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Toward a Conceptual Framework to Foster Green Entrepreneurship Growth in the Agriculture Industry

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Abstract: In recent times, the importance of green entrepreneurship in the socio-economic development, environmental management, and prosperity of underprivileged societies has widely been acknowledged by both academics and policymakers alike. Despite this importance, there is a lack of research on what the external and internal factors that support and foster the growth of green agricultural ventures are. This research aims to propose a framework suggesting factors that play a significant role in flourishment of green enterprises, with a focus on developing countries. Through an extensive review and in-depth analysis of the existing literature in the fields of green entrepreneurship and agriculture, we propose a conceptual framework highlighting the internal and external factors that, when strategically aligned, foster the growth of green agricultural enterprises.

Keywords: green entrepreneurship; agriculture 4.0; environmental management; developing countries; small medium enterprises; SMEs; innovation

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1. Introduction

Together with the COVID-19 pandemic, climate change is one of the major issues the world is currently facing that causes serious environmental problems ranging from droughts and floods to extreme temperatures, consequently having large and negative effects on the global economy. These effects are even more evident when considering the agriculture sector, especially in developing countries [1]. Globally, the agriculture sector is regarded as a backbone of socio-economic growth and prosperity. According to World Bank data, in the year 2018, the agriculture sector contributed 4% of the world's gross domestic product (GDP) [2]. In some developing countries, the contribution of the agriculture sector to GDP is over 25%. At the EU level, the European Green Deal places great importance on the role of digitalization for ecological transition and sustainable growth. Accordingly, the European Commission asks member states to take advantage of the potential of the digitalization process based on new technologies in agriculture, aiming at improving the sustainability and competitiveness of the sector, while enhancing the conditions of farmers by simplifying their daily work. This is essential to achieve the objectives set by the current and future common agricultural policy (CAP) (https://www.fao.org/family-farming/detail/en/c/381469/) (accessed on 30 January 2022). As reported by International Trade Administration data, Italy is regarded as one of the largest producers of agriculture in the European Union region. The agriculture sector of Italy contributes 2% of the country's total GDP and provides employment to 4% of the total working population. According to the 2021 report of the Italian Smart AgriFood Observatory, in Italy the so-called *Agriculture 4.0* reached a value of EUR 540 million in 2020 (about 4% of the global market), registering a growth of 20% compared to the previous year. This type of agriculture is based on the prevalent use of data analytics systems, platforms, or processing software and the Internet of Things, and are applied in the phases of cultivation, sowing and harvesting of products in various sectors, including fruit and vegetables, wine,

and cereal. Similarly, in a developing country such as Pakistan, this industry sector ensures the country's food security, and is key to alleviating poverty and generating employment, particularly in rural areas. This sector alone contributes 19.2% to the country's GDP and provides direct and indirect employment opportunities to approximately 38.5% of the workforce [3]. In recent years, the growth of agriculture has been severely affected globally for obvious reasons like climatic change, water shortages, increases in prices of input, and, most importantly, the limited use of modern technology. Due to these issues, the agriculture growth rate over the last 5 years has fluctuated. In the last 5 financial years, the agriculture growth rate was on average about 2.5%, suggesting a limited agri-based entrepreneurial activity and innovation [3]. This statistical evidence calls for research and policy-making to foster the growth of this fundamental industry, especially for developing countries like Pakistan.

Agriculture is one of those industries that is contributing significantly to environmental degradation. Globally, the agriculture industry causes soil erosion, pollutes lakes, rivers, sea, and ground water, pollutes the top layer of earth through the excess amount of chemical in the form of fertilizer, and causes the extinction of living species [4]. Academic research suggests that one of the solutions to environmental degradation caused by the agriculture industry is promoting green agriculture enterprises and integrating agriculture with advanced sophisticated sustainable technology through green agriculture entrepreneurship. Green agriculture allows the achievement of established threshold sustainable criteria while advancing rural communities with regard to food, energy, and technological independence [5,6].

The importance of green entrepreneurship in environmental sustainability has widely been accepted by scholars and policy makers in both developed and developing nations [7]. In this research domain, Menon and Menon [8] suggest that large companies integrate ideas relative to environmentalism into their overall management and marketing practices to get a competitive advantage and exploit new market opportunities. According to OECD [9,10], small and medium enterprises (SMEs) play an essential role in green growth as the main drivers of green entrepreneurship and key players in emerging eco-friendly industries. More prominently, both directions given by the sustainable development (SD) goals set by the United Nations (UN) and the effects of economic restructuring after the COVID-19 pandemic have formed a new business landscape. A number of governments around the globe have also announced programs and plans that put green entrepreneurship at the top of their economic policy agenda [11,12]. New policies and strategies have been formed to promote green growth and facilitate advanced technological innovations that can mitigate the impact of humans on natural environment and address global climatic issues [13]. Therefore, identifying factors (both internal and external) that affect and/or influence green entrepreneurship in agriculture will inform policy to boost its growth.

