RESEARCH ARTICLE

Knowledge and innovation management in agribusiness: A study in the Dominican Republic

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Abstract

To date and worldwide, most business activities in the agribusiness sectors have focused on increasing productive efficiency to the detriment of the environmental impact of these activities, despite close connection that exist between agribusinesses and natural resources. This paper argues that knowledge and innovation management (KIM) can play a key role in fostering and managing creativity in the agribusiness sector. To test this assumption, an empirical model linking KIM with employee creativity, responsible green innovation, and performance in the agribusiness sector of the Dominican Republic is proposed and tested with data from 110 agribusiness companies. We found that strengthening the relationships between the above constructs is needed, with a view to readjusting the meaning of firm performance in the light of emerging (post-pandemic) circumstances for agribusinesses. The statistical analyses yield important implications and recommendations for practice, management, and policy making in these areas in this country and elsewhere.

KEYWORDS
creativity, knowledge and innovation management (KIM), performance, responsible green innovation, sustainability

1 | INTRODUCTION

Currently, most business activities in the agribusiness sector around the world have focused on increasing productive efficiency to the potential detriment of the environmental impact of these activities, despite the close connection that exists between agribusinesses and natural resources. This paper argues that knowledge and innovation management (KIM) can play a key role in fostering and managing creativity in the agribusiness sector. Traditionally conceived of as the result of or later stages of individual or group creativity processes (Smith & Mannuci, 2017), innovation requires the nurturing of both individual and collective knowledge-based elements to flourish (Amabile et al., 1996; Csikszentmihalyi, 1996; Córdoba-Pachón, 2019; Sawyer, 2011; Tang et al., 2020). Together with knowledge, innovation can generate positive awareness about the complexity and ambiguity in organisations, potentially resulting in generating new behaviours that are shared through business networks to improve performance (Briones-Peñalver et al., 2020; Sung & Choi, 2012).

Worldwide, it has increasingly been argued that KIM can positively contribute to implementing sustainable development (SD) goals in businesses (Gloet & Samson, 2020; Hamdoun et al., 2018; Schulz

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et al., 2021). This is of relevance to agribusinesses, where according to Luhmann and Theuvsen (2017), knowledge can help address identified challenges and by doing so, help managers nurture creative behaviour that could benefit whole business relationships with their natural environments (Hadj, 2020; Jiang et al., 2020).

In the Latin American region, agribusinesses are currently one of the main contributors to economic development. They are considered a major source of the world's food supply (Ingenbleek & Dentoni, 2016; Salvini et al., 2018). To date, there are several regional studies that explore connections between knowledge, creativity and innovation as well as their impacts on the sustainability of businesses (Dai & Hwang, 2019; Martinez-Martinez et al., 2019; Shahzad et al., 2020). These highlight the impact of poor management and advocate the adoption of social, economic and environmental perspectives to redress existing imbalances (An & Alarcón, 2020; Gloet & Samson, 2020).

Latin American countries are experiencing the construction of common networks of production and services that make up a constantly growing native fabric. The different countries of the Caribbean region share a land border with a high strategic value of resources destined for agribusiness and have common factors associated with the poverty of their populations and progressive environmental degradation, which is much more serious in the Dominican Republic, which is a Caribbean island country (Raynolds, 2007).

Agribusiness can reduce poverty in the island country. They exchange goods, knowledge, technology transfer and information, resulting in participatory economic behaviour. What particularly happens in one Central American country has a long-term repercussion on the rest of the countries in the area, creating specificities and productive and commercial opportunities that result in innovation and knowledge that are of vital importance for the sustainable development of local communities (García-Granero et al., 2018, 2020).

This paper addresses these issues from the perspective of concepts like KIM, creativity and responsible green innovation. We explore how they are and could contribute to the sustainable performance of agribusinesses in the region and with specific reference to the Dominican Republic as a case study.

Creativity refers to knowledge that is acquired or exchanged between individuals (Cai et al., 2020; Rhee & Choi, 2017). Group creativity is an effect of individual synergies, requiring the combination of innovative knowledge, conflict resolution and the provision of appropriate skills (Dong et al., 2017). There could be an opportunity to explore in detail whether or how individual or group creativity could be fostered through KIM in the agribusiness sector, what systemic impacts derived from this could emerge, and how they could best be managed.

Therefore we assess the influence of KIM on employee creativity in order to contribute to existing debates on its role or roles in stimulating sustainable development (Abu Seman et al., 2019; Schulz et al., 2021; Stranieri et al., 2019). We formulate and test an empirical model with data from 110 companies in the agribusiness sector in the Dominican Republic. The data were obtained through 2020 and during the first wave of the coronavirus world pandemic. The coronavirus pandemic represents and shock to agroecological systems and an opportunity to better understand resilience (Sabin et al., 2022).

The model also includes the concept/construct of *responsible green innovation*. This can be defined as the integration and participation of the stakeholders' approach to the opportunities of new technologies, having a capacity to respond to possible risks, creating mechanisms of direct transparency with levels of accessibility to the results in research, focusing on environmental prevention that is built on the values of the working groups and environmentally responsible actions (Andereck, 2009; Bozeman et al., 2015; Galasso & Tombak, 2014; Hadj, 2020). In addition, this construct offers an integrative perspective to bridging capabilities between conventional business models and sustainable development goals (Imaz & Eizagirre, 2020).

