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CLUSTERS: ARE THEY PROPITIOUS ECOSYSTEMS WHEREIN SUSTAINABLE ENTREPRENEURS CAN THRIVE?

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Abstract

We live in an era marked by climate change issues, gaping social inequalities, and natural resource depletion. Traditionally, entrepreneurship is focused on profits but obtaining financial gain to the detriment of the environment and society is not sustainable. Future generations should also be able to meet their own needs. Therefore, sustainable entrepreneurs have an essential role in sustainable development efforts by creating financially viable and innovative business models that create environmental and social value. Clusters might contribute to this process by their dynamic structure that creates synergy among multiple actors. The literature review revealed that the impact of clusters on sustainable entrepreneurship is under-researched and that there is a gap. This article explores how sustainable entrepreneurship can emerge and thrive in clusters by reviewing the relevant literature on these concepts and analyzing several clusters fostering sustainable entrepreneurship. Finally, the article concludes with suggestions for the Turkish business context.

Keywords: Cluster, Ecosystem, Sustainable Development, Sustainable Entrepreneurship.

JEL Classification: R10, Q57, Q01, L26.

KÜMELENMELER: SÜRDÜRÜLEBİLİR GİRİŞİMCİLERİN SERPİLMELERİNE ELVERİŞLİ EKOSİSTEMLER MİDİR?

Öz

İklim değişikliği sorunlarının, derin sosyal eşitsizliklerin ve doğal kaynakların tükenmesinin damgasını vurduğu bir çağda yaşamaktayız. Geleneksel olarak girişimcilik kar odaklıdır, ancak çevre ve toplum aleyhine finansal kazanç elde etmek sürdürülebilir değildir. Gelecek nesiller de kendi ihtiyaçlarını karşılayabilmelidir. Bu nedenle sürdürülebilir girişimciler, çevresel ve sosyal değer yaratan, finansal açıdan sürdürülebilir ve yenilikçi iş modelleri oluşturarak sürdürülebilir kalkınma çabalarında önemli bir role sahiptir. Kümelenmeler, birden fazla aktör arasında sinerji yaratan dinamik yapıları ile bu sürece katkıda bulunabilirler. Literatür incelemesi, kümelenmelerin sürdürülebilir girişimcilik üzerindeki etkisinin yeterince araştırılmadığını ve bu alanda bir boşluk olduğunu ortaya koymuştur. Bu makale, bu kavramlarla ilgili literatürü gözden geçirerek ve sürdürülebilir girişimciliği teşvik eden birkaç kümelenmeyi analiz ederek, sürdürülebilir girişimciliğin kümelenmelerde nasıl ortaya çıkabileceğini ve gelişebileceğini araştırmaktadır. Son olarak makale, Türkiye'deki iş ortamına yönelik önerilerle sona ermektedir.

Anahtar Kelimeler: Kümelenme, Ekosistem, Sürdürülebilir Kalkınma, Sürdürülebilir Girişimcilik.

JEL Sınıflandırması: R10, Q57, Q01, L26.

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1. Introduction

Entrepreneurship is a research field studied since the 18th century by economists such as Adam Smith and John Stuart Mill (Greco and Jong, 2017). Traditional definitions of entrepreneurship prioritize the creation of financial value (Schumpeter, 1934). Entrepreneurs have been acclaimed if they offered great returns to their shareholders and investors. However, this constrained view of doing business proved itself to be unsustainable in the long run. Targeting only financial gain and overlooking the environmental and societal effects of the enterprise is not sustainable in our era, especially with the increasing awareness of consumers and other stakeholders.

Nowadays, getting economic value at all costs is overthrown by generating sustainable development. According to Brundtland Report (1987), the definition of sustainable development is as follows: "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Elkington (1994, 1997) contributed to this definition by introducing the concept of the Triple Bottom Line (TBL), or 3P (People, Planet, and Profit) that integrates the three dimensions of sustainability: the economic, the human, and the environmental systems. Hart and Milstein (1999) paired entrepreneurship and sustainable development concepts and presented sustainable development as an opportunity for entrepreneurs and innovators. Today, entrepreneurs are expected to mitigate their businesses' negative impacts on the environment and consider prosocial and environmental values when planning their business activities (Anand et al., 2021). In other words, sustainable entrepreneurs strive to balance the triple bottom line of social, environmental, and economic goals. In addition to profit generation, sustainable entrepreneurs aim to create value for the planet (Hanohov and Baldacchino, 2017), generate employment, and improve people's lives (Sarango-Lalangui et al., 2018). Though sustainable entrepreneurs are expected to act as key actors in sustainable development efforts, they face many challenges in merging environmental, commercial, and social logics with different values, practices, and objectives. Entrepreneurs can feel tensions when combining social and environmental values in a commercial market where financial gain is the ultimate goal (Gregory and Holzmann, 2020). Hence, they should create and align several values within their business models, and to do that, they need innovativeness, adequate information, and sufficient resources. How can sustainable entrepreneurs create innovative business models that meet these requirements? Can they reach the necessary information on their own? Are they able to find the required resources to enact their business models? Do they need assistance when following environmental and social regulations? They might achieve these multiple goals by themselves, but that will require much time, effort, and money. Therefore, being located in industry clusters seems like a better alternative since they offer an ecosystem of multiple actors that provide information, resources, and experienced labor pools.