The main objective of this paper is to identify and understand the factors that affect the growth of green agriculture SMEs. To this end, based on an in-depth analysis of different sources, we propose a conceptual framework suggesting that the internal and external factors, when aligned together, can foster the growth of green agriculture SMEs and thus, contribute to national economies and environmental sustainability. In this way, our proposed conceptual framework suggests the importance of the external and internal support system for innovative green firms and their role in national socio-economic development and environmental sustainability. This study aims to contribute to green entrepreneurship and agriculture literature by highlighting the importance of entrepreneurship in socio-economic development and environmental management in this specific field.

This paper is structured as follows. Section 2 offers a definition of green entrepreneurship based on the relevant academic literature analyzed. In Section 3, both the internal and external components involved in the growth of a green entrepreneurship ecosystem will be examined through the analysis of the extant literature on this topic, together with other information sources. Next, the conceptual framework informed by the examined

literature will be presented. Finally, a discussion and conclusion will be provided, together with future research avenues based on the limitations of the paper.

2. Literature Review

2.1. Green Entrepreneurship

Green entrepreneurship combines technological advancements with profit orientation to alleviate the environmental footprints of human activities on the natural environment, and to address environmental issues like degradation of soil [14], change in climate, and losses related to biodiversity [15]. A number of studies have reported that green entrepreneurship could be a driving force to restructure the economy for emerging economies [16]. However, there is disagreement among scholars on the concept and definition of green entrepreneurship. Academic literature offers a variety of terms and different meanings for the concept of green entrepreneurship, such as pro-environmental, green, sustainable, ecological, sustainable entrepreneurship, eco-preneurship, and eco-entrepreneurship. Normally, green entrepreneurship can be categorized into two categories: (1) in established firms where environmental management practices exist or where cleaner production processes are being adopted, and (2) newly established business startups focusing on ecology or natural resources [17]. The first category could be comprised of business entities focusing on adaptation of pro-environmental business practices to create innovations and to gain a competitive edge [18]. Prior academic studies conducted in green businesses domain suggest the effects of environmental management practices on competitive advantage in context of environmental management systems, and corporate social responsibility [19–21].

According to Menguc and Ozanne [22], green organizations acquire valuable intangible green resources that other companies cannot. In line with that, Menon and Menon [8] argued that large organizations align innovative environmental ideas with their organizational practices to place themselves in a better competitive position in the market. Based on green business management strategies, Pastakia [23] defined green entrepreneurship as an individual and institutional attempt to popularize their eco-friendly practices through market or non-market routes. Consistent with this argument, green entrepreneurship can be defined as the strategy through which an established business implements eco-friendly practices to differentiate its products, or innovates production processes through green practices to gain competitive advantage [17].

The second category of green entrepreneurship includes businesses organizations that use organic raw materials in the form of natural resources to develop products and services to prevent environmental pollution and degradation [17]. In a given context, Lober [24] defined green entrepreneurship as "the creation of new products, services or organisations to meet market opportunities" (p. 26) and argued that pollution prevention strategies used by organized businesses should be the motive for corporate self-renewal. Cohen and Winn [25] defined sustainable entrepreneurship as "the examination of how opportunities to bring into existence future goods and services are discovered, created, and exploited, by whom, and with what economic, psychological, social and environmental consequences" (p. 35). Consistent with this, green entrepreneurship can be defined as a new business startup focusing on the environmental services sector [17].

2.2. Green Entrepreneurship and Social Economic Prosperity

Entrepreneurship is a complex social phenomenon, with particular dynamics, approached from multiple perspectives, encompassing the processes behind the creation of ideas, companies, and patents [26–28]. It is regarded by various authors as a key component to the socio-economic development of a country as it enhances productivity, innovation, employment, and economic expansion [29,30]. The entrepreneurship research of the last 25 years is mainly polarized on two main aspects: the determinants that encourage entrepreneurial activity, studied especially in organizational, psychological, economic and

institutional domains, and the effects of new business creation, usually explored through institutional or economic frameworks [31].

Although no consensus is found among researchers on the definition of entrepreneurship, Medeiros et al. ([32], p. 3) reported that entrepreneur is "an individual who makes decisions under the conditions of uncertainty and emphasizes the distinction between risk and uncertainty". According to Global Entrepreneurship Monitor, entrepreneurship is regarded as an attempt to develop new business ventures or initiatives like self-employment, expansion of existing business, or new business enterprise [33]. Academic research has also suggested the importance of entrepreneurship in enhancing economic development and having an impact on the environmental performance of countries [11].