We propose to analyse the strategic value of green innovation in the framework of the roles of agribusiness in productive enterprises in the Dominican Republic, being this country the most environmentally vulnerable to adopt techniques related to responsible green innovation and renewable energies as it is in the preliminary stages of development towards a sustainable transition, which may include from economic benefits to the preservation of natural and social resources natural and social resources (Fischhendler et al., 2016) in accordance with the objectives of sustainable development. Moreover, agribusinesses are able to mitigate climate change and act as social agents to protect natural ecosystems and rural livelihoods (Ureña Espaillat et al., 2022).

The responsible green dimension of innovation implies producing unique ecological products or processes (Fang et al., 2019; Song & Yu, 2018), and if properly managed, can also bring forth radical innovations that improve firm performance (Briones Peñalver et al., 2018; Tuin et al., 2020; Zhang et al., 2020). We aim to further extend the current research on the effects of creativity, responsible green innovation and performance (Teodoridis et al., 2019) to reconsider their future implications for research, policy-making and practice.

The paper is organised as follows. First, we present a brief overview of the Dominican Republic agribusiness sector as the research context for our study. In our review of extant literature, we formulate a number of hypotheses concerning relationships between KIM, creativity, responsible green innovation and firm performance. These are proposed in an empirical model. We use structural equation modelling (SEM) to test our hypotheses by assessing the strength of their relationships according to the data obtained from 110 agribusinesses in the Dominican Republic. Implications and conclusions are elicited from the presentation and discussion of results.

2 | RESEARCH CONTEXT

The Dominican Republic is a country in the process of development in which agribusiness represents 8% of GDP above those of the Caribbean region, which creates a differentiating and powerful element with profound implications for the country's economy. This country is emerging in the construction of new models that are creating strategic alliances between different economic and social sectors, providing an integrated and inclusive development of agribusiness in the country (Ureña Espaillat et al., 2022).

As a country, the Dominican Republic presents unbeatable conditions for the promotion of an agro-industrial with highly competitive

power at a global level. Agribusinesses are backing the construction of business activities, contributing to the promotion of retention and value addition in rural areas. The availability of sustainable food value chains helps the country meet a number of Sustainable Development Goals (SDGs) by creating peasant economy units and clusters that contribute to strengthen the rural fabric. These clusters are conformed by creative companies that consider the most innovative, ethically responsible and sustainable versions of new technologies, creating a fast-growing potential market.

Agricultural production plays a major role in the consolidation of economic growth in developing countries, and the Dominican Republic is no exception. According to the report of the Central Bank in the first quarter of 2020 and prior to the economic effects of the pandemic on the real economy, agriculture and livestock in a consolidated manner represented about 8% of GDP, generating 14% of jobs, and yielding 80% of food for local consumption and 25% of exports. Anecdotal data currently corroborate an increase in the subsector because of the direct effects of the pandemic and a trend in the strengthening of primary activities in the economy.

The sustainability of the agricultural value chain in developing countries requires further research to take into account the innate complexity of local supply chains, the uncertainty of value added by intermediaries, the lack of efficient aggregation of partnerships and the presence of barriers to direct access to the chain and consumer perceptions of food from developing countries (Gómez-Luciano et al., 2019). The management structures of agricultural companies in the Dominican Republic carry out responsible actions that have an impact on sustainable rural development, integrating all their strategic resources and absorbing knowledge from farming systems and grassroots organisations that incrementally strengthen innovation processes in agribusinesses with a high orientation towards creativity and employee knowledge.

In this paper, we are to investigate how the sector can continue growing with the nurturing of knowledge and innovation management, creativity and responsible (green) innovation, and what lessons can be learned for agribusinesses elsewhere.

3 | THEORETICAL FRAMEWORK

3.1 | Knowledge and innovation management or KIM

To date, a great number of empirical studies on knowledge and innovation management conceive it as a systemic structuring of social networks and their underlying processes or technologies to improve the transfer, invention and spreading of knowledge (Gloet & Samson, 2020; Press & Córdoba-Pachón, 2009). Early and extant literature on creativity and innovation suggests the importance of integrating knowledge through human relationships between individual creators (Amabile et al., 1996; Csikszentmihalyi, 1996; Sawyer, 2011), implying that there could be a natural boundary between the (individual) production and (group) application of new ideas, which is often expressed as a difference between creativity and innovation (Smith & Mannuci, 2017).

It is said that a creative product or service developed to respond to identified problems could emerge from multiple configurations among individual or group based exploratory actions (Córdoba-Pachón, 2019; Csikszentmihalyi, 1996; Schulz et al., 2021). Cegarra-Navarro et al. (2017) argue that the exploration of knowledge is the result of previous rediscoveries which contribute to social dynamics as well as the creation of individual and collective capabilities. It becomes important to help organisations develop and nurture appropriate conditions for the exploration, acquisition and renewal of knowledge, and to do this while keeping specific organisational circumstances and factors (i.e. culture) in mind. This should be carried out by continuously reviewing and aligning people's skills and motivations to the problems or challenges presented (Amabile, 1997).