Clusters have been a research topic for several schools of thought since Alfred Marshall's first definition of industrial districts. However, Michael Porter (1998) brought the concept to the limelight; he conceives business clusters as places wherein several complementary actors work in harmony with high productivity, innovation, and new business formation levels. Clusters offer a suitable environment for innovation as they bring together several actors that exchange information, workforce, and raw materials. Besides information flows between firms and research facilities, local knowledge spillovers and technological spillovers contribute to creating new ideas and products/services.

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Moreover, business clusters are generally milieus where state-of-the-art technologies emerge because firms devote large amounts of money to research in collaboration with universities and other institutions located there. These are vibrant environments that might function as hubs of innovation and pools of skilled workers and experts. Furthermore, they can help ventures produce new products/services that alleviate environmental worries and create new jobs with higher wages. In sum, clusters can be the ecosystems wherein sustainable entrepreneurs can emerge and grow since they provide abundant resources to these entrepreneurs.

The literature review concerning sustainable entrepreneurship and clusters revealed a research gap; there are very few articles examining sustainable entrepreneurship in clusters to the author's knowledge. The most prominent one is Cohen's (2006) article. He established the framework of a sustainable entrepreneurship ecosystem. Though he did not name the ecosystem as a cluster, his definition is very close to that of a cluster.

This paper seeks to uncover the suitability of clusters for sustainable entrepreneurship. It begins with a literature review of sustainable entrepreneurship and clusters. Then, three examples of clusters from Canada, the USA, and France hosting sustainable entrepreneurs are scrutinized. Finally, the state of sustainable entrepreneurship in Turkey is examined, and several suggestions to develop sustainable entrepreneurship in the Turkish business context are provided.

2. Literature Review

2.1. Sustainable Entrepreneurship

Sustainable entrepreneurship is a subfield of entrepreneurship that has become a topic of interest, especially in the last two decades; it is deemed a means to achieve a more sustainable future (Hall et al., 2010). Sustainable entrepreneurship serves as a link between sustainable development and entrepreneurship literature. Sustainable development has become an important concept since the 1990s. It is defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland Report, 1987). At first, the research perspective was constrained to entrepreneurial activity and its relationship with environmental problems and solutions. Then, Elkington (1997) contributed to the expansion of the concept by introducing the triple bottom line (TBL) perspective, known as 3Ps (People, Planet, and Profit). Shepherd and Patzelt (2011: 137) enumerate the elements of the 3Ps and include "the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society."

During the following years, the TBL concept became popular and entered the everyday business language. However, Elkington (2018) wrote an article in Harvard Business Review and stated that profit was still the main focus of firms though they used the TBL concept in their reports: "The original idea was (...) encouraging businesses to track and manage economic (not just financial), social, and environmental value added—or destroyed." Therefore, 3Ps comprise social, environmental, and economic impact. Furthermore, Elkington means by people the positive and negative impact an organization has on its most important stakeholders. The second P, planet, comprises the positive and negative influence an organization has on its environment. Firms can reduce their carbon footprint, use fewer natural resources, decrease toxic materials, remove waste, and restore the harm they did to nature by reforesting, for instance.

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The third P, profit, refers to the positive and negative effect an organization has on the local, national and international economy, such as creating employment and wealth, generating innovation, and paying taxes (Kraaijenbrink, 2019). In sum, a sustainable entrepreneur balances economic health (profit), social equity (people), and environmental resilience (planet) through entrepreneurial behavior (Hockerts and Wüstenhagen, 2010).

Greco and Jong (2017) assert that the common ground between entrepreneurship and sustainability is longevity, which means creating long-lasting products or services. However, they state that longevity should be replaced with a positive impact in the case of sustainable entrepreneurship because the needs of future generations cannot be accurately predicted since they change rapidly. Therefore, being adaptive is of central importance, and the ultimate goal of sustainable entrepreneurs should be creating prosperity (İyigün, 2015: 1230).

Sustainable entrepreneurship also requires innovation because it strives to positively impact society without harming the natural balance of our planet in an uncertain environment. Sustainable entrepreneurs should implement new business models, discover new resources, or find new ways of combining existing resources. Hence, they should have risk-taking abilities and exhibit an innovative attitude and alertness while complying with ethical standards. Of course, opportunity creation is as important as it is in the traditional entrepreneurship literature. Greco and Jong (2017: 14) define sustainable entrepreneurship as follows: "the discovery, creation, and exploitation of entrepreneurial opportunities that contribute to sustainability by generating social and environmental gains for others in society."

Sustainable entrepreneurship is closely related to the fields of social and environmental entrepreneurship. These three forms of entrepreneurship have some commonalities but also some differences. They all create value for others by identifying and seizing upon opportunities engendered by problems in society that have been insufficiently tackled by public or private organizations (Schaltegger and Wagner 2011; York, O'Neil, and Sarasvathy, 2016). As for the distinction between sustainable, environmental, and social entrepreneurship, it is mainly the objectives pursued by them. The main objective of the social entrepreneurs is to "create social benefits by addressing societal problems such as increasing access to healthcare, sanitation, and water in slum areas and revitalizing deprived communities" (Hoogendoorn et al., 2019: 1135). Generally, the creation of social benefits prevails over economic benefits; therefore, social entrepreneurship thrives in a not-for-profit context. Environmental entrepreneurs, though, seek profits, but they also aim to create eco-friendly businesses (Thompson et al., 2011). In the final analysis, sustainable entrepreneurship combines social and environmental entrepreneurship and integrates them into one practice.

