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BCG model knowledge and ESG knowledge leading to food security management of agriculturists in Maha Sarakham Province

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ABSTRACT

The populations were agriculturists of Maha Sarakham Province in the year 2022. The Simple Random Sampling technique was employed to gather 400 agriculturists. The research instrument was a questionnaire, and it was used for data collection. Multiple Regression Analysis is an inferential statistic for data analysis. Descriptive statistics were mean, and standard deviation. The purpose of the research was to forecast the BCG Model knowledge and ESG knowledge leading to food security management of agriculturists in Maha Sarakham Province. The results demonstrated that the prediction equation of the relationship between independent variables of Bioeconomy (X1), Green economy (X3), Environment dimension (X4), Social dimension (X5), and Governance dimension (X6) leading dependent variable Food Security Management of agriculturists. The Green economy (X3) explained the most effect on Food Security Management (Y) of agriculturists with 40.40 percent with statistical significance at a level of 0.01. Subsequences were Environment dimension (X4) at 33.40 percent, Social dimension (X5) at 29.80 percent, Governance dimension (X6) at 25.60 percent, and Bioeconomy (X1) at 14.50 percent. Except for Circular economy (X2) with a negative direction of 14.20 percent and a non-statistical significance level of 0.05. Nonetheless, the other variables also lead to effective food security management of agriculturists. To manage food security, agriculturists are required to have actual bioeconomy, circular economy and green economy knowledge, and a clear understanding of ESG concepts in all aspects of environment, social, and governance dimensions, thus they can manage food security for themselves and their families.

Keywords: BCG model knowledge, ESG knowledge, leading, food security management, agriculturist.

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INTRODUCTION

BCG model comprises of bioeconomy, circular economy and green economy. Bioeconomy aims to create added value for biological resources. It is an economy that brings knowledge and innovation. Especially biological sciences assist to develop further. Agricultural products into goods and services that can be used in various fields such as agriculture and food, health, medicine and energy with a balance between economic, social and environmental (United Nations,1987). The concept of sustainable development is named after the Brundtland report, which reported sustainable consumption in developed countries. Sustainable development is based on three fundamental pillars: social, economic, and environmental. The Brundtland report was required to implement strategies to prevent environmental degradation, and how environmental limits impact energy efficiency, the global economy, economic resources, and overall sustainable industrialization and development bade on social security. Finally, it resulted in 17 goals (Sustainable Development Goals: SDGs) (United Nations, 2012; United Nations, 2015; United Nations, 2021). A circular economy (CE) is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products for as long as

possible. CE aims to tackle global challenges such as climate change, waste, biodiversity loss, and pollution by emphasizing the design base. Moreover, CE is an important part of slowing climate change by addressing the climate crisis, and material recovery has an important role to play. The United Nations' International Resource Panel concluded that natural resource extraction and processing contribute to about half of all global greenhouse gas emissions (Lhaophet et al., 2016; EPA, 2023). Green economy (GE), a green economy is recognized as low carbon, climate change alleviation, resource efficiency, and social security. GE should be introduced in employment and income growth that is driven by public and private investment that enters such economic activities, infrastructure, and assets to reduce carbon emissions and pollution, enhance energy and resource efficiency consumption and prevention of the loss of biodiversity (UNEP, 2023; Limsuwan et al., 2021; Kaewhao, 2020; Mukpradab et al, 2015; Mukpradab et al., 2016). The Green Economy (GE) is paying attention more and more across the world while the global monetary crisis in B.E.2008 and it dramatically increase climate change due to the growth of human economic activity that the vast fossil fuel still be exploited in industrial expansion. This makes green economics recognized as the best choice for business and industry implementation to accomplish sustainable development in United Nations Conference on Sustainable Development (UNCSD) in B.E. 2012 (Atkisson, 2012; Kaewhao, 2020; Limsuwan et al., 2021).

As the green economy (GE) factor as in the guidelines of UNDP (2017), is intimately correlated with ecological economics and an economy for decreasing environmental negative impact and ecological shortages with the purpose of sustainable development with the environment and natural resources conservation, so it needs the green policies, green action plan, green projects, and green activities for implementing with certain green evaluation and monitoring process integration. To achieve sustainable development goals, the global action plans aim to end poverty, combat climate, change and protect the environment. Hence, UNDP (2017) and Thiengkamol (2007) confirm that the green economy is a system of economic activities involving the production, distribution, and consumption of goods. and services resulting in the improvement of human well-being over a long time with the proper green policy formulation, and green action plan with effective projects and activities for all sectors in private and governmental organizations while reducing the significant environmental risks and ecological scarcities (Kaewhao, 2020; Limsuwan et al., 2021).