3.2 | Employee creativity

Castro-González et al. (2019) define employee creativity as a type of individual conduct derived from the characteristic constellations, cognitive skills, social environments and processes that exist in the working environment, which could also become a critical source of organisational competitiveness (Cai et al., 2019; Ding et al., 2019; Soda et al., 2019). Hirst et al. (2009) consider that creativity is not an unbound or unconstrained process that could only be restricted by organisational practices or goals but often involves the search for solutions to new or undiscovered problems for its own sake (Csikszentmihalyi, 1996).

According to Gibbs et al. (2017) and Glavenau and Beghetto (2020), individual creativity can manifest itself via a continuum of activities through which employees use their experience to generate *novel and valuable* solutions to challenges or problems. Creative ideas could be integrated into formal systems to encourage process and product improvements at any organisational level, business activity or practice (Dul & Ceylan, 2011; Glavenau & Beghetto, 2020; Indriartiningtias et al., 2019). Organisations thus need to develop structures and practices to both stimulate and use creative habits and practices (Cai et al., 2020).

3.3 | Responsible green innovation

Responsible green innovation refers to transparent and interactive processes in organisations that allow for the proper integration of scientific knowledge and technological advances to meet sustainable development goals (Schulz et al., 2021; Stilgoe et al., 2013). Awan et al. (2020) posit that responsible green innovation is an organisational capacity that encourages creative approaches to problems related to ecological products and services to be discovered and transferred, strengthening group relationships and generating a green identity in organisations (Li et al., 2020).

However, Munro (2020) argues that responsible green innovation can often be seen by managers as a secondary or subsidiary effort to strengthen the achievement of environmental impact mitigations of

core business processes. It is thus important to identify organisational factors that could enable or hinder responsible green innovation (Huo et al., 2020). In practice, its effective implementation involves inclusion, anticipation and sensitivity to human and environmental aspects (Stilgoe et al., 2013). As with employee creativity, organisational capacities or practices need to integrate green responsible innovation so that they can meet environmental protection requirements or standards (Song & Yu, 2018). Although an initial focus could be saving time, improving efficiency, resources and capital (Zhang et al., 2020), subsequent developments or maturation could also address broader social, ethical and environmental issues (Imaz & Eizagirre, 2020).

4 | RESEARCH HYPOTHESES

Having considered the generic features of the above constructs, in this section, we propose a number of hypotheses to relate them and build an empirical model.

4.1 | KIM and employee creativity

Chen and Rice (2020) state that knowledge is a primary good associated with a set of factors that encourage widespread reciprocity and allow information to be combined to produce new solutions. In recent creativity studies, the quality of an idea is evaluated by standards such as relevance, novelty, specificity and feasibility (Glavenau & Beghetto, 2020; Zhu et al., 2019). Employees continuously develop refinement processes, checking the inconsistencies of what they know and making improvements that could positively affect their work and well-being (Córdoba-Pachón, 2019). In addition, knowledge microsystems foster the fruitful gestation of ideas that constitute an intensive creative work dynamic (Calic et al., 2020).

Sung and Choi (2012) establish that knowledge content provides raw materials or ideas to generate new knowledge, while processes allow teams to apply the most relevant aspects of this knowledge and thus activate its value. Employees need to develop their creative potential through access to diverse knowledge bases and capabilities, producing new combinations (Teodoridis et al., 2019). Brennecke and Stoemmer (2018) focus on the fact that in modern organisations, neither groups nor individuals possess all the relevant elements and resources necessary to succeed. According to Wijngaarden et al. (2020), employees can strengthen their individual creativity as they develop a variety of best practices, which potentially increases their competitiveness as well as their skills and motivation. Improving team creativity requires promoting communication and information exchange to obtain the new ideas that meet the challenges they face (Dong et al., 2017), creating positive spill-over and value creation in organisations (Ivcevic et al., 2020).

KIM could help develop creativity competences in employees while also enhancing group and organisational capabilities. Nonaka (1995) posits that there is an upward spiral including socialisation, externalisation, combination and internalisation in the creation of knowledge among an organisation's members. There is also evidence of links between structurally driven configurations of knowledge and individual creativity (Soda et al., 2019). Knowledge input is therefore important to stimulate individual and group creativity (Indriartiningtias et al., 2019). Such types of creativity can also originate from and within diverse processes in management including acquisition, retention, sharing and application (Akram et al., 2018). Employees develop specific knowledge conversion through different (re)combinations and acquisition processes (Jiang et al., 2018; Zhang et al., 2020), many of which are implemented in appropriately motivated groups or teams (Pan et al., 2020; Rodríguez-Sánchez et al., 2017).

It follows that strengthening the competencies necessary for successful creativity can be achieved through nurturing group or organisational KIM capabilities (Jiang et al., 2020; Rasool et al., 2019). We therefore propose the following hypothesis:

> **H1.** KIM has a positive influence on individual and collective employee creativity in agribusiness.

