multiple actors (Erina et al., 2017; Roundy et al., 2018). This approach reveals that the actions of entrepreneurs are part of a complex, multi-level economic system (Ács et al., 2014; Volkmann et al., 2021). These actions are largely influenced by contextual features and system components (Isenberg, 2010; Neck et al., 2004; Spigel, 2017; Stam, 2015; Szerb et al., 2013; Woolley, 2014). In recent studies of entrepreneurial ecosystems, increasing attention has been paid to issues of sustainability (Pankov et al., 2021; Roundy et al., 2018; Volkmann et al., 2021).

Moreover, entrepreneurial ecosystems are geographically bounded: researchers consider ecosystems as a spatial (Audretsch, 2017 and Stam, 2015) and essentially local concept (Cohen, 2006). According to Isenberg, it is essential for governments to adapt policies to their own local culture and entrepreneurial climate (Isenberg, 2010). Several studies have shown significant differences between European regions, and even within the same country, in start-up initiatives and business growth (Belitski, 2010 and Fritsch, 2014; Malecki, 2018). Indeed, when a region is characterized by high unemployment, we generally find "push" entrepreneurship (Audrestch and Fritsch, 2002; Fritsch and Mueller, 2004; Fritsch, 2008; Audretsch and Keilbach, 2004 and 2008; Audretsch, 2007; Aubry et al, 2015). In this case, unemployed individuals or individuals with poor wage prospects may become entrepreneurs simply to earn a living (Oxenfeldt, 1943). In this context, business creation has very little influence on the level of economic development. However, "pull" entrepreneurs are motivated by new innovative ideas and the created firms perform better and have a positive impact on regional development. Thus, previous research suggest that some regions produce more "pull" entrepreneurs than others and, with them, more jobs and economic growth (Reynolds et al, 1994; Fritsch and Storey, 2014).

From the same perspective, Bischoff (2019) shows that there is a reciprocal relationship between entrepreneurs and their regional environment. On the one hand, entrepreneurs can benefit from a strong and supportive environment. On the other hand, an environment can benefit from strong entrepreneurial activities. The entrepreneurial ecosystem represents the set of interdependent actors connected by complex interactions within a specific region to foster entrepreneurship and new business creation (Theodoraki, 2019). It is also considered a multi-scale, multi-actor phenomenon that varies by context (Brown and Mason, 2017).

Thus, research generally concludes that entrepreneurial ecosystems are different, and their sustainability varies from region to region (Bischoff, 2019; Brown and Mason, 2017; Isenberg 2010; Stam, 2015).

Hence, following the literature, Hypothesis 2.a is formulated:

*Hypothesis 2.a: The perceived strength of the sustainable entrepreneurial ecosystem is different among regions*

### **2.2.2. Sustainable entrepreneurial ecosystem and Entrepreneurial Culture**

Culture plays an important role in shaping entrepreneurial ecosystems (Castaño et al. 2015). Culture is perhaps the most important element in the development of an entrepreneurial ecosystem; however, it is probably the most difficult element

for a community to manage and replicate (Neck et al. 2004). If community culture is essential to the evolution of an entrepreneurial ecosystem, it is fundamental to the development of a sustainable entrepreneurial ecosystem.

An entrepreneurial culture is a key factor in the success of a successful entrepreneurial ecosystem, according to Mason and Brown (2014). An understanding of a region and its entrepreneurial structure without a conceptualization of its culture and societal context is difficult (Isenberg, 2010).

Entrepreneurial culture generally refers to the values, attitudes, beliefs, assumptions, norms, and behaviors related to entrepreneurship in a certain cultural context (Wong, 2014). Entrepreneurial culture has been characterized as a type of organizational culture that embodies and embraces entrepreneurial characteristics and attributes, such as opportunity recognition, creativity, risk taking, and innovation. (Wong, 2014). A lot of researchers agree that a particular region's appetite for fostering entrepreneurs is deeply rooted in its culture and history (Audretsch, 2017; Spigel, 2017).

National culture can be an important predictor of a region's economic development and its impact on entrepreneurship (Breazeale et al, 2015; Liñán and Fernandez-Serrano, 2014). National culture can also influence individual entrepreneurial decision making, highlighting that cultural context can shape the reasoning and cognitive logic of entrepreneurs (Laskovaia et al, 2017).