As mentioned previously, innovation is of central importance in sustainable entrepreneurship activities. The resources of our old planet are continually deteriorating; pollution, deforestation, and global warming issues are just some of the problems that will threaten the sustainability of life for future generations. The old techniques used to get mass production are obsolete, and they need to be replaced by eco-friendly ways of producing. In addition, organizations should strike a balance between the interests of their business and those of the multiple stakeholders. As a result, enterprises should put forth new products/services, new processes, new forms of organization, or new sources of supply; they need to be innovative. Traditionally, organizations used to create innovations within their walls and on their own, but the social and environmental requirements of our age necessitate a more collaborative approach to this matter.

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Therefore, clusters seem to offer an ecosystem of multiple actors who can contribute to the innovative processes. Clusters are not just geographical agglomerations of businesses belonging to the same industry; they comprise companies, suppliers, universities, research facilities, financial institutions, trade associations, and regulatory institutions.

2.2. Clusters

The origins of clusters go back to Alfred Marshall's 1890 classic, the Principles of Economics. Marshall studied specific industries in particular districts and underlined the external economies of localized specialization (Marshall, 1927). He pointed at three types of external economies (Asheim et al., 2006): a group of skillful workers, growing complementary businesses, and a local inter-firm division of labor. The incumbents of clusters work in harmony since they share explicit and tacit knowledge of business practices in a supportive social and institutional environment. There have been several terms to define local agglomerations of specialized activity, such as industrial districts, new industrial spaces, local production systems, local high-tech milieu, local and regional innovation systems, or learning regions (Asheim et al., 2006). However, Michael Porter's concept of industrial or business clusters brought them to the public attention. Porter defines clusters as "geographical concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, associated institutions (for example universities, standards agencies, and trade associations) in particular fields that compete but also co-operate" (1998: 197).

The boundaries of a cluster may vary according to the strength of the spillovers in the cluster and their importance to productivity and innovation. For example, a cluster may consist of a single city, a state, a country, or even a network of neighboring countries. Porter (2008) identifies the constituent parts of a cluster as follows: first, large firms or concentration of like firms is taken into account, and then upstream and downstream firms and institutions are examined. Next, industries that use common channels or produce complementary products and services are identified in the horizontal dimension. Then, other horizontal chains of industries that use similar specialized inputs or technologies or with different linkages to suppliers are taken into account. Afterward, institutions that offer specialized skills, technology, information, capital, or infrastructure are included. Finally, government or other regulatory bodies that have an important impact on the incumbents are added. In sum, all firms, industries, and institutions with strong linkages, whether vertical, horizontal, or institutional, are counted as members of the clusters, but those with weak or non-existent linkages can be disregarded.

Firms within a cluster have the opportunity to rapidly grasp new buyer trends because they are in contact with many firms that have strong relationships with buyers, several firms in related industries, some specialized information-generating institutions, and sophisticated buyers. Moreover, their existing relationships with cluster members, site visits, and frequent face-to-face contacts help cluster participants learn new technological, operating, or delivery possibilities. Cluster firms always have the opportunity to observe other firms directly. A firm within a cluster can rapidly acquire the new components, services, machinery, and other elements necessary for innovations. Also, local suppliers can actively take place in the innovation process; thus, their supply will exactly meet the firm's requirements. In case of new approaches, firms can easily recruit new, specialized personnel within the cluster. Thus, nearby participants contribute to innovation with their complementary resources. Another advantage of being within a cluster is that firms can experiment without incurring high costs.

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Once they know that a new product, process, or service will be successful, they can make significant commitments.

In addition to these advantages, firms need to innovate in geographically concentrated clusters because competitive pressure, peer pressure, and constant comparison are abundantly present. As the basic circumstances, such as labor and utility costs, are similar for firms within the cluster, they have to be creative in order to outwit their multiple rivals. As a result, though individual firms in the cluster cannot protect their position for a long time, they grow and perform better than firms located in non-cluster locations.

3. Examples of Sustainable Entrepreneurship in Clusters

3.1. Victoria, British Columbia, Canada

In an effort to apply the concept of entrepreneurial ecosystem literature to the development of a sustainable valley, Cohen (2006) described the framework to create a sustainable entrepreneurial ecosystem. He defined sustainable entrepreneurial ecosystems as an "interconnected group of actors in a local geographic community committed to sustainable development through the support and facilitation of new sustainable ventures." This definition can also be applied to business clusters where sustainable entrepreneurship can readily burgeon. He studied one community, Victoria, British Columbia, in Canada to explore the components of such a system. Following Neck et al. (2004), he scrutinized the formal and informal network, physical infrastructure, and culture of Victoria. Figure 1 presents the sustainable entrepreneurship ecosystem in Victoria.

The formal network comprises "a research university, regional government agencies, professional and support services (e.g., lawyers, accountants, consultants, suppliers), capital sources (e.g., venture capitalists, business angels, and banks), talent pool and large corporations." The University of Victoria (UVIC) has several departments that offer programs about sustainability, such as green legal theory taught by the law school, an interdisciplinary program developed by the school of environmental studies, a school and center of Earth and Ocean Science, a Center for Forest Biology, a Center for Social and Sustainable Innovation (CSSI) and a sustainable entrepreneurship program in the curriculum of the business school.