4.2 | KIM and responsible green innovation

Academic literature on knowledge management establishes a relationship between innovation and knowledge in an attempt to satisfy the most central commercial needs and guarantee business survival (Briones-Peñalver et al., 2020; Quan et al., 2020). It is said that companies must capitalise on and monitor their internal capabilities to ensure adequate knowledge exchange (Hadj, 2020). Effective management of knowledge flows and knowledge systems across departments can make available a variety of knowledge which could help businesses become more environmentally sustainable and responsible while contributing to foster green innovation (Awan et al., 2020; Ogbeibu et al., 2020; Rasool et al., 2019; Reijers, 2020).

In economic sectors like agribusiness, agribusinesses have a high level of technological systems and tools that build information that strengthen intelligence in agricultural markets. It can therefore be safely assumed that they could already have developed relatively advanced structures for the creation and transfer of knowledge, often thanks to government stimulus programmes or policies. Agribusiness managers however need to create and nurture the social fabric of rural life to help preserve ecosystems in the face of climate change and other uncertainties (Ingenbleek & Dentoni, 2016). In this regard, Ogbeibu et al. (2020) highlight the importance of continuously promoting group work and team efforts to strengthen responsible green innovation. This implies the combination of existing and new knowledge (Jiang et al., 2018, 2020) as stated earlier. Responsible green innovation should therefore promote the integration of several functional dimensions of R&D, finance and technology (manufacturing and/or marketing) for it to be effectively implemented (Chen et al., 2019; Glińska-Neweś & Karwacki, 2018; Schartinger et al., 2020; Tseng et al., 2013). Such integration also requires the involvement of different stakeholder groups to help businesses develop capabilities to anticipate and act on contingencies or risks

(i.e. the world coronavirus pandemic) (Hadj, 2020; Stilgoe et al., 2013). Therefore, the following hypothesis can be formulated:

> **H2.** KIM positively influences responsible green innovation in agribusiness.

4.3 | Employee creativity and performance

Previous research on creativity has shown that motivation (internal, external to individuals) is a vital aspect in work contexts and creative performance (Amabile, 1997; Amabile et al., 1996; Hur et al., 2018). Liu (2016) states that employee creativity can be a determining factor in improving performance because it facilitates the creation and adopting of useful working methods. If existing, creative processes of the employees in agribusinesses are often oriented towards the construction in terms of land management, to diversify production mechanisms or to align these with the vision(s) and expectations of owners. Martinaityte et al. (2019) and Yang et al. (2016) have found that in this sector, creative capacity has a positive influence on business results and performance.

> **H3.** Employee creativity positively influences performance in agribusiness.

4.4 | Responsible green innovation and performance

Along the same line as before, some researchers have found that responsible green innovation positively affects responsible and organisational performance (Khurshid et al., 2019). For instance, Singh et al. (2020) find that performance relies on developing quality environmentally friendly products. Briones Peñalver et al. (2018) find a direct relationship between innovation in agribusiness and economic performance in the context of responsible policies in the region of Central America (Nicaragua).

In agribusinesses, responsible green innovation could be nourished by making available market information as well as by the identification of employees' knowledge about their natural environment. This could then help in the integration of creativity in business strategies in ways that respond to employees' ethical sensitivity towards sustainability goals. The following hypothesis can therefore be formulated:

> **H4.** Responsible green innovation influences performance.

4.5 | The relationship between KIM and performance

Previous studies have related KIM to performance in different environments, organisational climates and business sectors

(Akram et al., 2018; Zhou & Verburg, 2020). Organisations that offer their target markets cutting-edge products generated from new knowledge can attract new customers, improve overall performance and achieve sustainable competitive advantages (Rasool et al., 2019). In the achievement of medium- and long-term objectives, performance *can also* include any non-financial competencies, including reliability, flexibility, quality and agility (Lynch & West, 2017). A harmonious combination of organisational factors that contribute to knowledge creation and management improves performance (Wooten & Ulrich, 2017).

> **H5.** Knowledge innovation has a positive influence on performance.

5 | METHODOLOGY

Figure 1 summarises the theoretical model of this paper. The initial statistical population of our study was 323 agricultural enterprises representing different strategic agribusiness groups in the Dominican Republic. To arrive at this population, we used the information from different clusters as interrelated organisations in the sector. We took into account their resources and business capacities, the levels of turnover, the use of information technologies and human resource management. Two members per company were interviewed, both top management and middle management. The interview was conducted electronically. Previously, a pilot test was carried out to check the contents, with a 98% effectiveness rate, respectively.

A survey was developed after reviewing the previously mentioned literature. A questionnaire was designed and piloted to include several sections: knowledge and innovation management (KIM), employee creativity, responsible green innovation and firm performance. The questions were designed using a five-point Likert scale (i.e. 1 = *strongly disagree* and 5 = *strongly agree*). The questionnaire was given face-to-face as well as online to agribusiness owners or general managers. Out of the initial population of 323 companies, 110 of them fully and adequately answered and returned the questions of our survey.

