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The Role of Innovation, Business Administration, and Proper Governance in Food and Agriculture Sector

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Abstract

The industry of food and agricultural is vital to maintaining human life, guaranteeing food protection, and promoting global economic growth. In recent times, the industry has faced numerous challenges, including population growth, climate change, resource depletion, and increasing demand for sustainable practices. To address these challenges and unlock its full potential, the sector requires a transformative approach that embraces innovation, effective business administration, and proper governance. Innovation stands at the forefront of enhancing productivity, sustainability, and resilience in the food and agriculture sector. The integration of cutting-edge technologies such as precision agriculture, drones, and advanced genetics has the potential to revolutionize farming practices. Furthermore, the development of novel food products and processing techniques can cater to evolving consumer preferences while minimizing waste and environmental impact. Innovations that improve post-harvest handling, distribution, and storage can significantly reduce food losses and ensure a stable food supply chain. Business administration plays a crucial role in fostering growth and stability within the sector. Efficient supply chain management, streamlined logistics, and optimized production processes can lead to increased profitability and reduced costs. Effective marketing and branding strategies can also create awareness of sustainable agricultural practices and drive consumer preferences towards environmentally responsible products.

Keywords: Desmidiales, CameroonEstuary, dynamic, Mangroves, Physicochemistry

1. Introduction

Agricultural development Schedules are being driven more and more by an emphasis on cutting-edge technology, such as genetically modified (GM) and hybrids agricultural Produce, yet there is little proof that such techniques are effective for subsistence farming. Agro-ecological methods, such as natural farming, primarily continue to be an addition to food

development objectives (Ashraf *et al* ., 2021). The emphasis on cutting-edge technology, such as hybrids and genetically modified (GM) Green Revolutions crops, is rapidly influencing agricultural growing goals. But there is little evidence such modern techniques help agricultural growers. Agro-ecological practices, such as natural farming, mostly still serve as an afterthought to farming development goals (Adenle*et al.,* 2019). The revolutionary technology of additive manufacturing (AM) appears to be one which significantly alters the food and agriculture industries. Straight from the computer framework, an actual element may be produced by building up layers of a certain element in accordance with the original specifications. This gives the part's structure and size a tone of adaptability. It develops a unique consumer feature that is not feasible to produce using current technology (Javaid and Haleem, 2019). State-owned businesses in India, on the reverse together, are a fierce competitor for public market business since they receive special treatment regarding applies to funding and have immediate access to supplies and facilities. Small and medium-sized businesses find it challenging to implement Industrial 4.0 into their daily procedures because of several restrictions (Tang *et al.,* 2022). Since international rivalry in the agriculture industry rises, some developed nations appear to be responding by producing additional if the same. Businesses are getting bigger and smaller, and they're concentrating on efficiencies of scales, cost-cutting, and operational performance (Barth *et al.,* 2021). By nation, the Bank determines a government measure that ranges from -1.5 (the worst) to -0.5 (the best).

Regan (2019) present effect of these methods, particularly the economic, social, psychological, and societal concerns that may result from broad acceptance, as study and development surrounding effective farms continue to grow. The present research centers in especially on the various perceptions given to danger problems by various players as it examines the believed dangers and advantages resulting from the growth of clever agricultural in Irish. (Apostolopoulos *et al.,* 2021) provide relevant material focused on the effects of agricultural products innovation, governance initiatives and assistance, and the sector's move into digitalization, original concepts, and fresh business strategies. (Fleming, *et al.,* 2021) presentinvolves people aiming to change farming profitability and the environment via technological devices, visible and secure studies structures are wrestling in the difficulties and potential of incorporating aspects of dependable creativity into their study and growth programmers. (Rodrigues*et al.,* 2021) present purpose it's ascertain these business' handled the disturbance that the closure brought to the populace and their ability to do business on a daily basis. In Portuguese before that the shutdown, a survey and a scientific technique (descriptive and inductive) were utilized to achieve this goal. (Fielke, *et al.,* 2019) provide governmental structure incorporating these techniques are examined in our study, together with issues for further administration in Australia and afterward. Essentially, in light of the effects on electronic progress on regulations, we depend on Agricultural Innovation Systems (AIS) theorization.(Xu*et al.,* 2021) present is to look at the link regarding official support, R&D spending, and creative outcomes for traded Chinese medical businesses from 2009 to 2015. The findings demonstrate that federal R&D incentives can encourage company R&D expenditure; governance subsides had a beneficial effect on R&D investment while having no discernible effect on technological productivity. Bronson (2019) present focus on farming, that gets fewer resources than major industries include medical care, furthers environmental scientific studies on big information and knowledge systems. A paradigm for responsibility creativity to shift focus to the ecological and political implications of big data "upstream," to the choosing of farming statistics itself and the creation of its institutions. (Khan *et al.,* 2019)provides additionally, originality has a substantial mediating role across organizational success and external factors. Organizational productivity is enhanced through development. Additionally, there is a strong