Recently, the issue of global warming and environmental degradation has emerged as one of the most severe crises humankind has ever faced [19,21,34]. As a result, policy makers across developed and developing countries are emphasizing strategies for mitigating the harmful impacts of business activities on the environment [19]. In response to these calls for environmentally sustainable business practices, scholars have introduced the concept of green entrepreneurship. The impacts of COVID-19 and globalization paved the way for economic restructuring and formed a new business landscape. In consequence, various Western governments have put green entrepreneurship on top of their agenda and announced initiatives to foster green entrepreneurship to develop new jobs and foster economic growth [35]. This importance of green entrepreneurship turned policy makers toward green entrepreneurship to stimulate growth through job creation, and toward environmental sustainability through promoting green products and services. As a result, over the last decade, policy makers around the globe, particularly in developing countries, have been making efforts to promote green entrepreneurship.

Apart from the impact of entrepreneurship on outcomes like economic growth and economic development, the social and environmental impact of entrepreneurship on society and particularly on marginalized communities and cultures where discriminatory practices exist cannot be ignored [36–38]. Entrepreneurship is regarded globally as a vital source of economic growth and a prominent factor influencing the socio-economic well-being of society [7,39]. Similarly, scholars considered entrepreneurship as an essential source of societal development, job creation, poverty alleviation, innovation, and economic competitiveness. It is argued by scholars that the role of entrepreneurship in economic development and empowerment of women is very important [39–41]. As the majority of the female population facing discrimination and empowerment-related issues are residing in rural areas where agriculture is the only source of income, engaging the female population in green agricultural entrepreneurship can thus be a source of women empowerment and the socio-economic development and well-being of under-privileged societies [33,36,42].

3. Green Agriculture Support Framework

The Green Agriculture Support Framework (GASF) is a comprehensive model suggesting how a green agriculture venture can be formed and how its organizational growth can flourish. The proposed GASF model not only suggests how to foster the growth of green agricultural enterprises, but this framework also supports the creation of an environment that supports green ventures in obtaining and sustaining a competitive advantage, and enables policy makers to achieve socio-economic and environmental goals by fostering green businesses. GASF describes a mechanism not only to achieve green objectives that are in compliance with the socio-economic objectives of firms, but are also designed to deliver the social, economic, and environmental goals of the entrepreneurial organizations at both macro and micro levels in a sustainable way. Namely, GASF helps to balance traditional organizational goals, like profit maximization, with environmental goals at the micro level and environmental sustainability at the macro level. By applying this scheme to the sector of interest, the value of GASF is its inherent structure designed to foster agriculture 4.0 through the flourishing of innovative agri-food businesses without compromising on environmental sustainability.

Figure 1 presents the outline of the proposed framework. The blue and orange arrows between the external and internal factors represent the inter-relations between the two dimensions and are based on the evidence from the literature analyzed in this paper. In the following section, all the building dimensions included in the figure and the relationships among them are described in detail through the triangulation of different sources (i.e., academic literature, institutional documents, and technical and economic reports), discussing also how the GASF will achieve the aforementioned objectives.

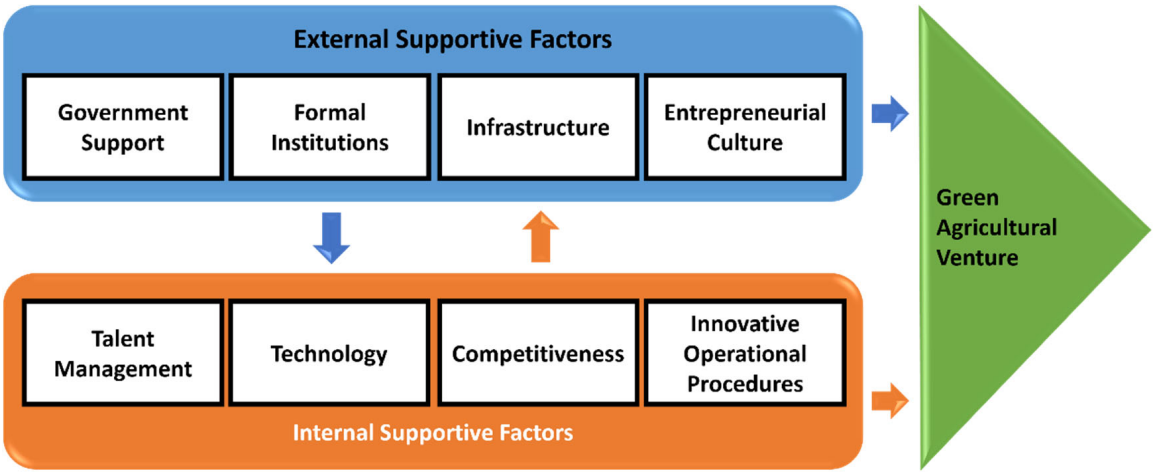

Figure 1. GASF framework.