ESG concept measures the business integrating environmental, social, and governance practices into companies that decrease environmental impact, social stability, and organization governance. Thus, three com ponents that makeup ESG are environmental, social and governance (Doppelt, 2017; CFA, 2018).

Environment, social and governance (ESG) is a framework used to evaluate an organization's business practices and performance on various sustainability and ethical issues. It also keeps a way to measure business risks and opportunities in those areas. In capital markets, some investors use ESG criteria to evaluate companies and aid to verify their investment plans, a practice known as ESG investment (Doppelt, 2017; CFA, 2018; ASCO, 2023). However, sustainable environment, ethics and corporate governance are normally reflected to be non-financial performance indicators, the role of an ESG program is to guarantee responsibility and the application of systems and processes to organize a company's impact, such as its carbon footprint, energy conservation, and the way it treats employees, dealers, suppliers, and shareholders. ESG enterprises also add to broader business sustainability attempts that purpose to pose companies for long-term success based on accountable corporate management and business strategies (Tippalert et al., 2015; Mukpradab et al., 2015; Mukpradab et al., 2016; Doppelt, 2017; CFA, 2018).

Environmental factors engage issues of an organization's overall impact on the environment and the potential risks and opportunities. It faces because of environmental issues, such as climate change, and environmental and natural resources conservation. Environmental factors that can be ESG criteria include energy efficient consumption, carbon footprint, greenhouse gas emissions, air and water pollution, biodiversity loss, deforestation, natural resource depletion, and waste management (Pimdee et al., 2012a; Kotchachote et al, 2013a; Saisunantharom et al., 2013a; Srikaewtoom et al., 2014; Kamin et al., 2014; Lhaophet et al., 2016). Social factors direct how an organization treats distinctive groups of people such as employees, suppliers, customers, community, and stakeholders. The criteria used cover fair pay for employees with a living wage, diversity, equity, employee experience and engagement, workplace health and safety, data protection and privacy policies, and fair treatment of customers, detailers, suppliers and stakeholders. Moreover, community relations based on the organization's correlation to and effect on the local communities in which it functions and operations including financing of projects that facilitate poor and underserved communities and sustenance for human rights and labor standards (Thiengkamol, 2011e; Doppelt, 2017; CFA, 2018). Governance factors explore how an organization's policies focus on internal controls and practices to sustain compliance with rules and regulations, best practices and organization policies including board composition, executive compensation policies, diversity and structure, leadership, and management, Additionally, financial transparency and business integrity, regulatory compliance, ethical business practices, risk management initiatives and avoid corruption, bribery, conflicts of interest, and political donations and lobbying (Thiengkamol, 2007; Doppelt, 2017; CFA, 2018).

Food Security has divided the elements of food security into 4 areas includes 1) food availability refers to having sufficient amounts of food regularly, 2) food access refers to having sufficient resources to obtain food, 3) food utilization refers to understanding and being able to appropriately use food and being able to hygienically cook food, and 4) food stability refers to access to adequate food at all times (FAO, 2006; Thiengkamol, 2009; Thiengkamol, 2012; Praneetham, and Leekancha, 2015). In 2019, the world's population surpassed 2 billion. food insecurity accounts for about 25.9 percent of the world's population. The proportion of the world's population facing food insecurity has been steadily increasing since 2014 except for North America and Europe, Asia has the largest population facing food insecurity with one billion people. However, Africa has the highest proportion of people facing food insecurity at 51.6 percent of the region's population, while Asia's share is around 22.4 percent. The factors affecting food security are not only poverty. Thus, poverty is a major cause of households' lack of access to adequate food (United Nations, 2023). There may be risks of facing food insecurity due to 1) The rapid increase in the world's population, 2) Global warming that directly affects the decline of farmland, 3) Water scarcity is an important input in agriculture, 4) Growing shortage of agricultural workers, and 5) Consumption habits that contribute to food loss and food waste (FAO, 2006; United Nations, 2023).