correlation among growth and organizational success and inventive environment. Organizational efficiency is heavily influenced by technology and inventive cultures. (Tubb, and Seba*et al.,* 2021) provide commercial agricultural producing paradigm, that has almost hit its limitations in respect of quantity, attracts, and performance, stands in sharp contrasts to this quick progress. The animal foods would become the next to experience an entire brunt of probably destructive potential of contemporary food since they are the least effective and socially susceptible component of this framework. (Movilla-Pateiro *et al.,* 2021)provide in order to help participants overcome the difficulties concerned, this piece covers the current level of practice in farming and food safety with a focus on measures for tracking performance towards their attainment. Objectives, obstacles, potential solutions, findings, and suggestions are taken into account. In order to discover long-term resolutions in this situation, institutional reforms must be made for the advantage of the less wealthy players while also reforming local economic and subsistence farmers.

2. Methodological approach and model development

They employ a systemic review of a carefully selected sampling of scientific farming government research to identify the components of effective farming management to enhance India's agricultural industry. This approach detects, assesses, and generates the papers written by academics, specialists, and investigators. This comprehensive analysis follows a series of guidelines that prevents biased in the study selection. We gathered scholarly works from seven distinct educational Web of Understanding, Alps, ACS, Jstor, and Rsc sciences are a few examples. Someone includes a time frame covered by our scrutiny. Everyone identify the key elements/variables from the research by utilizing the meta-analysis approach, and they also give same elements to agricultural professors for ranking utilizing the stochastic probability approach. The factors are also submitted to a chosen panel of 10 economic specialists, who will change, add, or remove factors from the meta-analysis to determine the key farming government factors in India. They use a Linear Comparisons Network to evaluate the factors. Snowflake sample is used to choose the scholars, who then use the Democratic technique to finish their rating. Then, employing the Fuzzy technique, we evaluate the Stochastic Efficiency approach's universal farming government factors to individuals from a pairing contrast vector.

Meta-synthesis Model

In this approach, available scholar conducts a thorough investigation and combines the results of associated projects to produce an interpretative analysis of given data. The research seven-step process was as follows:

Step 1: *the review questions of Formulating*

The meta-synthesis's study objectives are: What factors influence farming the oversight? What significance and relevance has every factor in farming management have? Who are the professionals identifying the factors explaining farming government? What are the positive effects does not farm governments have on the local finances.

Step 2: *A systematic literature survey*

Creating a comprehensive list of papers that may be used in the qualitatively systematic review requires a lot of work. Over the course of the investigation, phrases are found and applied to every database that is accessible. For the years 2000-2018, a variety of databases, journals, keywords, and search engines are examined. 252 papers were used in this procedure.

Step 3: *Appropriate research of screening and selecting*

In this stage, a method for comparing study similarity will be developed utilizing the subtitle, abstracted, and substance of each study as comparative criteria.

Step 4: *The article from extracting in formations*
The material title, author, publication year, and other significant variables are used to classify data from articles. The set of variables for the Meta-Synthesis is decided at this stage.

Step 5: *findings the Analyzing and synthesizing of qualitative*
Throughout ascending series to get basic information for the Stochastic Probability approach, we utilize the elements from the Meta-Synthesis research and combine them into ideas and then fundamental groups. Four groupings, eleven ideas, and 22 elements were identified by the academics from the 80 publications on farming management that were chosen. Since all prior analyses concentrated on only one facet of farming management, a comprehensive examination of economic management has never being carried out. A logical and structured paradigm has not being developed to take into account the many aspects of farming organization. "**Table 1**" displays the variable associated using every grouping and idea.

Table1: Finding the Meta-Synthesis

Categories	Concepts	Factors
Economic	Production and Management Marketing Natural resources Development	• Technologies and organization Charges on Operation expenses in agriculture. • Advertisement effectiveness techniques Economy and volume of manufacturing Lands used for farming. • The growth of finance industries, stock marketplaces and enterprises. • GDP proportion of agriculture and services.
Political	Domestic International	• Industry participants' contributions to governmental legislation Systems of money and financing law.
Social	General Governmental	• Fight poor and uphold rights public involvement. • Utilization of collective businesses and organizations in the agriculture economy establishment and growth of consultancy firms, community outreach, and instruction.
Environment	Governmental laws International laws	• Sustainability administration of water. • Economic and environmental safety adherence to the rules.