To analyse questionnaire responses, SEM was used to investigate the conceptual relationship modelling and to explain the associations between variables. Used Software was Smart PLS 3.2.9. SEM is a statistical procedure that permits the measurements of functional, predictive and causal hypotheses to be verified. A SEM actually consists of a measurement model and a structural model (Hair et al., 2019). PLS-SEM is presented as being a desirable multivariate data analysis method because of its remarkable ability to achieve acceptable power at very small sample sizes (Kock & Hadaya, 2018).

Regarding interrelations and strategic collaboration through clusters, 53.6% of agricultural enterprises do not belong and 46.4% belong. In terms of company size, 26.36% correspond to micro-companies with fewer than 10 employees, 51.81% to small and medium-sized enterprises and the remaining 21.81% to the
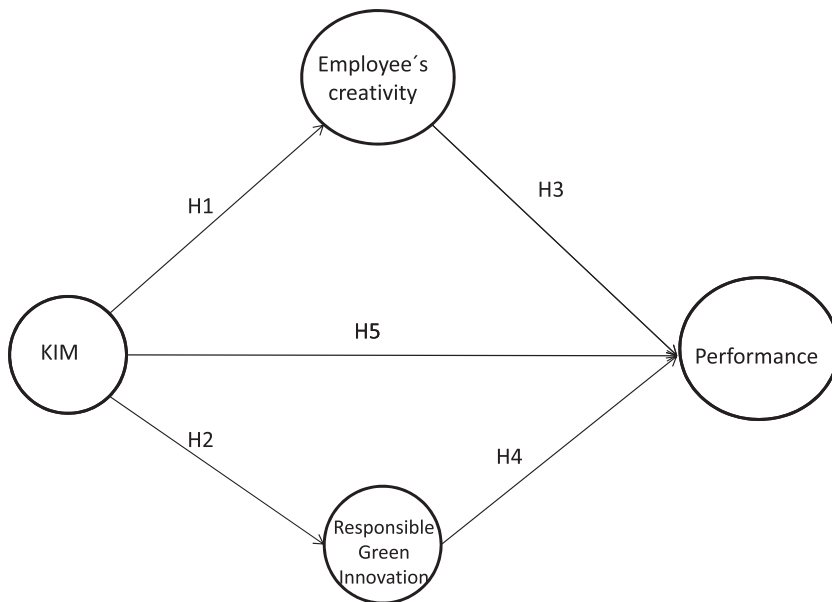
FIGURE 1 Theoretical model

agro-industrial sector with more than 250 employees. Regarding employee characteristics, 74% of the employees are men and 36% are women. Of the different age ranges, 16% are under 25 years old, 35% are between 25 and 35 years old, 32% are between 36 and 50 years old, and 17% are over 50 years old. In terms of employee educational levels, 40% have reached primary level, 19% secondary level, 35% have a bachelor's degree, and 5% have a specialty or master's degree. As for the employees' contracts, 74% are permanent, 26% are temporary.

6 | RESULTS OF THE EMPIRICAL MODEL

6.1 | Evaluation of the measurement model

Following Hair et al. (2019) for the reflective indicators, the loads (λ), Cronbach's α and ρ_A, ρ_c for internal consistency, the AVE for convergent validity and the HTMT (heterotrait–monotrait ratio of correlations) for discriminate validity are considered. As can be seen in Table 1, all the internal characteristics are fulfilled. Moreover, a factor has discriminant validity when its HTMT ratio of correlations is less than 0.85. In our case all HTMT are lower than 0.85, as shown in Table 2. Hence, all the criteria for validity are met.

6.2 | Evaluation of the structural model

Once the validity of the measurement model has been established, the structural model is analysed. In Figure 2, the β (path coefficients) and R^2 can be seen. If βis greater than 0.2, the hypothesis is accepted (see Table 3). In addition, the VIF values of the structural model are below 3, so there is noncollinearity in the constructs (Hair et al., 2019). The VIF values are shown in Table 2.

6.3 | Goodness of fit

Currently, the SRMR (standardised root mean square residual) is accepted as an approximate measure of the overall fit of the model, whose value should be less than 0.10. Although there are no threshold values, the lower d_{ULS} and d_G are better for the model. These values must be within the confidence interval obtained at 95% or at least at 99%. If values do not exceed these ranges, it is very likely that the model is true (Hair et al., 2019). As can be seen in Table 4, we have a good fit of the model as the conditions are met.

6.4 | Total effects

The effects of KIM on performance range from 0.256 to 0.406 (see Table 5). Therefore, it is worth analysing the possible effect of mediation that could be exerted by the constructs of Employee Creativity and Responsible Green Innovation. These effects, when analysed in depth, were not considered to be significant. Therefore, we cannot fully state that complementary statistical mediation is taking place. Further research is needed (to be mentioned later) in this regard.

7 | DISCUSSION OF RESULTS

Only three of the five hypotheses (H1, H2 and H5) are confirmed (see Table 3), meaning that the positive presence of knowledge and innovation management in agribusinesses contributes to nurturing and fostering both employees' individual and collective creativity as well as responsible green innovation. These in turn add to enhancing firm performance.