Furthermore, other considerations affect food security, such as reduced farmland from the expansion of urban areas. The problem of soil degradation caused by excessive farming, as well as the market dominance of large companies in the agro-industry, has led to restrictions on smallholder farmers in the production and sale of agricultural products (Thiengkamol, 2012; Thiengkamol, 2020; Kaewhao, 2022). The price of agricultural products is determined by the big companies. Moreover, having only a few large companies control an excessive proportion of food production poses a risk to food security. If a large company refuses to send food to certain regions or experiences difficulties in the production process, the company will not be able to support the food to market. Besides, the COVID-19 pandemic affected global food security. The COVID-19 pandemic has resulted in governments around the world restricting international or intercity travel, which has resulted in restrictions on the transportation of goods (land, water and air transport), labor mobility, and restricted international trade policies. Following the COVID-19 outbreak in March 2020, major export countries such as the United States, Germany, the United Kingdom, China, and the Netherlands have been affected. All cross-border travel control measures have been implemented. This affects the food exports of these countries to the world food market. The movement of workers between countries restricted by cross-border travel restrictions has also caused labor shortages in the agricultural sector. In addition, the economic crisis caused by the COVID-19 pandemic resulted in the closure of food production facilities. This also resulted in the closure of food factories. The countries that will be affected and vulnerable to food insecurity during the pandemic include those that are unable to produce enough food to meet the needs of their people and rely on foreign food imports. Especially poor countries or small island countries that have lost their main income from disrupted tourism. The food industry's supply chain, disrupted by covid-19 containment measures, will further pressure global food prices, with FAO's Food Price Index rising steadily since June and hitting a three-year high in December 2020. In the second half of 2020, food prices increased by vegetable oils, grain crops, and dairy products, while meat prices declined. At the same time, Thailand still has an increasing proportion of the malnourished population, which may reflect that Thailand is facing inequality in access to adequate and diverse nutrients. Tackling inequality in Thailand's access to adequate nutrients may start with government policies that will help reduce inequality in food access for Thai people, such as encouraging farmers to produce and maintain food diversity for consumers. Encourage people to have a better understanding of nutrition, this includes measures to help support the income of low-income households who are more vulnerable to food insecurity than other households.

According to the Food and Agriculture Organization (FAO), the definition of food security is a state that can be accessed by all people at all times to have enough food for an active and healthy life. Food security includes at a minimum: 1) ready availability of nutritionally adequate and safe foods, and 2) an assured ability to acquire acceptable foods in socially acceptable ways including, physical and economic access, at all times, to be the sufficient, safe and nutritious food to meet the dietary needs and the food preferences for active and healthy life (FAO, 2006: Pongsrihadulchai et al., 2013; Praneetham, and Leekancha, 2015). In rural areas, there is a tendency for food vulnerability. In agricultural households, food security is a condition in which all residents can obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes a community's self-reliance and social justice.

Food security has become a global problem. In the first decade of the 21st-century global food insecurity situation is becoming more severe. The world food situation is found to be an extreme issue because food insecurity causes increased mortality, health impacts, disease, disability, and enormous reduction in human capability. (Nelson et al., 2010; Thiengkamol, 2012; Renliang, 2013; Keawhao, 2022). Therefore, the world will require to produce more food in order to decrease inadequate and insufficient food in the world's population (Thiengkamol, 2009; Beddington et al., 2011). Generally, there are different important elements to accomplish food security for people. The four dimensions of food security can be identified as food availability (enough, production, distribution and

exchange), food access (affordability, allocation and preference), food utilization (nutritional and societal values and safety), and food stability (availability and access dimensions of food security) (FAO, 2006; Thiengkamol, 2011f).

Farmers are those who do agriculture and plant crops. Farming livestock and fisheries to produce food, raw materials, natural fibers, and other products that can be used for both consumption and consumption. It is an independent profession that does not need to depend directly on any agency. They can manage time and plan work by themselves. Agriculture is mostly dependent on natural factors quite a lot because they depend on the weather to help plants grow. In addition, there must be knowledge and understanding of the nature of plants and animals. It is able to take care of the yield to efficiently grow. Many of these are knowledge gained from experience or from telling from experts, such as planting a line of trees to help shield the wind and planting a mix to support each other, etc. Sometimes, it takes trial and error and learning to adapt. Because each person's area conditions are different. Thailand has a deep root in agriculture with the environment, terrain, and climate, making the country suitable for cultivation. Thai people have been involved in agriculture since ancient times until now. Agricultural products are also the main export products that generate income for many countries in the equator zone. Furthermore, the new generation who are farmers also has the application of technology together with marketing skills, design skills, and communication to make products and farming styles begin to change with the times.

