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Sustainability and Creativity Management in Agribusiness

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Agribusinesses are closely linked to natural resources, and sustainability is relatively important to companies indulged in agribusiness. This is especially true in developing countries, whose agricultural activities have largely focused on increasing efficiency rather than protecting the natural environment. Agribusinesses in these countries are currently facing the challenge of adopting corporate social responsibility practices. In this context, individual and collective creativity can be decisive. Our objective is to assess the role of creativity in improving knowledge management and innovation, environmental sustainability and performance in the agribusiness sector in the Dominican Republic. We develop a model linking green creativity with corporate social responsibility, knowledge-based innovation and sustainability performance, and formulate and validate numerous hypotheses that could help to better understand the different relationships and impacts between these elements. Testing these hypotheses could have implications for agribusiness management and policy in the Dominican Republic and possibly in other countries with a similar nature of their productive structure.

Keywords: Corporate social responsibility (CSR), Ecological behavior (EB), Environmental, Knowledge and innovation management (KIM), Performance

Introduction

There is a growing academic interest in the implementation of activities that facilitate creativity, knowledge, innovation and sustainability in organizations. The capabilities that harness creative potential in companies may differ according to their cultural context. New models emerging from Creative Management (CM) in companies, intangible management and Corporate Social Responsibility (CSR) are interesting areas of academic research.[1] This article will address creativity and knowledge models and agribusiness sustainability strategies in Latin America, specifically in the Dominican Republic, a middle-income country, with an economy in the process of diversification and in frank agro-industrial growth. Our objective is to investigate the following topics: Creative Management (CM), Knowledge and Innovation Management (KIM), Sustainability and Performance.

Conceptual Framework

Latin American agro-industries have quite varied structures with different development policies that promote creative reforms.[2] In this sense, support is provided in all the phases of innovative processes, from the exploration of problems to the design and evaluation of creative solutions, including the successful introduction of products into the market through the identification, acquisition, development, distribution, use, and preservation of knowledge.[3] Networks stimulate creative and innovative behavior by providing access to additional knowledge.[4] Organizational creativity is significantly influenced by group design and organizational context. KIM increases the capacity of companies to respond to the turbulence of their environment, contributing to the creation of processes that guide better decision-making and provide better business results.[5] This is also a social phenomenon since without knowledge transfer to the productive sector, the possibilities of economic development would be reduced and long-term transformational spill-over would be degraded.[6]

A supportive, free environment promotes the creative processes of employees.[7] Employees' positive perceptions of CSR trigger more permanent and anchored environmental behavior.[8] Creativity is linked to environmental sustainability, and this is reflected in the scientific literature.[9] KIM in this area

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is a step toward implementing creativity processes in companies and generating Ecological Behavior (EB) in employees.[10]

Hypothesis Development

Globalization increases the competitiveness of agribusinesses. Therefore, the effect of a direct strategy that strengthens innovation in agribusinesses contributes to an increase in their competitive advantage in the market.[11] Environmental strategies aim to preserve the cultural, social, and economic aspects of the environment in which a company operates and could mitigate the effects of the company's actions on its natural environment.[12] The effective implementation of CSR strategies leads to organizations performing better environmentally.[13] Agribusinesses are currently affected by close public scrutiny and growing criticism due to their globalization and internationalization strategies. Cost efficiency can lead to negative environmental impact such as environment degradation, vulnerable populations and developing countries.[11–13] Agribusinesses are no strangers to collaboration. Cooperation among companies promotes sustainable development. Besides economic benefits, it contributes to conserving the landscape, job creation, and preserving traditions.[10–12] The need for flexibility, capacity development, and other resources are drivers of cooperation agreements among companies. The growing spiral of social conflicts related to food production mechanisms and those with negative consequences on the natural environment, ethical concerns, and health put agro-industrial companies at the center of the solution. Agribusinesses are exposed to challenges posed by changes in climate, demographics, trade, and the environment.[13] Furthermore, innovation is not only an economic and/or technological instrument, since it achieves the integration of factors related to human potential; in recent years, the agro-industrial sector has invested in technological solutions, especially in products that are eco-friendly with natural resources and the rural environment. Studies have shown the concrete effects of creativity on sustainability.[7–13]

Creativity Management involves knowledge skills, environmental aspects, and social and environmental processes of change that produce creative thinking in new organizational structures to stimulate creative habits. This creativity is seen as the means for organizations to thrive in dynamic environments, respond to challenges, and develop new capabilities. Thus, the first hypothesis is formulated as: *CSR has a positive influence on Creativity Management (H1).* Environmental challenges are a new manifestation of KIM, so companies can gain a competitive advantage by carrying out creative activities for the greater good.