3.1. External Support Factors

3.1.1. Government Support

The support from government and other related agencies is extremely important in promoting local industry, particularly small businesses. The rationale behind government policies is to make sure the efficient and effective working of market mechanisms through the elimination of market failures and administrative rigidities [43]. The purpose behind elimination of all rigidities is to create a context that allows organizations to assume reasonable tasks in their business operations [44]. Academic research emphasizes that governments possess most of the financial and non-financial resources and access to credit, which is much needed to start, grow, and expand a business venture [45]. In line with the importance of government in the generation, growth, and expansion of business ventures, governments around the globe are devising policies focused on fostering entrepreneurship among youth [46].

Keeping in view the importance of entrepreneurship in socio-economic development and poverty alleviation, the governments in developing countries have initiated various schemes to promote entrepreneurship among youth. With reference to the local context of Pakistan, the government has introduced various programs to foster entrepreneurship by providing interest-free loans, training, and skill development to youth. It is argued by scholars that the role of entrepreneurship in economic development is very important [40,41]. For instance, initiatives, such as Grameen Bank, provide evidence of the importance of entrepreneurship in poverty reduction [47] and enterprise generation. Banks like Grameen offer interest-free micro loans for starting small and micro businesses to private individuals, preferably females for different agricultural or business initiatives [48].

This suggests the importance of government support in the promotion of SME growth and poverty elimination and how much it matters in boosting the local economy. In line with these assertions and literature-based discussions, we believe that the support from government will play a decisive role in the generation and growth of green agriculture enterprises and an effective green agriculture entrepreneurship ecosystem for the growth of an actual green agriculture industry.

3.1.2. Formal Institutions

Every society needs a mechanism of formal institutions that design the rules of the game, ensuring functionality of all market forces in a fair and smooth manner. Hence, in a society, business rules are defined and determined by formal institutions [49]. In the entrepreneurship literature, the efficiency and quality (i.e., the level of perceived corruption and the general regulatory framework) of formal institutions matter a lot [50]. Fuentelsaz et al. [44] reported that formal institutions regulate the rules of the game, namely social, political, and economic relationships. These institutions reduce risks, provide human interaction, and deliver the order and structure for exchanges to take place. Not only do they influence the level of entrepreneurship, but also the characteristics and quality of entrepreneurship initiatives, by making them more or less productive [51,52].

According to Nobel Laurate Douglass North, "Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction" ([49], p. 3). The existence of institutions minimizes the uncertainties caused by social interaction through provision of a structure in which everyone is free to act. This function is of key importance as it enables the coordination of plans. Making it simpler, it can be said that individuals cannot socially interact in absence of knowledge and guidelines about actions and rules of the game in a social setting. If one does not know about the rules he/she has to follow, how can he/she engage in a social interaction? Keeping this in mind, one can easily understand that for institutions to minimize the uncertainty, they must be as stable and predictable as possible so that they can be used as guiding tools for social interaction [53].

The formal institutions that support green agricultural ventures can be categorized into financial, educational, and governmental systems [54]. According to Whitley [55], variations among societal institutions play a key role in forming economic behavior and suggest key environmental dimensions that influence entrepreneurial behavior, specifically related with entrepreneurs' choice in identifying the needed capital to start their ventures. The provision of financial services to aspiring entrepreneurs by formal financial institutions influences entrepreneurial thinking and contributes to the flourishing of entrepreneurial mindset and culture in the country. Common examples of these financial sources are represented by commercial banks, financial markets, and mutual funds [56,57]. Similarly, dynamic educational institutes play a key role in the provision of skilled human resources equipped with the competencies, skills, and advanced technology required to establish new business ventures, especially in developing countries and considering the digital transformation effects [54,58]. Academic research suggests new ventures depend heavily upon a supply of skilled human resources, and education institutes are the prime source of provision of this key resource [55]. Countries with well-established education systems produce entrepreneurs with the capability to face the hardships of starting a new venture through rigorous training. It is traditionally assumed in literature that higher levels of education lead to higher rates of entrepreneurship. Jiménez et al. [26], through their in-depth analysis, demonstrated how different educational levels can cause very different repercussions in relation to distinct forms of entrepreneurship. In more detail, the authors found that tertiary education increases formal entrepreneurship, namely the creation of new legally registered firms in a country, as a consequence of higher self-confidence, lower perceived risk, and enhanced human capital. Formal entrepreneurship mainly characterizes developed economies. At the same time, tertiary education was also found to have a negative effect on informal entrepreneurship, i.e., not legally registered and largely unregulated firms, as it increases awareness and sensitivity of the entrepreneurs about the possible negative repercussions of their business activities. The authors have also assessed the impact of secondary education, finding a positive effect on formal entrepreneurship, while a not significant one on informal entrepreneurship. Therefore, individuals' decisions to start business ventures are heavily influenced by the country's education system [59,60]. Likewise, the role of the state in formulating business-friendly environments and policies, maintaining law and order, and providing security is also essential in influencing entrepreneurial activity. In