Governments can encourage businesses to create innovations that will contribute to sustainability. They can organize green business plan competitions, reward firms that achieve resource conservation by innovative methods, and help them create sustainable high-technology development centers. The federal government in Victoria ratified the Kyoto protocol in December 2002, which raised public awareness about global warming and greenhouse gases. In addition, it introduced an innovative program to increase the ethanol content in gasoline and offered rebates to customers who made green renovations in their homes. The federal government also founded Sustainable Development Technology Canada (SDTC) that aims to help firms in developing sustainable technologies. The private sector collaborated with the government; they provided more funds to the STDC than the government did. The regional government in Victoria created the "GoGreen" campaign by promoting alternative transportation, helping organizations in diminishing their environmental impact, and informing people on environmental challenges.

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Moreover, the provincial government funded the conversion of a former health care facility into a state-of-the-art technology park in Victoria (Vancouver Island Technology Park – VITP). Finally, the City of Victoria partnered with a local landfill and a private company to produce electricity from methane gas.

Cohen (2006) states that professional and support services are open to development in Victoria; the fast-growing technology sector attracts advisers, but they are mainly from Seattle or Vancouver. However, nowadays, the City of Victoria has developed and implemented Victoria 3.0, a long-term plan for a sustainable city that will create high-value jobs. In addition, the City collaborates with the private sector to create an Ocean and Marine Innovation Hub. Therefore, professional and support services are better than 2006 (City of Victoria, 2019).

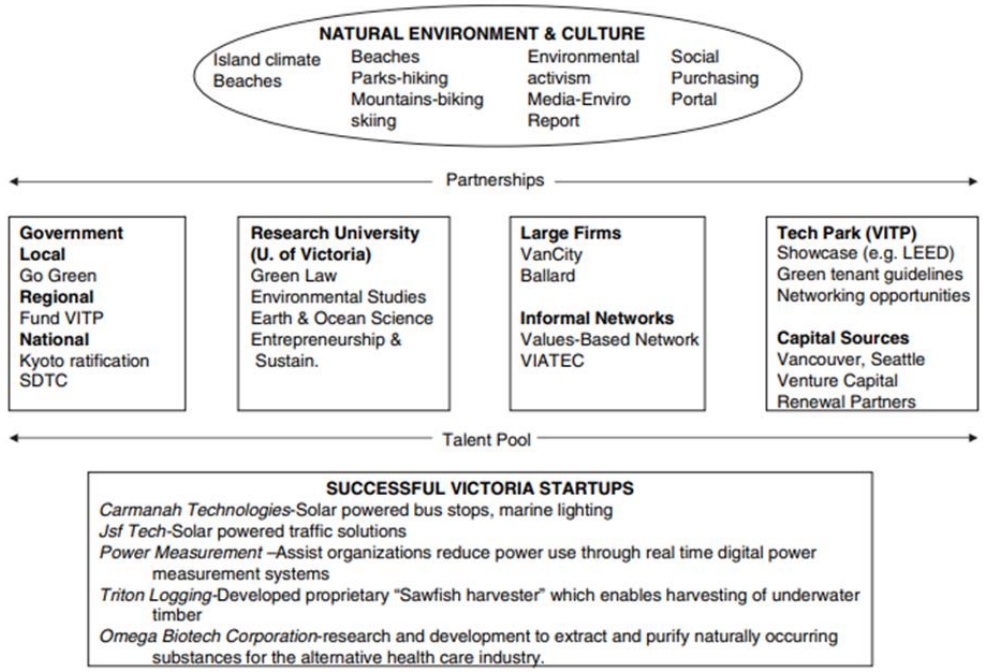

Figure 1. Sustainable Entrepreneurial Ecosystem of Victoria, B.C., Canada.

Source: Cohen (2006: 5).

As for the capital sources, Cohen (2006) reports that there are a few venture capital firms and business angels along with a very short supply of green capital, such as Renewal Partners and VanCity Credit Union. Nevertheless, the situation improves as Kozakowski (2018) analyzes the technology cluster and points at the existence of angel investors, which are former tech executives, that help incubate start-ups and assist growing firms with finding funding.

The talent pool and large corporations in Victoria had a promising potential in 2006 since there was a growing technology base in the area and three institutions of higher learning, but there were few large employers. According to the 2018 KPMG British Columbia Technology Report Card, there are several high-tech clusters in British Columbia "including software design, information and communications technology (ICT), animation, film, gaming, life sciences, cleantech, AR/VR and more." (Subeh, 2018). Also, employment has increased 24% since 2006.

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Victoria is home to a high number of tech talent; VIATEC's Economic Impact of the Technology Sector in Greater Victoria study points at the tech sector's growth in Greater Victoria over the past decade, "with industry revenues increasing more than fourfold from $1 billion in 2004 to $4 billion in 2017. The tech sector in Greater Victoria has a total economic impact of $5 billion—a 30% increase from 2013—and employs 16,775 people." (Subeh, 2018).

As for the informal networks, the Vancouver Island Advanced Technology Centre (VIATEC) is a network of over 600 technology-based organizations on the island. Another network in Victoria is the Values-Based Network (VBN), the mission of which is "to develop and promote a sustainable business culture in their community." (Cohen, 2006: 6).