We can conceptualize innovation as the implementation of ideas, while creativity is related to the production of ideas. The results of exploring these ideas generate new actions where a creative product emerges. Innovation is understood as a process in which companies create and define problems and then develop new knowledge. The adoption of KIM helps organizations generate innovative products and competitive services, and in terms of employee creativity, it produces a positive relationship. We therefore propose the following hypothesis: *Creativity management positively impacts KIM (H2).* The development of environmental sustainability is carried out through activities that allow companies to reduce the negative impact of their operations on the environment while improving performance.

The effects of CSR measures as corporate environmental management practices and ecological aspects produce creative results that promote sustainability. This framework should create the conditions for companies to develop products and services with ecological benefits. In this study, CSR is emphasized and hypothesized mainly for agribusinesses: *CSR has a positive influence on environmental sustainability (H3).* Environmental sustainability is based on ecosystem services that come from the use of renewable and non-renewable resources.

Companies should proactively implement environmentally friendly strategies that go beyond mere compliance. Sustainability is considered from the establishment of processes and interpersonal actions which affect the capacity, motivation, and opportunities to develop ecological creativity. We define the following hypothesis: *Creativity Management has a positive influence on environmental sustainability (H4).* Implementing eco-friendly strategies would trigger positive attitudes and creative behavior in employees. Employee behavior and attitudes are key organizational factors that can have a positive impact on EB: *Creativity Management has a positive influence on EB (H5).*

Positive attitudes in employees improve creativity in terms of their use of resources, which enhances performance. In studies on creativity, quality is

assessed by criteria such as novelty. We understand green creativity as the development of new ideas about ecological products, services, processes, or creativity management practices: *Creativity Management has a positive influence on performance (H6).* As knowledge is created and disseminated throughout companies, it has the potential to contribute to organizational value through the relationship of knowledge management and performance.

This could lead to a positive relationship between KIM and company results: *KIM has a positive influence on performance (H7).* Environmental sustainability comes from a set of activities that allow companies to reduce the negative impact of their operations on the environment while improving their organizations' performance. Considering sustainable activities through certain aspects of environmental management practices could reduce undesirable activities and improve company performance: *Environmental sustainability has a positive influence on performance (H8).*

The ecological efficiency of resource use increases the commercial possibilities of companies and their economic growth. Therefore, we propose a positive relationship with business performance based on the organizational EB that contributes to the improvement of environmental performance: *EB has a positive influence on performance (H9).* The work environment is much more inclined towards creative tasks and providing equal opportunities to employees is one of the main aspects of CSR. Finally, we formulate this hypothesis: *CSR has a positive influence on performance (H10).* The correlations are presented in a structural model that presents the different constructs that graphically idealize the proposed hypotheses (Fig. 1)

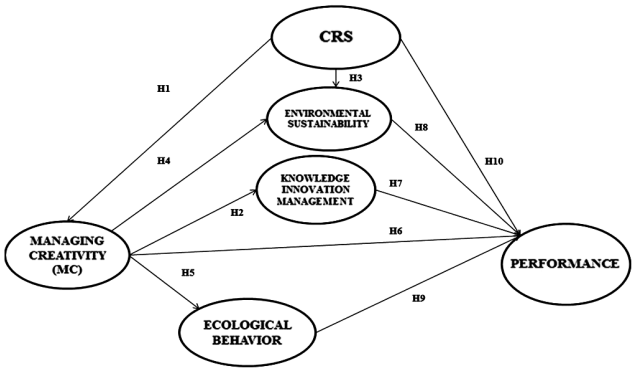

Fig. 1 — Conceptual framework of the proposed theoretical model showing the unidirectional relationship of the constructs based on the hypotheses proposed