the entrepreneurship literature, it is reported that the laws and regulatory structure of a country create hurdles and negatively affect the intentions of individuals considering entrepreneurship as their career. Similarly, corruption, a poor law-and-order situation, and unfair regulations also negatively affect entrepreneurial intentions [61,62]. In contrast, the relationship between new national-level business activities and the institutional environment, also known as the entrepreneurial framework conditions, is affected by opportunity perception and the perception of the presence of startup skills [54,59].

Another aspect to be taken into consideration in this context is the importance of relational, educational, psychological, and health-related variables that represent the antecedents of entrepreneurial intention and interest [63]. The study of Escolar-Llamazares et al. [64] analyzed these family-related variables in Spanish students, finding that those who expressed significantly high entrepreneurial interest were mostly men with a family tradition of entrepreneurial parents, with high perceptions of their health and quality of life, and who considered it important to detect opportunities in advance and to create employment. The positive effect of family systems on youth entrepreneurial interests is further emphasized by the recent study of Luis-Rico et al. [65]. Indeed, their evidence confirms the influence of family on the entrepreneurial ecosystem and the need to promote an entrepreneurial family culture.

Therefore, based on these arguments and cited literature, it can be concluded that to enhance growth of green agricultural enterprises, the existence of formal institutions that provide financial, technical, and regulatory support to aspiring entrepreneurs is very important and represents a prerequisite.

3.1.3. Physical Infrastructure

It is evident from academic research that infrastructure plays a decisive role in entrepreneurial regional development. For instance, the study of Audretsch et al. [66] reported that geographical regions having modern physical infrastructure facilities generate more entrepreneurial activity if compared to geographical regions with poor infrastructure facilities. Infrastructure involves the activities in developing a favorable environment suitable for business operations. Similarly, Sternberg [67] identified a number of elements including availability of physical, human, social, and knowledge capital that influence entrepreneurial activity in a region. A considerable amount of research has concluded that infrastructure plays an important role in generating economic activity and in generating opportunities for the growth and productivity of the enterprises [68–70]. Physical infrastructure enhances the cooperation and connectivity among people, which in turn benefits the entrepreneurial process [67]. Among the few studies available on the relationship between physical infrastructure and entrepreneurship, Woolley [71] suggests that infrastructure prompts entrepreneurial opportunities and activities and enhances the abilities of entrepreneurs to exploit opportunities by establishing their business ventures.

The study conducted by Ma et al. [72] in the context of high-speed railways in China provided empirical evidence for our argument. The development and modernization of the railway network shortened commuting time, enhanced travel efficiency, and improved the economic and personal communication between cities and regions. This improvement in the transportation infrastructure significantly impacted the flow of human and financial capital, technology, and other enterprise factors, and influenced both the birth of new businesses and the productivity of established enterprises.

3.1.4. Entrepreneurial Culture

Entrepreneurship literature regarded culture as a key element of an entrepreneurial ecosystem and a main attribute of its success and effectiveness [73]. In an entrepreneurial ecosystem, culture imparts a dynamism that helps to highlight the contribution of culture to the functioning of entrepreneurship through allowing capabilities to develop and enabling experiences and identities to be framed [74]. It is argued that even if all resources are available, and if rules, regulation, and other formalities are favorable, in a case that the

cultural element is missing from an entrepreneurial ecosystem, there is a possibility that the commitment may not continue, given that it will not be easy for the entrepreneur to "buy into" the procedure [27]. The absence of an entrepreneurship culture can prevent and void efforts to promote entrepreneurship, decrease the positive prospects of entrepreneurial activities, economic and financial outputs, and the creation of new startups [75]. In spite of the given importance of culture in entrepreneurship research, in entrepreneurial ecosystems, culture helps to understand and act as an effective mechanism for knowledge production.

Academics have recognized that entrepreneurial activities mostly take place in cultures that have low power distance, high masculinity, high individualism, and low uncertainty avoidance [76,77]. The entrepreneurial culture supports a positive social attitude toward entrepreneurial activity. Stronger entrepreneurial culture provides tolerance for facing failures, and enables the acceptance of the critical role of an entrepreneur in creating new jobs [78]. A strong entrepreneurial culture focusing on core competencies is very important to achieve sustainable growth because of its ability to employ an entrepreneurship strategy in an economic, social, and environmental context [79,80].