The agriculture sector in Thailand employs around 30 percent of the total labor force covering 6.4 million households. However, it also generates the lowest value added per worker with the slowest growth relative to other economic sectors, as its contribution to national income has declined over the past three decades accounting for only 10 percent of GDP in 2019. The many problems that afflict the sector include poverty, debt, aging, land ownership and access to water resources, the small size of farms, and a limited farming portfolio (Udomkerdmongkol, 2023).

Agriculture encompasses crop and livestock production, aquaculture, fisheries and forestry for food and non-food products. Agriculture was the key development in the rise of sedentary human civilization, whereby farming of domesticated species created food surpluses that enabled people to live in cities. While humans started gathering grains at least 105,000 years ago, emerging farmers only began planting them around 11,500 years ago. Sheep, goats, pigs, and cattle were domesticated around 10,000 years ago. Plants were independently cultivated in at least 11 regions of the world. In the twentieth century, industrial agriculture based on large-scale monocultures came to dominate agricultural output (Food and Agriculture Organization of the United Nations, 2021; Wikipedia, 2023).

Consequently, this research will provide the guideline for local and national governments to pay attention to food security management by integrating BCG Model knowledge and ESG concept led to food security management of agriculturists in Maha Sarakham Province.

Research purpose

The purpose of this research was to predict the influence of BCG model knowledge and ESG knowledge leading to food security management of agriculturists in Maha Sarakham Province.

METHODOLOGY

Population and sample

The population were agriculturists in Maha Sarakham Province. There were 176,398 agricultural households in the fiscal year of 2021 (Office of Agriculture of Maha Sarakham Province, 2022). The simple random sampling technique was used for sample collect collection. The samples were 399 heads of agricultural households from Maha Sarakham Province, Northeastern in Thailand. The size of the sample was calculated by Taro Yamane Formula $n = N / (1 + Ne^2)$. The sample size was 399 at least with a confidence interval of 95% with 5% error (Yamane, 1973). In this study, 400 agriculturists who are the heads of agricultural households were collected as a sample group.

Research instrument

The questionnaire was a research instrument with 75 items, and it was used for data collection. The content and structural validity were determined by Item Objective Congruent (IOC) by 5 experts in the aspects of environmental study and environmental management scholar, food security management, and social science research. The accepted content validity value was more than 0.5. The 5-rating scale of Likert's scale was used for each item evaluation by starting from 1 as strongly disagree to 5 as strongly agree (Likert, 1932). There are 7 items for each issue of bioeconomy, circular economy, green economy, environment dimension social dimension, governance dimension, food availability, food access, food utilization, and food stability. The reliability was determined by Cronbach's correlation and the accepted level was 0.935 and higher than 0.7 (Hair et al., 2010; Thiengkamol, 2016).

Statistical analysis

Descriptive statistics was employed for mean and

standard deviation explanation and inferential statistics as multiple regression analysis was used for data analysis for leading association BCG model knowledge and ESG knowledge leading to food security management of agriculturists in Maha Sarakham Province.

RESULTS

Demographic characteristics of sample group

The finding revealed that the demographic characteristics of agriculturists, most of them are 242 males (60.50%), work experience of more than 3 years (235 people, 58.75%), married status (322 people, 80.50%), most of them graduated from primary school (310 people, 77.50%), and live in the rural area (365 people, 91.25%).

BCG model knowledge

BCG model knowledge includes bioeconomy, circular economy and green economy. The results are presented in Table 1. The agriculturist in Maha Sarakham Province had BCG model knowledge in the aspect of the green economy at the highest level with a mean of 4.36. Subsequences were bioeconomy with a mean of 4.31, and circular economy environmental damage with a mean of 4.21.

Table 1. Mean and standard deviation of BCG model knowledge.

BCG model knowledge	Mean	Standard deviation
Bioeconomy	4.31	1.44
Circular economy	4.21	1.36
Green economy	4.36	1.74
Total	4.28	1.66

ESG knowledge

ESG Knowledge refers to the environmental perspective, social perspective, and governance perspective. The results are presented in Table 2. The agriculturists of Maha Sarakham Province had ESG knowledge in the aspect of environmental dimension at the highest level with a mean of 4.35. Subsequences were the governance dimension with a mean of 4.33, and the social dimension with a mean of 4.29.