The tenants of the technology park in Victoria, VITP, have a high awareness of environmental issues. As a result, the VITP was the first building in Canada to receive the LEED gold award for environmental building design. Also, the establishment of "green tenant guidelines" is another effort of VITP to attract sustainable entrepreneurial ventures to the area.

There are some limitations to the physical infrastructure in Victoria. One of them is them is the high real estate prices. Moreover, Victoria is located on an island; therefore, young and vulnerable start-up firms might prefer to locate elsewhere to avoid high shipping costs.

Finally, the culture in Victoria is suitable for the development of a sustainable entrepreneurship system. There are many environmental activists in British Columbia and Victoria. Furthermore, the media is interested in environmentally questionable practices in Victoria. In addition, the natural landscape and climate attract individuals who care about the environment and want to work for or found sustainable ventures (Cohen, 2006).

3.2. Silicon Valley, California, USA

Silicon Valley is a region in the southern part of the San Francisco Bay Area in Northern California. Silicon Valley is deemed a cluster of innovation composed of complementary and interdependent economic actors. Clusters of innovation are "global economic hot spots where new technologies germinate at an astounding rate and where pools of capital, expertise, and talent foster the development of new industries and new ways of doing business" (Engel, 2015: 37). Several technology firms, such as Apple, Google, HP, and Facebook, are located between San Francisco and San Jose.

There are several key components of the Silicon Valley cluster: research universities, entrepreneurs, investment capital, workforce, social and professional networks, business environment, and quality of life (Munroe, 2017).

Three entrepreneurial research universities in the San Francisco Bay Area are at the heart of the cluster: Stanford University, the University of California at Berkeley, and UC San Francisco. More than 150 companies in electronics, software, biotechnology, and other high-tech fields are located in the Stanford Research Park, which was created in 1951. Apart from these entrepreneurial research universities, many major corporations, such as HP, IBM, and Samsung, created R&D centers in the Valley. Also, there are other independent R&D centers spun out of university relationships, such as Stanford Research Institute (SRI) International (Engel, 2015). The mission of SRI International is as follows: "Together, we create world-changing solutions that make people safer, healthier and more productive.". Their mission allows them to help and support businesses with technologies and projects that offer environmental benefits.

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For instance, Baker Hughes acquired an exclusive license from SRI International for Mixed Salt Process technology for carbon capture. This technology is an innovative and sustainable solution to reduce CO2 emissions to meet global 2050 climate and net-zero emissions targets (SRI International, 2021).

Silicon Valley entrepreneurs are not reticent to use equity capital to finance big projects. As a result, the ownership and control of the business are shared with investors, which leads to the sale of some or the entire venture to offer an appropriate return on capital to them. Generally, Silicon Valley entrepreneurs found subsequent start-ups and contribute to "Silicon Valley's continuous self-reinvention with new industries and technologies" (Engel, 2015: 40).

Workers also adapt to the temporary nature of start-ups; they often move from one start-up to another every three to five years. Several investors and entrepreneurs, and managers left one company and used their expertise to start or invest in new companies. Moreover, most of the workforce is international; there is a flow of workers between Silicon Valley and other countries, such as India, Germany, or France. Knowledge and technology are also mobile, moving with people from one venture to another.

As for the venture capital firms in the Valley, 50 grand firms, such as Sequoia Capital, provide funds with many other investment companies. There are about 2,000 venture capitalists in Silicon Valley, most of which are located near Stanford.

Social and professional networks play an important role in the free flow of information and knowledge. Some networks are based on nationality. For instance, there are many Indian entrepreneurs; they can connect and collaborate with other Indian workers or investors. Another type of network includes former colleagues or associates who already trust each other. They can exchange information, work together, and provide resources to each other. Finally, there are networks linked to universities; networks of Stanford or Berkeley graduates and students collaborate and form entrepreneurial groups. As these networks contribute to the vitality of Silicon Valley, venture capital firms choose to be present in them and recruit people from there to tap into the strategic information and resources necessary for their activities. Social networks involve relations that are hard to disentangle from professional relationships; people are neighbors, their children go to the same schools, or they are members of the same association or non-profit organization. Moreover, the coexistence of dense innovation networks makes them resilient to external shocks or technological breakthroughs. In sum, these networks support innovation and entrepreneurship in Silicon Valley (Ferrary, 2017).

The business environment has recently become suitable for cleantech firms in the Valley. As a matter of fact, in the early 2000s, cleantech companies received support from Venture Capital firms (VCs), but VC firms lost over half of the $25 billion invested in cleantech firms. Clean investments proved to be poor performers compared to software and biomedical investments at the time as they had high risk and low returns (Erdman, 2018). However, the recent flood of easy ESG and impact capital made the VCs reconsider cleantech investments (van Lierop, 2021). ESG stands for Environmental, Social, and (Corporate) Governance; these are areas of interest for socially responsible investors. The increasing number of millennial investors contribute to the rise of these topics as important issues of sustainability. In addition, impact investments aim to generate positive, measurable social and environmental impact alongside a financial return.

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They provide capital to "sectors such as sustainable agriculture, renewable energy, conservation, microfinance, and affordable and accessible basic services including housing, healthcare, and education" (GIIN website). In 2020, VCs invested a record $17 billion into 1,009 cleantech firms. These cleantech investments are essential for the future of our planet because today, we do not yet have the technologies to achieve net-zero greenhouse emissions by 2050. Therefore, these technologies will help restrain climate change and prevent the severe and unpredictable consequences of a rise of more than 2° C above preindustrial levels (van Lierop, 2021).