3.1.5. Economic Conditions

Favorable economic conditions are regarded as key to the success of any new business startup. In general, favorable economic conditions promote innovation and inspire young entrepreneurs to engage in entrepreneurial activity. A number of studies have suggested the link between favorable economic conditions and entrepreneurial activity [81], and the growth of new business startups [82].

It is evident from academic research that the effect of changing economic conditions on individuals' decisions to form a business ventures is arguable. The decision to start a venture is heavily determined by the utility of self-employment, as compared to outside paid employment. Unfavorable economic conditions have severe impacts on entrepreneurial activity, as unfavorable economic conditions negatively affect the returns from self-, as well as paid, employment. Higher and lower demand uncertainty decrease the expected level and increase the expected volatility of returns as self-employed. The expected returns must cover the initial cost of starting a firm, i.e., the cost of capital that is partially irreversible. Furthermore, it also must be noted that there are always chances of increases in the cost of capital during recession periods because of a decrease in bank lending [83].

In a similar vein, we found that income level has an impact on entrepreneurial activity [84,85]. Specifically, academic research illuminates that the increase in income significantly influences entrepreneurial activity [86]. Likewise, the findings of prior research conducted by Fishman and Sarria-Allende [87], and Parker and Robson [88] suggest the positive influence of income level on entrepreneurship. Favorable economic developments foster new firm creation because the financial prospects and expected benefits of starting a business venture are higher [89,90]. In addition, the income level and purchasing power determines the variety of consumer demand. A higher difference in demand supports the suppliers of new specialized products and reduces the economies-of-scale advantage of large existing firms [91,92]. This is the reason for which a higher economic growth rate will induce the existence of additional opportunities for aspiring entrepreneurs, which eventually leads toward new venture creation.

Thus, it is argued that in the presence of conducive and favorable business conditions, there are chances that aspiring entrepreneurs will venture into green agriculture businesses to exploit green business opportunities. Hence, favorable economic conditions can be counted as a major external economic factor that supports GASF.

3.2. Internal Support Activities

3.2.1. Talent Management

Human capital or talent is regarded as the backbone of any business venture particularly, and for productive entrepreneurship generally. For the success of any business organization, the attraction, recruitment, development, motivation, and retention of talent

are regarded as key contributors [93–97]. Research suggests Fortune 100 companies always strive to attract, recruit, motivate, develop, compensate, and retain talent because it is human capital that drives the performance and is key to gain competitive advantage [98,99]. Similarly, Bhattacharya et al. ([100], p. 37) stress that "increasingly, success comes from being able to attract, motivate, and retain a talented pool of workers with a finite number of extraordinary employees to go around, the competition for them is fierce".

According to Cohen [101], for success of entrepreneurial ventures, it is important that entrepreneurs should have access to skilled and qualified human capital, if they want to be successful and grow. A study conducted by Cohen [101] reported that 67 percent of surveyed entrepreneurs regarded the access to qualified human capital as of key importance for the success of their business ventures. For any region to become a hub of successful business startups, the potential to attract qualified skilled workers who seek excitement, challenge, and attractive compensation packages is the key [102]. Thus, in given assertions, the availability and access to qualify skilled human capital and effective talent management systems are critical factors.

3.2.2. Technology

Another way to promote green entrepreneurship as the engine of socio-economic growth is through the use of innovative and sustainable technologies. Academic research suggests a positive impact from information and communication technologies (ICT) on agricultural growth [103,104]. In this context, the adoption of digital technologies resulted in the literature as factors influencing the firm, either externally, in terms of competitive pressure and network influence, or internally, concerning technological skills and human capital [105]. Advanced technologies enable farm owners to expand their market shares by reaching new markets and customers through the internet and social media. Along with ICT, the role of agricultural engineering is also important in the support and growth of the agricultural industry. Research conducted by Truong [106] to study the use of technology by rice farmers in Vietnam reported a positive impact of advanced technology and equipment on rice production in the Mekong Delta region of Vietnam. The study of Truong [106] suggested some technologies that are beneficial for both farm owners, as well as for the agricultural industry as a whole. Those technologies, such as row seeding, integrated pest management (IPM), "three reductions-three gains", rice dryers, and harvesting machines, are reported to increase farm yields. Row seeding technology saves seeds, eases the process of crop handling, prevents pest attack, and is very easy to use. IPM technology reduces input cost (savings arise from reduction in seed and pesticide use), increases output, and protects the environment. "Three reductions-three gains" refers to a reduction in seed rate, pesticide, and fertilizer use to enhance yields and improve the quality of rice. A rice dryer is a technological advancement that farm owners use to reduce grain loss caused by sun-drying and labor costs associated with the post-harvest rice-drying process. Furthermore, a recent study by Savastano et al. [107] demonstrated through a cost-benefit analysis carried out in Southern Europe (Italy) how smart technologies apply to agriculture though 4.0 services (the so-called agriculture 4.0 or precision agriculture) that allow farmers and small agriculture firms to improve their sustainability in terms of increased economic efficiency, better informed decision-making processes, and a reduced ecological footprint. Indeed, precision agriculture technologies (PAT) can allow farmers to improve the efficiency of their farm management by reducing input use (e.g., water, fertilizers, etc.), reducing at the same time negative environmental externalities [108,109].