These findings are consistent with existing literature (Chen et al., 2019; Gloet & Samson, 2020; Tang et al., 2020). In the agribusiness
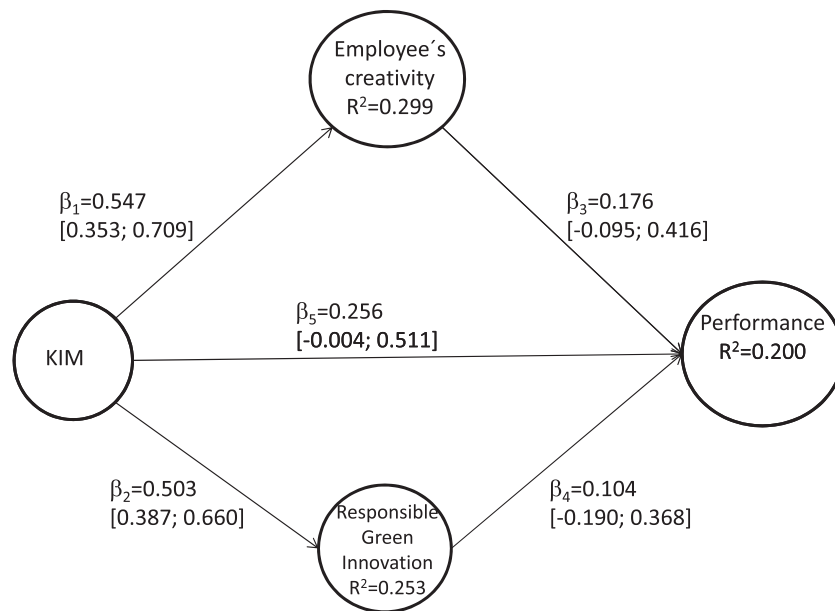
TABLE 1 Indicators, loadings (λ) and measurement model assessment

Literature background	Indicators	Description	λ	Confidence intervals 2.5%	97.5%	Measurement model assessment Cronbach's α	ρA	ρc	AVE
(Akram et al., 2018; Jiang et al., 2020; Quan et al., 2020; Rasool et al., 2019; Rhee & Choi, 2017; Soda et al., 2019)	**KIM**					.726	0.751	0.828	0.547
	KM.1	Combining external and internal knowledge is encouraged to generate new ideas	0.719	0.555	0.820				
	KM.2	I received knowledge from colleagues in my department	0.653	0.453	0.777				
	KM.3	Colleagues in my own department have used knowledge provided by me	0.763	0.634	0.846				
	KM.4	Has processes for using knowledge to develop products or services	0.815	0.734	0.871				
(Yang et al., 2016; Indriartiningtias et al., 2019; Rodríguez-Sánchez et al., 2017; Soda et al., 2019; Pan et al., 2020)	**Employee Creativity**					.852	0.870	0.885	0.525
	CE.5	I experiment with new approaches in my work.	0.673	0.455	0.786				
	CE.6	I am the first to get involved in the development of new trends.	0.663	0.396	0.798				
	CE.7	At work I am inventive in overcoming barriers.	0.789	0.659	0.859				
	CE.8	I come up with new ideas to improve departmental performance.	0.762	0.648	0.843				
	CE.9	I suggest new ways to optimise processes and routines.	0.674	0.480	0.788				
	CE.10	There is a good mix of skills in my work team	0.728	0.562	0.827				
	CE.11	I come up with creative solutions to emerging problems	0.772	0.689	0.840				
(Chen et al., 2013; Hadj, 2020; Ogbeibu et al., 2020; Singh et al., 2020; Shahzad et al., 2020)	**Responsible green innovation**					.748	0.788	0.836	0.561
	IVR.12	The company involves different stakeholders in research and development processes on environmental issues.	0.812	0.709	0.902				
	IVR.13	Changes and innovation processes are taken into account in advance to meet present and future environmental challenges.	0.748	0.567	0.851				
	IVR.14	It is able to identify potential risks affecting natural resources and react accordingly.	0.705	0.408	0.829				
	IVR.15	Environmental groups are promoted in companies that foster new green ideas	0.727	0.487	0.841				
(Briones Peñalver et al., 2018; Briones-Peñalver et al., 2020; Zhou & Verburg, 2020)	**Performance**					.687	0.731	0.805	0.514
	R.16	Increase in productivity	0.779	0.552	0.865				
	R.17	Increased profitability for business owners	0.737	0.440	0.863				
	R.18	Access to new markets	0.796	0.660	0.880				

Source: Authors.