The quality of life attracts people from all around the world to Silicon Valley; nice climate, beautiful scenery, several amenities, and easy access to San Francisco are the advantages of the Valley. However, traffic congestion, the high cost of housing, and fragmented public transit may deter some of them (Munroe, 2017).

Finally, Sustainable Silicon Valley is a non-profit organization founded in 2000 that aims to connect sustainable innovators, inspire positive change, and make a lasting impact. SSV's vision is as follows: "SSV champions a healthy, equitable, vibrant, clean energy Bay Area." (SSV website). According to their mission statement, they are a "think & do tank focused on water use & reuse, air quality & mobility and leading a prosperous, equitable & sustainable life in a decarbonized Bay Area." SSV envisions a net positive Bay Area by 2050. In order to attain its goal, SSV collaborates with the leading tech companies and local agencies in key focus areas of waste, energy, and water (Richmond, 2019).

3.3. The Tenerrdis Energy Cluster, Grenoble, France

Tenerrdis is an energy transition cluster in France's Auvergne-Rhône-Alpes region, including Lyon, Chambéry, Valence, Grenoble and Bourgoin-Jallieu. With 41 % of French domestic hydroelectricity production, the Rhone-Alpes region is experienced in renewable energy and has the highest number of solar panels per inhabitant in France (Grenoble INP-UGA website).

Energy transition refers to the use of renewable energy sources, that is, the abandoning of fossil-based systems of energy production and consumption, including oil, natural gas, and coal (S&P Global website). The Tenerrdis energy cluster aims to have sustainable economic growth and create long-lasting jobs in the new energy technology industries. Therefore, a network of industry, government, academia, and scientific research institutes collaborate to address the challenges of the energy transition. Tenerrdis strives to be a pioneer in distributed energy, the digitalization of the energy industry, grid flexibility, and carbon-free energy. The following industries are the main focus of the cluster: solar, hydroelectricity, biomass & biogas, wind, hydrogen, energy grids & storage, and energy-efficient buildings. There are 244 members; some of them are international companies, such as Schneider Electric, Alstom, Gaz de France, and EDF. These groups employ 100,000 employees in the Rhone-Alpes region. Also, Tenerrdis organizes approximately 60 events each year, gathering 3500 attendees.

As for the research facilities, there are 25 research organizations, universities, and technology centers; CEA (French Atomic Energy Commission), Grenoble Institute of Technology, the University of Savoy are some of them (Grenoble INP-UGA website, 2008). The data about the supported projects are impressive: 379 projects and prototypes/demonstrator systems funded, €2.1 billion in total R&D spending, and €707 million in government funding secured. Tenerrdis' main mission is to support R&D and innovation projects.

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Tenerrdis' staff helps find the right partners and sources of finance, introduces members to financers, and provides expert advice to increase each project's chances for success (Tenerrdis website).

Tenerrdis is not a cluster isolated from other clusters in Europe and around the globe. In fact, it participates in the International Cleantech Network (ICN), which involves 16 regional clusters from around the world. These networks typically comprise companies (primarily SMEs), public authorities, and research institutions. As members of ICN, cluster incumbents can expand their international networks and work with project owners located elsewhere (ICN website).

Tenerrdis is also a member of the European Cluster Collaboration Platform (ECCP), an online hub for industry clusters of Europe. The European Cluster Collaboration Platform aims to provide cluster organizations with modern tools that help them find potential partners, collaborate transnationally and internationally, develop new value chains through cross-sectoral cooperation, tap into the actual information on cluster development and ameliorate their performance as well as their competitiveness (EU- Gateway Business Avenue website). This platform is an initiative of the European Commission, funded by the EU program for the Competitiveness of Enterprises and SMEs (COSME) (ECCP website). In fact, European Commission considers clusters to be important actors in sustainable economic development; therefore, it started different projects indirectly related to the improvement of the environment. For instance, the European Cluster Alliance was founded to form a network of institutions that support transnational cooperation between clusters (Derlukiewicz et al., 2020). The alliance comprises "18 national cluster associations, public agencies or country ambassadors, more than 800 cluster organizations, 150,000 innovative businesses, and over 11,000 universities, research centers and public institutions" (European Cluster Alliance website). In sum, European Union is aware of the importance of clusters in sustainable development, and it provides the necessary tools for clusters to thrive and collaborate with other clusters.

4. Sustainable Entrepreneurship in Turkey

Environmental concerns prompted many countries to sign the Kyoto Protocol in 1992 to reduce human-emitted greenhouse gases. It went into effect in 2005, and Turkey became a party to it in 2009. As the Kyoto Protocol was expected to end by 2020, the Paris Agreement was adopted at the Paris climate conference in December 2015. It went into force in 2016 when the European Union formally ratified it by all of its members. "The Paris Agreement sets out a global framework to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1,5°C" (European Commission website). Turkey signed the agreement on April 22, 2016, but has not been a party to it yet. However, Turkey declared its intended nationally determined contribution and promised an 18% to 21% reduction in GHG emissions by 2030 compared to the Business as Usual (BAU) Scenario (Republic of Turkey Ministry of Environment and Urbanization website).