3.2.3. Competitiveness

Academic research suggests that in the current era, organizations in every business sector are facing huge competition, including green agriculture. To grow and survive, organizations are forced to increase production yield, use the most advanced technologies and services, seek business efficiency and competitive advantage, achieve large market shares, and retain talented minds in the organization. Smagurauskiene [110] emphasizes

that under such tensed business conditions, the managements of the organizations face problems of a decline in growth and there being no further investment resources. Investment is regarded as fresh blood in the veins of an organization and results in an extra competitive advantage. Consistent with these findings, governments around the globe promote business development in one or another form and pay great attention to small and medium businesses, as SMEs are regarded as crucial in the economic growth and stability of a country. Financial support is the key policy instrument of small and medium businesses. In line with this, it is argued that to survive and foster business growth, being competitive, as well as innovative, is necessary for a green agriculture startup. This competitiveness can be achieved through increasing production yields, discovering new markets, and using advanced technology and ICT equipment to increase efficiency and effectiveness.

3.2.4. Innovative Operational Procedures

Innovative operational procedures to enhance the effeteness and efficiency of business operations has been one of the widely investigated research topics in recent times. From these innovative operational procedures, organizations expect to enhance their overall business performance and to be competitive to compete with their rivals through catering to their customers in more innovative ways. Innovative operational procedures alter the traditional production processes of products and services being produced in the firm into procedures and processes that can be supported through information technology. The innovative operational procedures that a green agriculture enterprise needs to implement include, but are not limited to, the minimization of production processes through efficiency and effectiveness, improvement of business operational processes, use of technology in production and sales, automation of workflows, exchange of data with suppliers and customers, and use of electronic business transactions, i.e., use of credit and credit cards, kiosk machines, effective communication with customers through social media, etc.

These innovative operational procedures enable organizations to be cost effective and generate maximum output from minimum input. Through these innovative procedures, organizations enhance their business performance and serve their customers in a better way by offering them the best products and services effectively and efficiently.

4. Discussion

The present study is an initial attempt to explore and outline the external and internal environmental factors that contribute to the growth of green agriculture entrepreneurs and firms. In this way, our study contributes to the green entrepreneurship and agriculture literature in numerous ways. Previous studies identified that heterogeneous environmental conditions (e.g., policies, support programs, funding, culture, professional infrastructure, university support, labor market, R&D, and market dynamics) exist across regions or countries, and influence the creation of high-growth ventures within entrepreneurship ecosystems [111]. Hence, our study proposes a conceptual framework based on the review and analysis of relevant literature, highlighting the key internal and external factors that when aligned contribute to the growth of green agriculture enterprises at both the micro and macro levels. At the micro level, the proposed framework contributes by suggesting key internal factors (i.e., government support, formal institutions, physical infrastructure, culture, and economic conditions) and external ones (i.e., talent management, technology, competitiveness, and innovative operational procedures) that help a green agriculture venture to flourish and become competitive. Similarly, at the macro level, the proposed framework indicates the possible strategies policy makers may undertake as input to stimulate the growth of green agriculture enterprises, particularly in developing countries. In this way, the proposed conceptual framework suggests the importance of the external and internal support system for green agriculture startups and their role in the areas of national socio-economic development and environmental sustainability. The proposed GASF model also provides guidelines to current and aspiring entrepreneurs who want to

grow or expand their green agriculture business ventures by providing details of critical elements in internal and external support factors.

Our proposed framework also suggests the role of the necessary external factors for the flourishing of green agriculture enterprises, such as government support, formal institutions, physical infrastructure, entrepreneurial culture, and economic conditions, when interacting with the organization during the course of doing business. This is because of factors like government support and formal institutions that provide legislation and set rules of the game for market forces. These factors provide the mechanisms upon which the market operates. Similarly, they provide mechanisms for the funding required to grow and expand the operations of enterprises. Factors such as physical infrastructure ensure the smooth delivery of products and services to customers and clients in an effective and efficient manner. Entrepreneurial culture, on the other hand, is vital in developing entrepreneurial behavior and individuals' intentions to engage in entrepreneurial activity. Favorable economic conditions influence individual decisions to engage in entrepreneurial activity, facilitating and inspiring innovative entrepreneurial ventures [112].