Step 6: *Control the extracted factors*
The categorized of variables for agriculture government, they turned to the specialists. Cohen's Kappa Index is utilized to determine if the panel's categorization of the criteria is generally agreed

upon. Measurement of the relative weight of different elements is the goal of a meta-analysis research. The chance of some aspect is essential is taken into account in the numerical estimate of relevance provided by the Desmond Density technique. The possibility that a specific element will be referenced in the research is where the chance comes from increasing insecurity results from a structure's greater Maximum efficiency since it contains more redundant knowledge. Compared to activities with lesser probabilities, occurrences with higher probabilities provide the network with fewer relevant materials.

According to the Stochastic Probability technique, a factor's quantity of relevance is determined by how frequently it appears in the research. The confidence and significance factors are determined using formulas 1 and 2, accordingly.

$$F \approx T\{O_1, O_2, \dots, O_m,\} = -l \sum_{j=1}^{n} [o_{ji} jm o_{ji}], (i = 1,2, \dots, m) \qquad (1)$$

Here, the probability distributions for each component j express the uncertainty coefficient $Fi . Pji$ is the likelihood that idea j uses factor i.

$$O_{ji} = \frac{e_{ji}}{\sum_{j=1}^{n} e_{ji}} (j = 1,2, \dots, n; i = 1,2, \dots, m), l = \frac{1}{Jmn} \qquad (2)$$

$m =$ the number of studies

$\sum_{j=1}^{n} e_{ji} =$ Frequency of studies for each concept

$$x_i = \frac{F_i}{\sum_{j=1}^{m} F_i} \qquad (3)$$

xi is the importance of each study from the Shannon entropy method.

Fuzzy hierarchical analysis method

There is a ton of work comparing answers huge queries containing ambiguous judgments. Because people perceptions are vague, they are less good at generating statistical forecasts but better effective at forming subjective ones. Due to the ambiguity in preferred judgments, rating possibilities is ambiguous, and it is challenging to assess the constancy of desires. In this situation, fuzzy approaches are useful.

$$T_l = \sum_{i=1}^{m} N_{li} * \left[\sum_{j=1}^{n} \sum_{i=1}^{m} N_{li}\right]^{-1} \qquad (4)$$

Where, Mkj stands for the rating for variable j and row k. The relative order scale for the two fuzzy values $M1$ and $M2$, which serve as the upper (u) and lower (l) boundaries for the position, is calculated using the fuzzy analytical approach, and is displayed as $V (N1 > N2)$ in equation (2).

$$N_2 = (J_2, n_2, v_2), N_1 = (J_1, n_1, v_1)(5)$$

$$\begin{cases} U(N_1 \geq N_2) = 1 \\ U(N_1 \geq N_2) = Ghs(N_1 \cap N_2) \end{cases} If N_1 \geq N_2 , \qquad otherwise$$

$$Ghs(N_1 \cap N_2) = \frac{v_1 - k_2}{(v_1 - k_2) + (n_2 - n_1)} \qquad (6)$$

The anomalous vector of the fuzzy analysis process, denoted by X'(w), and the value of the weight vector (S) of the components are identical:

$$X'^{(w_1)} = Min\{U(T_j \geq T_l)\} \rightarrow X'^{(w_1)} = [X'^{(d_1)}, X'^{(d_1)}, \dots, X'^{(d_m)}]^S, l = 1,2, \dots m \qquad (7)$$

$$l \neq i$$

$$X_j = \frac{X_j}{\Sigma X_j} \tag{8}$$

3. Results

The categorization of variables is evaluated using Cohen's Kappa. They deny the default hypotheses that the variables are separate and come to the conclusion that a variables and ideas are acceptable since the estimated statistical of 0.68 has significance at the 0.001 confidence value. The stochastic probability technique findings and the overall score. The correlations most significant and highly ranked factors of agriculture government global are multilateral rules, community engagement, and adherence to criteria. In the end, we contrast the variables affecting world agriculture government based on the Stochastic Probability approach with based on the Fuzzy Hierarchy Analyses methods.

$$\left[\sum_{j=1}^{n}\sum_{i=1}^{m} N_{ji}\right]^{-1} = (0.009, 0.01, 0.013) \tag{9}$$

The abnormal weight vector (S) of the factors in the economic area (calculated from equation 5) Is:

$$X, (W_j) = [0, 0.5, 0.2, 0.6, 0.1, 0.09, 0.09, 0.6, 0.7]^S \tag{10}$$

The normalized factor weights (calculated from equation 6) are:

$$X_j = (0, 0.17, 0.06, 0.20, 0.03, 0.31, 0.31, 0.20, 0.24 \tag{11}$$

The same formulae are used to determine the anomalous and normalized factor weights of
The following variables for the political, Social, and environment areas:

$$W(Wj) = [0.17, 0.02, 0.12, 0.20, 0.40, 0.08, 0.12, 0.13, 0.34]^S \tag{12}$$

$$X_j = (0.10, 0.012, 0.07, 0.12, 0.25, 0.05, 0.07, 0.08, 0.21) \tag{13}$$

On the basis of the survey results and after identifying the key world agriculture government characteristics, we create matching matrices. One respondent's score in the finance category is shown in "**Table 2**". Equation (1) is used to determine the pair comparisons matrix's total fuzzy values.