Moreover, it is revealed that entrepreneurial culture in terms of local norms and values can significantly shape the entrepreneurial activities of a region (Andersson, 2015). Values can be measured not only at the personal level but also at the community level, as previous research assumes that values are similar and shared throughout society in a given region (Rokeach, 1973; Breazeale et al, 2015; Julien, 2007). An entrepreneurial culture that promotes risk-taking and values innovation is considered to contribute to entrepreneurial behavior (Breazeale et al, 2015; Isenberg 2010).

According to Isenberg (2010), it is essential that governments adapt their policies to their own local entrepreneurial culture and climate. Researchers suggest that a culture with strong entrepreneurial awareness has a positive effect on entrepreneurial motivation, intention, and behavior (Fretschner and Weber 2013; Levie et al, 2014).

Thus, with respect to entrepreneurial activities, cultures with a focus on sustainability are presumed to be more involved in sustainable entrepreneurial activities than cultures where sustainability is less important (Spence et al. 2011). Several authors emphasize the importance of sustainability awareness for entrepreneurial behaviors that is not only relevant for large organizations, but also for small and medium-sized enterprises (Garbie 2015; Neck et al., 2004; Newell and Moore 2010).

Indeed, entrepreneurial culture has a significant impact on the evolution of an entrepreneurial ecosystem as it represents the social aspect that is a vital factor for sustainability (Margalit and Halbertal, 1994; Neck et al., 2004).

Hence, based on previous research, Hypothesis 1.b is formulated:

*Hypothesis 2.b: Strong entrepreneurial culture in a region is positively correlated with the perceived strength of the sustainable entrepreneurial ecosystem.*

### III. Methodology

#### 3.1. Data Collection

Data were collected from Tunisian entrepreneurial ecosystem using a survey questionnaire. Our questionnaire was administered exclusively online, explaining the purpose of our survey and guaranteeing the confidentiality of the data. We select for our investigation different stakeholders which are based on different regions on Tunisia. The targeted questionnaire respondents include startups, incubators or accelerators, technological parks, investors, coworking spaces, governmental institutions, non-governmental institutions, and business angels. After a process of refinement, we obtained useful questionnaires from 214 different Tunisian stakeholders based on different regions. Data analysis was carried out using SPSS 21 software. This software allows us to present a descriptive analysis of the sample and to test the hypotheses of our research.

#### 3.2. Measures of variables

The strength of the sustainable entrepreneurial ecosystem (SEE) is the dependent variable. The variables of interest are Stakeholder Collaboration (SC), Entrepreneurial Culture (CEnt), Region (Reg), and Entrepreneurial Ecosystem Actor Identification (Iden). The control variables are gender (Gen), age (Age), Education level (Edu), Entrepreneurial awareness (ConEntr), and Sustainability awareness (ConDura).

All measures are presented in Appendix A.

### IV. Findings and Discussion

#### 4.1. Descriptive Statistics

It is useful to examine the characteristics of the sample on which our research was conducted. The descriptive analysis of the sample follows the structure of the questionnaire, i.e. there will first be a description of the actors contacted, followed by a description of the profile of the survey participant.

**Table 1. Respondent Demographics**

<b>Respondent Profile</b>	<b>Sample: N=214</b>
<b>Stakeholder' Identification</b>	
Entrepreneur/Startup	<b>130</b>
Incubators or accelerators	<b>6</b>
Investor	<b>2</b>
Incubation Program	<b>6</b>
Coworking Space	<b>5</b>
Public Services	<b>2</b>
Media	<b>6</b>
Project Idea	<b>37</b>
Others	<b>20</b>

<b>Respondent Profile</b>		<b>Sample: N=214</b>
<b>Region</b>		
Tunis (Capital)		<b>134</b>
Sahel		<b>37</b>
Center Est		<b>20</b>
Center Ouest		<b>5</b>
North		<b>12</b>
South		<b>5</b>
<b>Gender</b>		
Female		<b>67</b>
Male		<b>147</b>
<b>Age</b>		
<29 Years		<b>111</b>
30-39		<b>71</b>
40-49		<b>27</b>
50-59		<b>4</b>
<b>Education</b>		
No higher education		<b>11</b>
Higher Education		<b>58</b>
Master' Degree		<b>126</b>
Phd		<b>19</b>

Respondent demographics are presented in Table 1. The correlation analysis in Table 2 shows the correlations between variables.