Sustainable development has recently gained traction in Turkey. For example, the Turkish Green Building Council (ÇEDBİK), a non-governmental organization with more than 100 prominent members from different industries, aims to contribute to the construction industry's development by applying the principles of sustainability (Ballı, 2019). The Sustainable Development Association, founded in 2017, contributes to the sustainable development of Turkey.

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The association identified 11 areas to work on, such as "environmental, economic, and social development; quality of life and increase in welfare; strengthening disadvantaged people; improving lifelong education and skill; development of human resources in all sectors; protection of the environment and natural systems; conservation of water and terrestrial biodiversity; sustainable production and consumption; innovation, R&D, and competitiveness; effective management and institutional capacity increase; and governance, democracy, and human rights." (Sustainable Development Association website).

Turkey is striving to increase the percentage of energy produced by renewable energy sources such as wind power, solar energy, geothermal energy, hydroelectricity, and biomass. The share of renewable energy plants in electricity generation, which was 42.5% in 2020, stood at 33.6% in January 2021. In the same period, dam-type hydroelectric power plants produced 12.7% of the total generation, while wind power plants provided 10.7% of the total generation (Hakyemez, 2021).

As mentioned before, sustainable entrepreneurship combines environmental and social entrepreneurship. There are some efforts to promote environmental entrepreneurship, but it would be wrong to assume that sustainable entrepreneurship is widely practiced in Turkey. There are some good examples of environmental endeavors, but they are still paving the way to sustainable entrepreneurship. For instance, Eczacıbaşı Group became the first representative of the World Sustainable Business Council from Turkey in 2007. The Group made a significant contribution by reducing the consolidated energy consumption of its production facilities by 9.8 million MW/h in one year. Koç Bilgi Group's Green Information Platform organized events to increase environmental awareness in society and collected 51 tons of waste through waste management activities. Thanks to the use of technologies that will reduce carbon emissions at the airports it operates in Turkey, TAV Airports has saved 3.5 million KW/h of energy from one terminal in a year. TSKB, Turkey's first carbon-neutral bank, has reduced 68% of the amount of carbon it has released to nature in a period of two years (Ballı, 2019: 476).

The BIST Sustainability Index, one of the BIST Stock Indexes launched on November 4, 2014, is another step toward sustainable entrepreneurship in Turkey. BIST Sustainability Index sets a benchmark for Borsa İstanbul companies with high performance on corporate sustainability and promotes the practice of sustainability in Turkey. With the start of the index calculation, companies that manage their corporate risks and opportunities effectively are provided with a competitive advantage, while they can develop new investment products to attract capital and funding. Fifty-eight companies take place in this index by December 1, 2020; they are all big companies, such as Arçelik, Doğan Holding, Turkish Airlines, Doğuş Otomotiv, Akbank, etc. (BIST website). Therefore, they can assume the role of a pioneer in the journey toward sustainable entrepreneurship. Hopefully, they can set an example for other ventures in different industries.

Ballı (2019: 477) states some of the issues that hinder the development of sustainable entrepreneurship in Turkey, such as the inadequacy of some incentive programs that will contribute to the development of sustainable entrepreneurship, the lack of awareness and interest of the consumer in terms of environmentally compatible goods and services, and the dearth of environment-friendly technological developments. In addition, new ventures, especially those that could not set a competitive advantage yet, have difficulties accessing the financial resources necessary for sustainable entrepreneurship. The costs they have to incur may cause problems for young companies compared to big and well-structured firms with more abundant resources.

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Therefore, the creation of a sustainable entrepreneurship ecosystem is indispensable for SMEs and young businesses. Such an ecosystem can be easily built in clusters to provide access to investors, a large and specific labor pool, knowledge, infrastructure, and technology. Furthermore, cluster members prompt each other to innovate since they reach similar resources within the cluster; they obtain a competitive advantage by outperforming their rivals through innovations.

Clusters provide a more propitious environment for SMEs and start-ups to thrive as they are surrounded by a support system that offers partners and funds necessary for their companies. There are several successful business clusters in Turkey, such as the automotive cluster in Bursa, the textile cluster in Denizli, the tourism cluster in Muğla, and the carpet cluster in Gaziantep. Sustainable entrepreneurship has not gained impetus yet, but it can be implemented in these clusters with the help of public and private institutions. In fact, the 11th Development Plan (2019-2023) published by the Presidency of Strategy and Budget (PSB) devotes an entire section to sustainable development. The government plans on facilitating access to financial support for entrepreneurs, providing the R&D support needed for the development of new technologies, taking measures to increase national and international competitiveness, increasing tax incentives and supports, providing consultancy services, and promoting clustering (Ballı, 2019). Also, the aforementioned plan sets "Sustainable Development Goals (SDGs)" for Turkey. It builds "a National Sustainable Development Coordination Board for the follow-up and review and the coordination of SDG implementation at the national level" (11th Development plan, PSB website: 212). This board will comprise representatives of local administrations, academia, the private sector, and NGOs, in addition to related public institutions.