Furthermore, our framework highlights the importance of internal factors that are in control of the organization such as talent management, technology usage, competitiveness, and innovative operational procedures in green agricultural SMEs' growth. Academic research illuminates the importance of talent management in the success of any organization as the success or failure of any business venture is hinged upon its human resources and their hard work [113]. If the right person for the right job is hired, provided with the required training and development opportunities, required to perform his/her task, and fairly compensated and appraised for his/her work, it is likely that the employee will feel satisfied and put his/her extra efforts to achieve organizational goals and the success of the organization. Similarly, the development or adoption of advanced technology and sophisticated equipment minimize the margin of error and ensure smooth business operations and procedures. The aforementioned internal factors and capabilities play a significant role in new venture success, which might be beneficial for owners and managers to achieve competitive position, especially in turbulent scenarios [114].

The GASF framework presented in this paper is an ideal platform for the incentive of green entrepreneurship, and particularly for agriculture-based business ventures. Green entrepreneurship is a critical element because of its flexibility, orientation toward innovation, propensity to take calculated risks, and resilience while facing challenges. It is a fact that innovations normally add value, but simultaneously they are also prone to the risk of failure, particularly when disruptive to traditional sectors such as the agriculture industry or in developing countries [115]. In order to create green innovations, entrepreneurs need to be flexible, persistent, and risk-taking. GASF needs a synergic blend of all the above entrepreneurial traits to be effective.

Hence, GASF is proposed as a basic conceptual framework to promote the growth of green agriculture enterprises without compromising the socio-economic or the environmental objectives of the venture. In this framework, both external and internal factors are aligned and influence each other in fostering the growth of green agriculture venture ecosystems. When all external and internal factors are strategically aligned together, green entrepreneurs will be enabled to develop core competencies to attain and sustain a competitive edge in the market. Organizational leadership plays a critical role in creating a green entrepreneurial culture in the organization that can promote core organizational values, ethics, and norms and generate significant environmental knowledge that eventually translates into intellectual capital for the organization, leading to a sustainable competitive advantage. Digital transformation through advanced technologies adoption and multiple-channels development will also help organizations to save costs and time, and to obtain a yield increase. All these factors can contribute to attaining a competitive advantage in the market as the firm will be able to enter new markets and increase the quality of its products and services. By implementing innovative business and operational procedures, green-agriculture-based entrepreneurial ventures can create value-added products and

increase their market shares while retaining their customers. In addition to this, using GASF, the green agriculture ventures can address the environmental concerns of the stakeholders with the support of both external and internal factors.

Therefore, by considering both the internal and external factors in a systemic manner, in addition to its theoretical contribution, this framework can be useful both for policy makers and practitioners for facilitating the actual origin and growth of green entrepreneurship ecosystems.

5. Conclusions

Our study proposes avenues for future research. This article highlights the importance of external and internal support factors described in the GASF that can foster the growth of green agriculture entrepreneurship. In this way, the current study contributes to academic literature in several ways. First, it contributes by understanding determinants and the features of green entrepreneurship. Second, it contributes by proposing a conceptual framework that highlights internal and external factors contributing to the growth of green agriculture SMEs. Finally, it contributes to green agriculture and entrepreneurship literature by studying the relationships among the factors that affect this scenario. The proposed internal support factors at the micro level (i.e., government support, formal institutions, physical infrastructure, culture, and economic conditions) and external factors (i.e., talent management, technology, competitiveness, and innovative operational procedures) at the macro level help a green agriculture venture flourish and become competitive. By describing these support factors, the proposed framework highlights the possible strategies policy makers may undertake as input to stimulate the growth of green agriculture enterprises, particularly in developing countries. In this way, the proposed conceptual framework suggests the importance of the external and internal support system for green agriculture startups and their role in the areas of national socio-economic development and environmental sustainability. Despite the evidence obtained and the extensive literature reviewed, there is still a lack of research on how green entrepreneurship contributes to economic development, particularly in lower- and middle-income countries. Thus, future research in this under-researched area may address this research gap. Still, it is unclear whether the proposed GASF model is also applicable to other green entrepreneurship domains. Future research may address this research gap by adapting this framework to other industry sectors or specific geographical regions to prove its actual effectiveness. To do so, future studies could analyze the building blocks of the GASF framework by testing them through panels of institutional experts and entrepreneurs, or large-sampled quantitative surveys. In addition, this framework could also be applied to other types of countries by considering additional factors in the model. For instance, it could be significant to investigate the role of demand, buyer's sophistication, pre-existing potential partners, clients, and suppliers with whom synergies can be created, comparing first-mover and other strategies of market entry.

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