Table 2. Mean and standard deviation of ESG knowledge.

ESG knowledge	Mean	Standard deviation
Environmental dimension	4.35	1.67
Social dimension	4.29	1.76
Governance dimension	4.33	1.66
Total	4.32	1.75

Food security management

Food security management comprises food availability, food access, food utilization, and food stability. The results are presented in Table 3. The agriculturists of Maha Sarakham Province had food security management in the aspect of food availability at the highest level with a mean of 4.35. Subsequences were food access with a mean of 4.30, food stability with a mean of 4.29, and food utilization with a mean of 4.28.

Table 3. Mean and standard deviation of food security management.

Food security management	Mean	Standard deviation
Food availability	4.35	1.64
Food access	430	1.65
Food utilization	4.28	1.72
Food stability	4.29	1.75
Total	4.31	1.73

Multiple analyses of the correlation of BCG model knowledge and ESG knowledge toward food security management

The relationship between independent variables of BCG model knowledge and ESG knowledge causing dependent variable of Sustainable Development Perspective of the agriculturist in Maha Sarakham Province is presented in Tables 4 and 5.

As shown in Table 4, Multiple Linear Regression was analyzed between independent variables of Bioeconomy (X1), Circular economy (X2), Green economy (X3), Environment dimension (X4), Social dimension (X5), and Governance dimension (X6) leading dependent variable Food Security Management. It demonstrated that the regression coefficient equaled 0.755 (75.50%) and the coefficient of R Square was 0.709 (70.90%) with statistical significance at a level of 0.01. After it was adjusted, the coefficient of R Square with the power of prediction was 0.688 (68.80%).

Table 4. Result analysis prediction power of BCG model knowledge and ESG knowledge leading food security management.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.723	0.709	0.688	0.165

a: Predictors: Constant, Bioeconomy, Circular economy, Green economy, Environment dimension, Social dimension, and Governance dimension
b: Dependent Variable: Food Security Management

As shown in Table 5, Multiple Linear Regression was analyzed between independent variables of Bioeconomy (X1), Circular economy (X2), Green economy (X3), Environment dimension (X4), Social dimension (X5), and Governance dimension (X6) leading dependent variable Food Security Management of agriculturists. It demonstrated that the variance value of the F-test: Variance Ratio Test was conducted, and the value is 233.561 with statistically significant at 0.01.

Table 5. Multiple linear regression analysis between BCG model knowledge and environmental knowledge causing sustainable development perspective.

Model		Sum of Squares	df	Mean square	F	Sig.
	Regression	44.736	6	7.456		
2	Residual	15.112	393	0.077	233.561	0.000**
	Total	59.848	399			

a: Predictors: Constant, Bioeconomy, Circular economy, Green economy, Environment dimension, Social dimension, and Governance dimension
b: Dependent Variable: Food Security Management

Table 6. Coefficients of independent variables causing food security management.

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
	Constant	0.066	0.173	-	0.233	0.122
	Bioeconomy (X1)	0.145	0.071	0.195	5.235	0.007**
	Circular economy (X2)	-0.142	0.067	-0.124	1.356	0.0712
3	Green economy (X3)	0.404	0.056	0.423	8.978	0.000**
	Environment dimension (X4)	0.334	0.071	0.351	10.656	0.000**
	Social dimension (X5)	0.298	0.065	0.336	9.343	0.000**
	Governance dimension (X6)	0.265	0.037	0.296	7.894	0.000**

a: Dependent Variable: Food Security Management.

As shown in Table 6, the linear regression equation demonstrated that independent variables of Bioeconomy (X1), Circular economy (X2), Green economy (X3), Environment dimension (X4), Social dimension (X5), and Governance dimension (X6) leading dependent variable Food Security Management of agriculturists, with statistical significance at the level of 0.01 for 5 aspects of independent variables of Bioeconomy (X1), Green economy (X3), Environment dimension (X4), Social dimension (X5), and Governance dimension (X6) can predict Food Security Management of agriculturists, except Circular economy (X2), was not able to predict Food Security Management. Thus, equation 1, was written as the following:

$$y = a + b1\times1 + b2x2 + b3x3 + b4x4 + b5x5 + b6x6 \quad (1)$$

When
y = Sustainable Development Perspective as Dependent Variable
a = constant value
b1 = Coefficient relation of Bioeconomy as Independent Variable
x1 = Bioeconomy as Independent Variable
b2 = Coefficient relation of Circular economy as Independent Variable
x2 = Circular economy as Independent Variable
b3 = Coefficient relation of Green economy as Independent Variable
x3 = Green economy as Independent Variable
b4 = Coefficient relation of Environment dimension as Independent Variable
x4 = Environment dimension as Independent Variable
b5 = Coefficient relation of Social dimension as Independent Variable
x5 = Social dimension as Independent Variable
b6 = Coefficient relation of Governance dimension as Independent Variable
x6 = Governance dimension as Independent Variable