Materials and Methods

The statistical population of this study includes 112 agribusiness companies and cooperatives. For data collection purposes, a survey was devised after performing a literature review. For this case, a series of relationships are proposed that associate different aspects of sustainable management, with drivers in the areas of knowledge management, environment and creative management (Fig. 1). We made an empirical study and used the statistical software SPSS. The variables were measured by means of 5-point Likert scales which are continuous variables - where a value of 1 means total disagreement of the individual with the item and a value of 5 means total agreement with the item - and the respondent was asked to express his or her degree of agreement with the item. We have applied the Principal Components Analysis (PCA) as a factor extraction method as a technique to reduce the dimensionality of the data and Cronbach´s Alpha (CA = α), which indicates good internal consistency. PCA denotes, through the communalities, the proportion of variance of the variance explained. PCA maximizes the total variance explained with the minimum number of factors extracted. "Varimax" is used as factor rotation which is an orthogonal rotation that minimizes the number of variables. In relation to the factor loadings of the items, we chose those with a loading of at least 0.50,[14] and we applied the Kaiser Meyer Olkin (KMO) test, which explains the degree of sample and we performed Bartlett Sphericity Test to study the values. If the parameters relating to the KMO and the Bartlett Sphericity Test are acceptable, then we take as a first consideration that the variables can be collected in the latent factors. With the PCA, linear combinations of the variables have been obtained and the extracted factors are independent of each other, thus eliminating possible problems of multicollinearity prior to the linear regression. The linear regression analysis studies the relationship between an independent variable and a dependent variable, both are continuous variables provided by the PCA.

The validity of the PCA was verified by the Bartlett Sphericity Test and the KMO test after carrying out the factorial analysis (see Table 1). In this table, the criterion of percentage of variance explained (PCA: total Variance) representing at least 65% of the total variance has been provided, and thus the scales have been reduced to a single factor.[14]

Table 1 — Variance by each factor or component

PCA (factor)	Components	% of variance
CSR	Actions taken by management	14.9%
	Employee perceptions of CSR	11.0%
	Reward, compensation, and environmental benefits	9.9%
	Stakeholder empowerment and participation	9.8%
	CSR with customers	8.7%
	Employee CSR	8.3%
	Employee CSR in the environment	6.7%
	Economic CSR	5.8%
	Education and philanthropy in the community	4.6%
PCA: total Variance	80.138%	
CA= α	0.963	
CREATIVITY MANAGEMENT (CM)	Characteristics of organizational resources	16.9%
	Creative personality	12.7%
	Individual creative behavior	11.7%
	Group creativity	9.6%
	Intrinsic and individual creativity	8.9%
	Creating internal motivation	8.7%
	Inventive creativity for quality	8.2%
PCA: total Variance	77.087%	
CA= α	0.925	
KIM	Combination of knowledge	15.8%
	Knowledge utilization	11.7%
	Knowledge creation process	10.0%
	Knowledge exchange	9.5%
	Utilization of knowledge stock	9.0%
	Team knowledge transfer and use	8.2%
	Knowledge innovation capacity	7.2%
	Use of knowledge by the team	6.7%
PCA: total Variance	78.51%	
CA= α: Cronbach's alpha coefficient	0.876	
ENVIRONMENTAL SUSTAINABILITY	Responsible innovation of the green creativity team	16.5%
	Inclusion and anticipation of responsible innovation	11.5%
	Green creativity	11.3%
	Dynamic ecological capabilities (Knowledge)	10.8%
	Dynamic ecological capabilities (Management)	10.6%
	Green dynamic capabilities (Resources)	9.9%
PCA: total Variance	70.70%	
CA= α: Cronbach's alpha coefficient	0.857	
EB	Green organizational identity	15.6%
	Resource commitment to green innovation	13.2%
	Development of green ecological management	13.1%
	Development of ecological products or services	10.2%
	Commitment to green management	9.9%
	Identification with the organizational identity	9.6%
PCA: total Variance	71.89%	
CA= α: Cronbach's alpha coefficient	0.782	
PERFORMANCE	Performance of the development of ecological products or services	21.7%
	Environmental performance	15.2%
	Innovative performance	15.1%
	Support and economic performance	13.6%
PCA: total Variance	65.70%	
CA= α: Cronbach's alpha coefficient	0.820	

- PCA: total Variance. $p < 0.01$. Kaiser-Meyer-Olkin measure of sampling adequacy (KMO): values>0.5.
- Cronbach's alpha coefficient (CA= α): acceptable value between 0.6 and 0.9.