Table 2: Comparison Matrix for One Respondent in the Economic Area

	Agricultural Share of GDP	Infrastructure	Development of institutions, capital markets and financial markets	Efficiency and production	Agricultural land	Operating expense and taxes	Marketing efficiency systems	Poverty Reduction	Mechanization and technology

Agricultural Share of GDP	(1,1,1)	(5/2,3,7/2)	(5/2,3,7/2)	(2,5/2,3)	(5/2,3,7/2)	(3/2,2,5/2)	(2,5/2,3)	(1,1,1)	(3/2,2,5/2)
Infrastructure	(2/5,1/3,2/7)	(1,1,1)	(1/2,1,3/2)	(3/2,2,5/2)	(2,5/2,3)	(1,1,1)	(1,3/2,2)	(3/2,2,5/2)	(1,1,1)
Development of institutions, capital markets and financial markets	(2/5,1/3,2/7)	(2,1,2/3)	(1,1,1)	(1,1,1)	(3/2,2,5/2)	(1,1,1)	(2,5/2,3)	(1,3/2,2)	(3/2,2,5/2)
Efficiency and production	(1/2,2/5,1/3)	(2/3,1/2,2/5)	(1,1,1)	(1,1,1)	(1,3/2,2)	(1/2,1,3/2)	(1/2,1,3/2)	(1/2,1,3/2)	(1/2,1,3/2)
Agricultural land	(2/5,1/3,2/7)	(1/2,2/5,1/3)	(2/3,1/2,2/5)	(1,2/3,1/2)	(1,1,1)	(1/2,1,3/2)	(1,1,1)	(1/2,1,3/2)	(1/2,1,3/2)
Operating expense and taxes	(2/3,1/2,2/5)	(1,2/3,1/2)	(1/2,2/5,1/3)	(2,1,2/3)	(2,1,2/3)	(1,1,1)	(1,1,1)	(1,1,1)	(1,1,1)
Marketing efficiency systems	(1/2,2/5,1/3)	(1,2/3,1/2)	(1/2,2/5,1/3)	(2,1,2/3)	(1,1,1)	(1,1,1)	(1,1,1)	(2,5/2,3)	(1,3/2,2)
Poverty Reduction	(1,1,1)	(2/3,1/2,2/5)	(1,2/3,1/2)	(2,1,2/3)	(2,1,2/3)	(1,1,1)	(1/2,2/5,1/3)	(1,1,1)	(3/2,2,5/2)
Mechanization and technology	(2/3,1/2,2/5)	(1,1,1)	(2/3,1/2,2/5)	(2,1,2/3)	(2,1,2/3)	(1,1,1)	(1,2/3,1/2)	(2/3,1/2,2/5)	(1,1,1)

4.   Conclusions and Discussion

Nutrition and agriculture growth are significant problems for emerging nations. Although there has been a lot of work put into advancing agricultural technology, physical facilities, and learning, academics and lawmakers have currently given increased weight to the influence of management on agriculture success. In this study, we identified key management factors for India's agriculture sector using the meta-analysis and fuzzy analytical approaches. In the politics, community, and ecological spheres, they include occupation in agriculture, community involvement, and cooperation businesses; in the economical sphere, they include greater output as well as finance and equity exchanges.

To increase jobs, economic activity, and community engagement in India's crop production, the policy suggestion is to develop farming management with a wide strategy that covers the whole industry. Both methodologies identify cooperation and arrange involvement businesses. It makes sense that group involvement and cooperation businesses are significant in farming management because they support and strengthen public accounting systems and serve as a bridge between citizens.

Participation in the agriculture industry and its progress are both dependent on quick access to funding. However, this industry confronts funding limitations as a result of India's underdeveloped agriculture financing systems. In order to reduce credit restrictions, this article demonstrates that improved efficiency in agricultural financial markets is one of the key factors in agricultural governance. Government measures that enhance financial systems and make it easier for farmers to access financial markets are necessary to accomplish this aim. As the primary means of subsistence for 2.5 billion people worldwide, agricultural output is crucial, yet progress in increasing agricultural productivity has come to a standstill. Major grain yields increase by roughly 1% year, which is less than the population growth rate.

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