TABLE 2   Discriminant validity and collinearity assessment

	Employee creativity	Responsible green innovation	Performance	KIM
HTMT values				
Employee creativity				
Responsible green innovation	0.510			
Performance	0.428	0.404		
KIM	0.654	0.641	0.514	
VIF values for structural model				
Employee creativity			1.476	
Responsible green innovation			1.385	
Performance				
KIM	1.000	1.000	1.648	

FIGURE 2   Results of the empirical model

TABLE 3   Hypotheses testing

Relationships		β	t-values	Confidence intervals 2.5%	97.5%	Accepted
H1	KIM -> Employee creativity	.547	6.125	0.365	0.709	Yes
H2	KIM -> Responsible green innovation	.503	7.200	0.386	0.654	Yes
H3	Employee creativity -> Performance	.176	1.341	−0.099	0.415	No
H4	Responsible green innovation -> Performance	.107	0.756	−0.181	0.365	No
H5	KIM -> Performance	.256	1.922	−0.013	0.507	Yes

TABLE 4   Goodness of fit of the model

	Measurement model			Structural model		
		Confidence intervals			Confidence intervals	
	Mean value	95%	99%	Mean value	95%	99%
SRMR	0.091	0.085	0.092	0.095	0.090	0.098
dULS	1.561	1.367	1.625	1.697	1.525	1.811
dG	0.492	0.516	0.593	0.498	0.519	0.598

TABLE 5 Total effects

	β	t-values	p-values	Confidence intervals 2.5%	97.5%
Employee creativity -> Performance	.176	1.341	.180	−0.099	0.415
Responsible green innovation -> Performance	.107	0.756	.450	−0.181	0.365
KIM -> Employee creativity	.547	6.125	.000	0.365	0.709
KIM -> Responsible green innovation	.503	7.200	.000	0.386	0.654
KIM -> Performance	.406	4.528	.000	0.222	0.562

sector, there are noticeable organisational processes that could lead to patterns of collective learning, knowledge transfer, and explicit and implicit exchanges of knowledge (Neumeier, 2017). Additionally, creativity management plays a more crucial role in realising the actual outcomes.

Our model offers solutions to specific problems of agribusiness in the Dominican Republic and that respond to a differentiated reality, whose essential nature is to benefit groups of vulnerable individuals working in agribusiness for the improvement of education levels and the strengthening of professional development in agribusiness, which are in line with the recommendations of the different member states of the SDGs directed towards youth and adult policies that contemplate principles of social sustainability such as inclusion, equal opportunities and so forth. All of this with the aim of promoting changes in the labour market, through knowledge management and innovation, in an international context of digital transition. Moreover, in the context of a pandemic like the one we have experienced (with socio-economic damage and economic dislocation), in order to achieve greater competitiveness of agribusiness our first hypothesis confirmed a positive relationship between KIM and employee creativity, which resonates with the findings of the study by Teodoridis et al. (2019). As mentioned earlier in this paper, these and other authors advocate the development of a set of knowledge re-combinations or reconfigurations which could positively lead to enhance creativity within organisations. In the model used in our study, employee creativity is a construct built of individual, group and cohesive aspects which can be fostered by nurturing motivation at work (Hur et al., 2018). The construct differs from some aspects of work knowledge dimensions in the study by Zhou and George (2003). By motivating employees to share and explore together, as well as identify and exploit or use it, it could be argued that any potentially exclusionary dynamics in relation to content and processes-based activities of knowledge management is corrected (Sung & Choi, 2012).

This would lead to a series of common factors that enrich the methodology applied in this research work following the recommendations of positive change and strengthen social innovations to reduce poverty such as the conservation of sustainable rural habitats, responsible investments, community development and microfinance of agribusiness farms in the Dominican Republic (Schartinger et al., 2020).

Moreover, current research on KIM shows that information and knowledge produce positive stimuli in employees that lead to collaborative networks that enrich organisational creativity from a human resources perspective (Amin et al., 2020; Moirano et al., 2020; Soda et al., 2019). This, in turn, could contribute to harmonising individual-group relationships, leading to better creative results.

The study by Soda et al. (2019) assesses the direct effects of knowledge acquisition and provision and individual creativity from building a collaborative context and networks that foster social capital. In our study, we interrelate these variables and link them to aspects of the knowledge creation process through the combinations that emerge (Jiang et al., 2020) and result in beneficial employee creativity and responsible green innovation practices. These agribusinesses develop a close collaborative relationship with their stakeholders, strengthening a mutual pro-environmental vision, territorial value and developing actions that benefit the rural sustainability of communities. In our study, we focused on identifying knowledge management processes related to the acquisition, retention, sharing and application of knowledge (Akram et al., 2018).

Our findings suggest that there is appropriate coordination between the creative functions of employees and their involvement in promoting responsible green innovation. This duality could also contribute to generating new ideas and proposals which could enhance KIM capabilities in the organisations studied, as well as positively contribute to their performance in the short and long term. As we see it, this finding could enhance employees' contributions from different organisational areas, in particular the resolution of problems related to agricultural production, marketing, and internal management of the value chain in agribusinesses. Appropriate co-ordination could also help these businesses nurture their dynamic capabilities in environment-related issues because they could develop effective routines to identify and develop new green areas of knowledge, learning, generating, or combining their application via different resources. This relates to H1 and H2.

Therefore, it can also be submitted that the appropriate integration of knowledge, creativity and innovation can improve the understanding of the socio-environmental systems and practices developed by agribusinesses towards their meeting of sustainable development goals. Currently, agribusinesses in the Dominican Republic are in the process of an accelerated transformation to digitalization from the prism or framework of dynamic capabilities in response to the volatility of changes in the various business environments. And such integration could also help them effectively use synergies and gradually reduce the environmental impact of their activities, which could lead

to better business results in the medium and long term (Akram et al., 2018; Mitter et al., 2019; Shah et al., 2020).