Therefore, the prediction equation of the relationship between independent variables of Bioeconomy (X1), Green economy (X3), Environment dimension (X4), Social dimension (X5), and Governance dimension (X6) leading dependent variable Food Security Management of agriculturists. The Green economy (X3) explained the most effect on Food Security Management (Y) of agriculturists with 40.40 percent with statistical significance at a level of 0.01. Subsequences were the Environment dimension (X4) at 33.40 percent, Social dimension (X5) at 29.80 percent, Governance dimension (X6) at 25.60 percent, and Bioeconomy (X1) at 14.50 percent. Except for Circular economy (X2) with a negative direction of 14.20 percent and non-statistical significance at a level of 0.05 as shown in Equation 2.

Equation prediction in terms of the raw score was demonstrated as the following equation:

$$Y = 0.121 + 0.145X1 - 0.142X2 + 0.404X3 + 0.334X4 + 0.398X5 + 0.289X6 \quad (2)$$

Equation prediction in terms of the standard score was demonstrated as the following equation:.

$$Zr = 0.195X1 - 0.124X2 + 0.423X3 + 0.351X4 + 0.336X5 + 0.296X6 \quad (3)$$

DISCUSSION

The results illustrated that the Green economy (X3) leading dependent variable of Food Security Management (Y) of agriculturists with the highest effect of 40.40 percent with statistical significance at a level of 0.01. This indicated that the Green economy is a necessary factor for the Food Security Management of agriculturists. Consequently, agriculturists should apply this factor to highlight the intention of agriculturists to have the consciousness to fulfill food security management by achieving better management via ESG understanding by considering the issues of environment, social and governance dimensions integrating with BCG Model knowledge. The results are consistent with studies of Thiengkamol (2012), Limsuwan et al. (2021), Kaewhao (2020), Tippalert et al. (2015), Wongsueb et al. (2015), Mukpradab et al. (2016) and Sutthiphapa et al. (2016). Subsequently, Environment dimension (X4) at 33.40 percent, Social dimension (X5) at 29.80 percent, Governance dimension (X6) at 25.60 percent, and Bioeconomy (X1) at 14.50 percent. Except for Circular economy (X2) with a negative direction of 14.20 percent and no statistical significance at a level of 0.05, it goes along with the study of Bootrach et al. (2013a), Kamin et al. (2014) and Srikaewtoom et al. (2014). Nevertheless, the Environment dimension also plays another important factor in the Food Security Management of agriculturists with an effect of 33.40 percent. To manage the food security of agricultural families, there is a need to understand the situation of the food insecurity problem. Particularly, Thai agriculturists have faced various problems of poverty, debt, aging, land ownership and access to water resources, small size of farms, and limited farming portfolio and they are affected due to global warming with directly affects the decline of farmland, water scarcity, and shortage of agricultural workers, and consumption habits alteration. These impact environmental quality and quality of life. Therefore, agriculturists should understand all aspects of economic, environmental and social context, so they can prepare their economic BCG Model knowledge and ESG dimensions to meet food security management. However, this research demonstrated that the finding shows the 5 important factors of bioeconomy, green economy, environment dimension, social dimension, and governance dimension leading food security management of agriculturists.

Conclusion

The findings expressed that the Green economy (X3) leading dependent variable of Food Security Management of agriculturists with the highest effect of 40.40 percent. Moreover, bioeconomy, green economy, environment dimension, social dimension, and governance dimension leading dependent variable food security management of agriculturists. Therefore, if the agriculturists can manage food security properly for their families and community, this will lead to a change in the local people to participate in the environment and natural resources by acquiring knowledge and altering their behavior with complying with environmental law seriously. Finally, sustainable development will happen in the community and will support better life quality of local people as well.

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