Internal consistency was assessed by Cronbach's alpha coefficient and the values obtained are within the recommended range (0.782–0.963).[14]

We carry out lineal regressions with which to contrast the formulated hypotheses (see Table 2). The R (determination coefficients: R, R2, and $R_{adjusted}$) were used as a measure of model fit, indicating the proportion of variance in the dependent variable that is explained by the independent variable. The higher the coefficient, the better the independent variables

Table 2 — Analysis of linear regressions

Hypothesis	R	R^2	$R_{adjusted}$	Durbin-Watson (DW)	Standard error estimation	ANOVA (F)	Constant		Standardized coefficients (Beta)	Test T (Sig)
							Standardized coefficients (Beta)	Test T (Sig)		
H1	0.767[a]	0.588	0.541	2.064	0.25857	12.297[a]		0.845	**H1**	
	Actions by company management								0.459	0.000
	CSR with customers								0.362	0.001
	Employee CSR								0.288	0.005
	CSR in the environment								0.315	0.002
	Economic CSR								0.267	0.009
H2	0.791[a]	0.626	0.582	1.909	0.23063	14.373[a]		0.779	**H2**	
	Characteristics of organizational resources								0.492	0.000
	Creative personality								0.276	0.005
	Creative behavior								0.287	0.004
	Group creativity								0.383	0.000
	Intrinsic and individual creativity								0.273	0.005
H3	0.424[a]	0.179	0.082	2.336	0.39733	1.838[c]		0.849	**H3**	
	Actions by company management								0.211	0.141
	CSR with customers								0.040	0.780
	Employee CSR								0.340	0.019
	CSR in the environment								−0.082	0.563
	Economic CSR								−0.118	0.402
H4	0.486[a]	0.236	0.112	2.325	0.38543	1.902[c]		0.884	**H4**	
	Characteristics of organizational resources								0.137	0.310
	Creative personality								0.082	0.541
	Creative behavior								0.208	0.128
	Group creativity								0.280	0.042
	Intrinsic and individual								0.192	0.156
	Creating internal motivation								0.034	0.800
	Inventive creativity for quality								0.216	0.112
H5	457[a]	0.209	0.070	2.091	0.39490	4.114[a]		0.603	**H5**	
	Characteristics of organizational resources								0.259	0.073
	Creative personality								0.220	0.127
	Creative behavior								0.148	0.301
	Group creativity								0.157	0.271
	Intrinsic and individual								0.174	0.223
	Creating internal motivation								0.035	0.803
	Inventive creativity for quality								0.212	0.142
H6	0.526[a]	0.276	0.231	1.989	0.44269	6.111[b]		0.954	**H6**	
	Characteristics of organizational resources								0.269	0.033
	Group creativity								0.250	0.047
	Intrinsic and individual								0.378	0.003
H7	462[a]	0.213	0.197	2.244	0.44878	12.747[b]		0.808	**H7**	
	Innovation and knowledge management								0.462	0.001
H8	0.598[a]	0.357	0.344	2.284	0.41061	27.242[a]		0.860	**H8**	
	Environmental sustainability								0.598	0.000
H9	0.570[a]	0.325	0.311	2.090	0.40444	22.176[a]		0.574	**H9**	
	Ecological behavior (EB)								0.570	0.000
					CRS				**H10**	
H10									0.367	0.009
	0.367[a]	0.135	0.117	2.187	0.46771	7.330[b]		0.791		

Source— Own production, where: R (determination coefficients: R, R2, and $R_{adjusted}$); Durbin-Watson (DW); ANOVA (F and Sig.); Standardized coefficients (Beta); Sig.: p <0.01a; p <0.05b, p <0.1c

are at predicting the endogenous variable (H1:0.588, H2: 0.626 and H8: 0.357 are the hypotheses that have a higher R2). Durbin-Watson (DW) has informed us of the degree of independence that exists between the residuals, taking the value close to 2 in all cases because they are independent and range from (1.9–2.3). The ANOVA (F) reports whether there is a significant relationship between the independent and the dependent variables, and the F-statistic allows us to test whether the regression model fits the data, and when the significance level is less than 0.05, then the independent predictor variables can be said to be linearly related to the dependent variable. All hypotheses have been confirmed and the results and implications presented, and F-Statistic becomes significant.