Worldwide, the scientific literature establishes differentiated relationships between knowledge, creativity, innovation and improved sustainability (Dai & Hwang, 2019; Martinez-Martinez et al., 2019; Ogbeibu et al., 2020; Poldner et al., 2017; Shahzad et al., 2020). In our study, H2 established a positive and strong relationship between KIM and responsible green innovation. Our initial literature review highlighted that knowledge management can stimulate responsible actions in companies (Jiang et al., 2020). Responsible green innovation could also permit organisations to better align their processes and results to the values, needs and expectations of society (Imaz & Eizagirre, 2020).

Overall, our results suggest that the combination of KIM with creativity and innovation in agribusinesses contributes to strengthen their sustainability and that of their natural environments. This research integrates current literature on the dynamics of knowledge in organisation with employees' creativity and could inform future developments to look in more detail at agricultural knowledge and expertise in different country contexts. Examining the mediation of KIM on performance is also a novel contribution. There is prior evidence that KIM greatly contributes to protecting organisations' reputations, highlighting their commitments to sustainability, quality and innovation (Gloet & Samson, 2020). This facilitates a positive transformation in agricultural enterprises.

For the agribusiness sector in general, our findings point to the fact that organisations operate as centralised entities that are highly dependent on issues related to caring for and protecting the environment. The implementation of responsible innovation programs or activities could also make it possible to promote creative behaviour in employees, and from there to groups or teams. In line with the results by Ogbeibu et al. (2020) which emphasise the role of creative groups oriented to green issues, the integration of responsible green innovation practices in agribusinesses could be seen as catalyst for positive change, even in terms of business performance.

Our findings also support the idea of managing creative processes and talent to generate sustainable organisational performance, which is more outstanding in the achievement of operational and strategic objectives (Al Aina & Atan, 2020). There is a degree of partnership between different stakeholders related to environmentally sensitive issues, which strengthens or extends the social relationship that fosters creative processes and reconfigures new organisational structures with environmentally ethical and transparent values. The mediation that both factors exert through the KIM enhances this relationship in a positive way because there is a creative dynamic of sustained creation based on integration and common objectives. The creative solutions emanating from employees and responsible green innovation could directly affect the performance and results of agricultural companies. For example, these processes could generate a chain of factors based on environmental purposes and values rather than simply profit, and potentially resulting in agribusinesses limiting their yield or managing it more creatively for the benefit of the land and other resources that they use.

8 | CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

This paper has proposed and validated an empirical model that links KIM, creativity and responsible green innovation in the agribusiness sector. Our empirical model confirms the relationships established in H1, H2 and H5, with employee creativity and responsible green innovation having a potential positive mediating effect on H5. The identified potential mediation roles of creativity and responsible green innovation could strengthen the relationships between economic, strategic and innovative goals in the agribusiness sector in countries like the Dominican Republic as well as elsewhere (Briones Peñalver et al., 2018; Salvini et al., 2018; Stranieri et al., 2019). Although there are important differences based on the size of agribusinesses, they contribute to the research and development process with new agricultural knowledge that seeks to make better use of their resources. The non-confirmation of both H3 and H4 is the result of the degree of influence of the primary actors, the collaborators and the farmers with the process of environmental valorisation on economic or aspirational issues of the agricultural entities.

The results obtained from a case study reveal that in this sector and worldwide, KIM could have a direct and positive relationship with employee creativity and responsible green innovation, and that both positively contribute to enhancing firm performance. Results also suggest that KIM can favour creativity in this economic sector because it contributes to establishing appropriate working conditions for the generation and implementation of new ideas (Gartner, 2011). The synchronisation of intangible resources and the prioritisation of knowledge innovation to cope with market volatility and turbulence could help consolidate relationships which could in turn permeate the entire organisational structure of agribusinesses.

Moreover, KIM could help agribusiness organisations work towards achieving sustainable development goals by mitigating their lack of information or deep knowledge about their external environments (stakeholders included), strengthening their green and other innovation capabilities (Hadj, 2020). In this regard, our research offers a valuable approach that integrates responsible green innovation by raising individual and group awareness about both organisational and environmental issues. It also shows that there could be internal and knowledge-based triggers in companies to strengthen their focus on stakeholders, anticipating future risks and creating resilience to potential external or environmental situations (Sawyer, 2011).

Our analysis of agribusiness is developed with data from a single country study of Dominican Republic, and, therefore, the results and implications obtained would need to be carefully contextualised when extrapolated to other regions of the world. Given their dual but separate roles in helping individuals and groups, the constructs of employee creativity and responsible green innovation in the agribusiness environment could have shortcomings associated with the characteristics that positively promote motivation, responsible resource use and management practices. There could also be potential misalignments between personal and collective behaviours if internal or external challenges are not fully considered (Amabile et al., 1996).

Therefore, other factors need to be considered within the constructs of creativity and responsible green innovation.

For future research we would like to further investigate the mediating roles and effects of these constructs, their differences as well as possible impacts in existing, improved or radically new business practices in the agribusiness sector worldwide.

CONFLICT OF INTERESTS

There are no conflict of interests.

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