Turkish government acknowledges the importance of clusters in the economic growth and competitiveness of its industries. The automotive industry, for example, is one of the prioritized industries by the government; the objective is to create a high-tech domestic brand along with a highly competitive supply industry. The 11th Development Plan emphasizes that "promotional activities will be carried out to ensure that the sector can benefit from the cluster support program and the cluster cooperation in the automotive industry will be supported at a higher level within this scope" (11th Development plan, PSB website: 91). The automotive cluster in Bursa is mentioned in the plan; vocational schools and vocational high schools will be established to provide a qualified labor force to the industry. Bursa is home to two factories that produce automobiles and one factory that produces minibuses and a few pickup trucks. According to the Bursa Municipality and the Chamber of Commerce and Industry, by the end of February 2018, 9,000 employees worked in these factories, and 1,824 firms operated in the automotive industry (Mutlucan, 2019).

Though the Turkish government and some companies are involved in promoting and supporting sustainable development and sustainable entrepreneurship, other measures should also be taken. First, the concept of sustainable entrepreneurship should be understood by all stakeholders. Sustainable entrepreneurship is for the benefit of all, all stakeholders should require its implementation. Hence, the curriculums of the universities should include sustainable entrepreneurship courses. In addition, people should be familiarized with the terms sustainable development and sustainable entrepreneurship. In order to do that, public service announcements can be broadcasted on television to raise awareness of sustainable development in the first instance.

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Moreover, sustainable entrepreneurs should be more present in the media; their success stories and the benefits that they provide to the environment and society should be covered. Finally, regulations, laws, and policies about sustainable development and environmental issues should be updated.

5. Conclusions and Suggestions for the Turkish Business Context

Sustainable development is the inevitable reality of our age as the resources of our old planet are not infinite, and climate change is happening. As the saying goes, we do not inherit the earth from our ancestors; we borrow it from our children. Therefore, all countries should collaborate, take precautions to prevent global warming, and preserve the natural resources to hand down a prosperous future to the next generations while generating social benefits. Turkey is a developing country that depends on foreign countries for energy, raw materials, and financial resources (Ballı, 2019). Hence, sustainable development must be a priority for Turkey, as mentioned in its 11th Development Plan. Moreover, sustainable entrepreneurship should be supported by the government and other stakeholders in order to create ecosystems wherein it can thrive.

Clusters seem the best structures where sustainable entrepreneurs can find the support and resources they need. Also, the competition among the cluster members will lead to innovations that will ameliorate the lives of their stakeholders and the prosperity of society. Furthermore, the wages and working conditions of the employees will improve in clusters that foster sustainable entrepreneurship as the social bottom line also includes the protection of workers' rights. Here are some suggestions to create and promote clusters that foster sustainable entrepreneurship:

- Raising awareness of sustainable development is imperative. People should know that we all play a part in the harmony of life today and tomorrow. Our actions will have repercussions on the upcoming generations' lives. Only people who are conscious about the issues we face today can require from companies and public institutions the necessary changes and actions. The responsibilities of every citizen in sustainable development can be taught in schools. Furthermore, sustainable development topics can be covered by the media. As the circulation figures of journals are low, talk shows and podcasts can be used for that purpose.
- Sustainable entrepreneurship should take place in the curriculum of the universities. Future young entrepreneurs should be sensitive to and knowledgeable about sustainable entrepreneurship's environmental and social dimensions as early as possible.
- Government subventions and support are necessary to create clusters that welcome sustainable entrepreneurs. Also, KOSGEB and other public institutions can provide credits or grants to sustainable entrepreneurs. In addition, the government should provide or help build these clusters' technical and technological infrastructure, such as fast internet connection, easy access to ports, highways, or airports, subsidized electricity and water prices, etc.
- Incubation centers and accelerators expert on sustainable entrepreneurship should be established.

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- Financial resources should be available for sustainable entrepreneurs. Angel investors and venture capitalists should invest in the businesses of sustainable entrepreneurs. They should acknowledge that these types of businesses require a longer time to get returns on their investment. However, the returns of sustainable ventures are for the benefit of all; therefore, investors should adopt a long-term perspective on the expected returns of their investments.
- A collaboration among academia, research institutes such as TÜBİTAK, and NGOs should be established to shape the future of sustainable development and sustainable entrepreneurship in Turkey.
- The government should update the laws, regulations, and policies about sustainable development. In addition, it should promulgate new regulations, if necessary, to support the ecosystem of sustainable entrepreneurship within clusters.
- Connection to international networks of clusters should be made. Sustainable entrepreneurs working in clusters should be willing to communicate with these networks in order to keep their businesses up-to-date with the technological changes and new knowledge created by the research organizations located there. Also, they should build virtual and/or real collaboration platforms with other clusters specialized in the same or complementary industries at national and transnational levels. They can demand the help of the public and/or private institutions to make these connections.

This article aspired to examine the suitability of clusters for the development of sustainable entrepreneurship. The literature review revealed the gap in this area; there are very few articles that combine the fields of research on clusters and sustainable entrepreneurship. The examples of clusters that are home to promising sustainable entrepreneurship implementations were scrutinized. These examples are from the clusters located in developed countries, but one can draw some practical implications for the Turkish business context even though Turkey is still a developing country and that several challenges should be handled. These challenges were identified, and several suggestions were offered to improve the conditions to create successful sustainable entrepreneurs. However, the first step is to ensure that the public grasps the importance of sustainable development. There is an urgent need to change the obsolete ways of considering businesses as providing benefits to their shareholders and investors. Moreover, the conventional ways of production incur environmental and social costs. New generations deserve to inherit a life that is healthy, fair, and prosperous. Sustainable entrepreneurship may be a way to achieve a better future, and clusters can be the incubators for sustainable entrepreneurs.

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