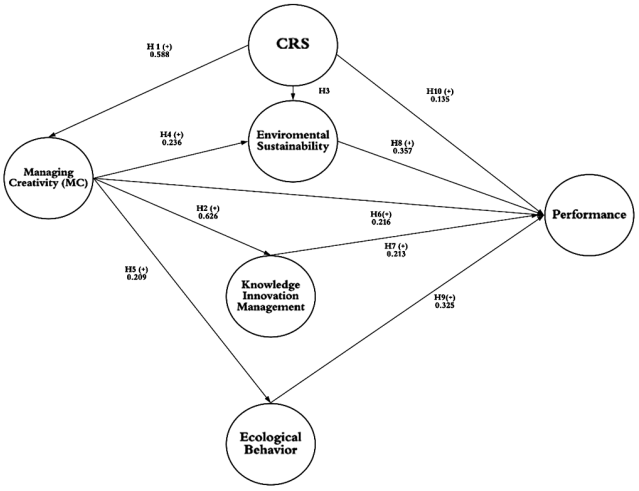

Fig. 2 — Confirmation of the hypothesis

Results and Discussion

The context of a developing country poses enormous challenges. Companies are under great stress due to the dynamics of internal and external changes and impacts. CSR is an attractive strategic option in the business environment because it has become a real source of value creation for organizations, which are experiencing rapid and increasingly complex growth. It should be noted that CSR guidelines and commitments vary considerably depending on the context of each country. However, it generally promotes creative management in the positive exploitation of mechanisms centered on social, human, and economic issues.

It should be emphasized that based on the results, the only hypothesis that has not been confirmed is the relationship between Corporate Social Responsibility and Environmental Sustainability, which is a product of the fact that in Dominican agribusinesses there is a transition of adaptation to more complete processes of refinement that allow a deepening of environmental guidelines. This is also because instrumentalized actions have been prioritized that generate deficiencies and do not strengthen the human value, even more so in a rural environment (Fig. 2 & Table 2). This is a valuable contribution for further research.

In various business ecosystems, there is a novel articulation that allows a degree of implementation of CSR in various factors that promote sustainability. The integration of knowledge management, the exploitation of creativity in its differentiated components with the environment produces positive linkages that impact performance. There are a number of researches that promote these relationships.[15–17] even more evident in medium and large agricultural companies.

Managing Creativity is explained by the CSR measures with a significant and positive dependence. Managing Creativity strongly influences Knowledge Innovation Management previously to improve performance. On the other hand, Managing Creativity has a significant impact on Environmental Sustainability, the latter being a dependent measure of CSR. Hence, we observe that Environmental Sustainability mediates the activities of CSR and Managing Creativity so that agribusiness performance support decisions related to green production, innovation, and other positive economic and environmental services for society.

Environmental challenges can be new manifestations of innovation in organizations, allowing them to gain competitive advantages through creative activities that enhance environmental sustainability. This could involve the integration of ecosystem services that promote resource reuse, optimal pollutant management and waste absorption.

The development of environmental sustainability is carried out through activities that allow companies to reduce the negative impact of their operations on the environment while improving their performance. The results suggest that the total effect of CSR and KIM may be mediated by other variables of Creativity Management related to employees, organizational resources, and motivation. Therefore, further research is necessary to study what these mediating variables might be.

Conclusions

The study suggests that creativity and knowledge management are key factors in the positive impact of CSR on the sustainability of agribusinesses. They foster the integration of attitudes that promote CSR actions. Direct contact with the environment encourages a culture of conservation, creativity management, and the creation of technological networks of knowledge and innovation. We believe that the agri-food sector needs to invest in activities that produce corporate social responsibility benefits, and to do this, knowledge, innovation, and collaboration among companies are key.

Environmental sustainability in agricultural markets is responsive to creative processes. Through resources, management, and environmental knowledge, employees must anticipate the construction of rural development in developing countries. Managers, through creative processes, empowerment, and employee motivation, should generate knowledge for better EB and retrain through KIM. CSR and environmental sustainability measures enhance other strategies. For future lines of work, the involvement of other economic sectors and the evaluation of CEOs as a determining factor of sustainable development will be considered. CEO creativity promotes the development of green capabilities, along with knowledge of land management and environmental resources.

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