**Table 2. Correlation between variables**

<b>Variables</b>		<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	
<b>Dependent variable</b>	<b>(1)</b> Sustainable Entrepreneurial Ecosystem (SEE)	1								
	<b>Controls</b>	<b>(2)</b> Gender (Gen)	- ,052	1						
		<b>(3)</b> Age (Age)	- ,188**	,054	1					
	<b>(4)</b> Education level (Edu)	- ,063	- ,097	,263**	1					
<b>Independent Variables</b>	<b>(5)</b> Ecosystem Actor Identification (Iden)	,702**	- ,113	- ,134	- ,061	1				
	<b>(6)</b> Stakeholder Collaboration (SC)	,617**	,006	- ,180**	- ,060	,494**	1			
	<b>(7)</b> Entrepreneurial Culture (CEnt)	,516**	- ,018	- ,102	,037	,617**	,718**	1		
	<b>(8)</b> Region (Reg)	- ,242**	- ,040	,018	- ,053	- ,224**	- ,279**	,026	1	

## 4.2. Regression Analysis

Table 3 presents the results regarding the perceived strength of the entrepreneurial ecosystem in Tunisia. This table provides the OLS regression results. Table 3 shows that the different perceptions of the sustainable entrepreneurial ecosystem across regions are significant and positively correlated in Model 2. However, the differences in perception of the sustainable entrepreneurial ecosystem among stakeholders are not significant. This reveals that different stakeholders have a similar perception of the sustainable entrepreneurial ecosystem in a region. Furthermore, the perception of the sustainable entrepreneurial ecosystem is stronger in Tunis than in other regions. Thus, in the regression model 6, with all variables included, a significant difference between regions is observed.

We can deduce that in the Tunisian context, the perception of the strength of the sustainable entrepreneurial ecosystem is more positive in the capital Tunis than in other regions, while different stakeholders have a similar perception of the sustainable entrepreneurial ecosystem in a region. This result allows us to conclude that hypothesis 1.a is rejected while hypothesis 2.a is supported.

Models 4 and 5 indicate a positive and significant relationship with the dependent variable for stakeholder collaboration and entrepreneurial culture. This implies that the higher the perceived stakeholder collaboration for sustainable entrepreneurship in a region, the higher the assessment of the sustainable entrepreneurial ecosystem. These results support hypotheses 1.b and 2.b.

In turn, entrepreneurial culture in Tunisia reveals a positive and significant relationship with the assessment of the sustainable entrepreneurial ecosystem. This implies that the higher the estimated level of entrepreneurial culture in a region, the higher the perceived strength of the sustainable entrepreneurial ecosystem.

Regarding the control variables, a significant negative correlation can be assumed between the control variable education, which could imply that people with higher education perceive the sustainable entrepreneurial ecosystem as weaker than people without higher education.

Moreover, the results show that Age appears to be significant in the regression models. Those aged 29 and older perceive the strength of the regional sustainable entrepreneurial ecosystem as weaker than respondents aged 40 and older. Since most of the respondents with a master's degree and being in the 29+ age bracket. This implies that age and education could influence the other variables of interest. But the validity of these results is limited and requires further testing. There is no overall significant correlation between the control variables of gender on the perceived strength of the sustainable entrepreneurial ecosystem in the ultimate regression model. To further validate the results of this research, we will conduct a robustness test in the form of a robust Ologit model as shown in Table 4, which are very similar to the OLS regression model results in Table 3.

**Table 3. OLD Regression Model**

<b>Sustainable Entrepreneurial Ecosystem (SEE)</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
<b>Age (Age)</b>	-0,0262*	-0,249*	-0,243*	-0,106*	-0,160*	-0,098*
<b>Gender (Gen)</b>	-0,0126	-0,149	-0,112	-0,115	-0,090	0,031
<b>Education (Edu)</b>	-0,047**	-0,059**	-0,060**	-0,031*	-0,060*	-0,014*
<b>Region (Reg)</b>		0,184***	0,191***	0,092***	0,090***	0,051***
<b>Ecosystem Actor Identification (Iden)</b>			0,018	0,010	0,008	0,003
<b>Stakeholder Collaboration (SC)</b>				0.38**		0,070**
<b>Entrepreneurial Culture (CEnt)</b>					0.282***	0,120***
<b>R<sup>2</sup></b>	0.057	0.113	0.116	0.407	0.304	0.553

Table 4 shows the perceived strength of the entrepreneurial ecosystem in the Tunisian context. Table 4 shows a positive and significant relationship between stakeholders' collaboration and sustainable entrepreneurial ecosystem, leading to the observation that stakeholder collaboration specifically focused on sustainable entrepreneurship and tailored to the needs of sustainable entrepreneurs is very important to successfully develop strong sustainable entrepreneurial ecosystems. These results support hypotheses 1.b, 2.a and 2.b. Overall, the significance levels are almost identical between the OLS and ologit regression models. This result is similar to that of the regression model.

In Tunisia, the perceived strength of the sustainable entrepreneurial ecosystem is stronger in Tunis (the country's capital) than in other regions. Moreover, the perception of the sustainable entrepreneurial ecosystem across the entrepreneurial stakeholders is different at the regional level. This research reveals that the support and collaboration between entrepreneurial stakeholders play an important role in developing a sustainable entrepreneurial ecosystem on the regional context.

In Tunisia, the perception of entrepreneurship differs from one region to another. The perceptions of the entrepreneurial environment and culture is strongly different among regions and among stakeholders. These regional differences could be explained by the geographical distribution of startups and entrepreneurial actors throughout Tunisia.

**Table 4. Ologit Model**

<b>Sustainable Entrepreneurial Ecosystem (SEE)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>	<b>(10)</b>	<b>(11)</b>	<b>(12)</b>
<b>Age (Age)</b>	-,533*	-,532*	-,528*	-,268*	-,403*	-,257*
<b>Gender (Gen)</b>	-,267	-,312	-,239	-,254	-,322	,126
<b>Education (Edu)</b>	-,059**	-,091**	-,094**	-,132**	-,154**	-,116**
<b>Region (Reg)</b>		,350***	-,365***	-,236***	-,217***	-,173***
<b>Ecosystem Actor Identification (Iden)</b>			,036	,042	-,004	,025
<b>Stakeholder Collaboration (SC)</b>				,972***		,256***
<b>Entrepreneurial Culture (CEnt)</b>					,349**	,339**
<b>Pseudo R<sup>2</sup></b>	0.064	0.12	0.123	0.409	0.347	0.557

## V. Conclusion

The originality of this research is based on an unexplored context : Tunisia, a low-income country in Africa (Guéneau, Chabaud and Sauvannet, 2022). The Tunisian entrepreneurial ecosystem is growing with the Startup Act in April 2018 which brought life into the ecosystem. Crystallising the legal framework for start-ups was a grassroots movement led by multiple stakeholders, including entrepreneurs, tech hubs and other start-up support organisations.

This study examines the determinants of sustainable entrepreneurial ecosystem in the Tunisian context. Specifically, this research focuses on differences between regions, the role of stakeholder collaboration, and entrepreneurial culture for a strong sustainable entrepreneurial ecosystem. Results demonstrate that the strength of the sustainable entrepreneurial ecosystem is different among regions. Furthermore, this paper reveals that the key factors for a sustainable entrepreneurial ecosystem in a region are strong stakeholders' collaboration and strong entrepreneurial culture. However, findings suggest that differences among stakeholders' interests has no significant impact on the perceived strength of the sustainable entrepreneurial ecosystem in the Tunisian context.

Our variables are limited to perceptions and, therefore, subjective self-reporting. This may differ from objective measures of the strength of the sustainable entrepreneurial ecosystem, such as the number of sustainable businesses created, or the amount of funding provided.

Future research could study sustainable entrepreneurial ecosystems in universities to measure and compare sustainable entrepreneurial ecosystems in

different regions. In the Tunisian context, entrepreneurial culture is very high in Tunis (the capital) than in other regions. We can deduce that the role of the university can affect the development of an entrepreneurial ecosystem. One limitation of this work is the use of cross-sectional study. Therefore, we can not address causability relationships between the constructs. Another limitation is a lack of objective measures of the strength of the sustainable entrepreneurial ecosystem.

While this work does not address causal relationships, it offers a better understanding of the powerful role stakeholders play in shaping the entrepreneurial ecosystem in the regional level. Specifically, it provides evidence of how certain stakeholders within a specific region contribute to the development of a sustainable entrepreneurial ecosystem and where weakness occur within other regions. Local policy makers should further explain the regional differences and try to build a strong network between stakeholders. This is crucial for the development of a sustainable entrepreneurial ecosystem.

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