

GASTRONOMY: AN ECONOMETRIC ANALYSIS AS A BUSINESS DRIVER

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Abstract: Gastronomy has evolved from being just sustenance to a human being's basic need into now, satisfying experiences and the soul. Its evolution has brought about new sectors, new products, and new partnerships. It has shifted from just a supporting sector of one of the world's strongest economic performers, tourism, to becoming a new separate sector, gastronomic tourism where there is a significant research gap in its context. The study conducted an econometric analysis on gastronomy as a business driver and proposed a gastronomic model. It further provided accounts on its viability as a tourism destination. Trend analysis was performed to evaluate, analyze, and describe its status vis a vis significant relationships and differences. Primary data covered the local gastronomic business providers' and tourists' surveys in Negros Island, Philippines, while the secondary data came from the tourist arrivals and tourist receipts from 1997-2017. The business providers comprised of restaurants, food entities, and food businesses and the selection of these respondents was based on a predetermined criteria established from the inputs of industry experts and tourism officers which included top cuisines – specific local dishes; top food items – specific “pasalubong” (a small gift usually food given to friends or relatives when returning from a trip) items; and top food destinations – particular restaurants. The gastronomic products were categorized into three main attributes; *Food*, *Beverage*, and *Culture*. Findings included *Food* was the primary motivator and business driver for business providers.

Keywords: Business Driver, Econometrics, Food, Gastronomy, Tourism

1. Introduction

1.1. Gastronomy

"Gastronomy is a scientific definition of all that relates to man as a feeding animal." was J.A Brillat-Savarin's argument in his book, *The Physiology of Taste* (1949). Gastronomy is defined in the dictionary as the practice or art of choosing, cooking, and eating good food. It is sometimes used interchangeably with the term "culinary" being both in the same context though technically, food is still the center of concentration for both.

Culinary and gastronomy are both complex subjects with broad perspectives, but one common component of both is food. Both terms are connected to food or preferably all about it. It only depends on ones' perspective on how to contextualize and operationalize the terms.

Gastronomy, culinary, and even cuisine could all refer to the study or the appreciation of food. And linking gastronomy to food would be an understatement, complex as it is, gastronomy is in everything and everywhere or so according to the following statement, “Gastronomy is a chapter of natural history, for the fact that it makes a classification of alimentary substances. Of physics, for it examines their properties and qualities. Of chemistry, from the various analysis and decomposition to which it subjects them. Of cookery, from the fact that it prepares food and makes it agreeable. Of commerce, from the fact that it purchases at as low a rate as possible what it consumes, and displays to the greatest advantage what it offers for sale. Lastly, it is a chapter of political economy, from the resources it furnishes the taxing power, and the means of exchange it substitutes between nations.” (Brillat-Savarin, 1825, p.24)

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1.2. *Gastronomy and Culture*

Gajic (2015) further cited that, at times, gastronomy is closely associated with culture as well, for it is incorporated in the new concept of cultural heritage. It is a representation of culture and identity. It includes all that is related to food, cooking, and cooking skills, in a broader context, it includes food culture, nutrition, and culinary art. Considering Cun's (2011) own affirmation on gastronomy as "the study of who we are through what we eat," and a holistic look at the role of food in the society, culture, economics, environment, art, and politics. Early records would always go back to the era of the Roman cuisine during the medieval times when basic methods of cooking were observed, from basic curing of meat to basic cooking with high temperature and eating with no utensils. The roots of gastronomy have evolved significantly with the influence of other cultures and cuisine and the development of complicated methods of cooking and a combination of ingredients.

1.3. *Gastronomy, Experience, and Tourism*

Experience today plays a more prominent role in man's existence, giving attention to its physical, social, and cultural attributes further contributes to the expansion of new motivations and the development of new products for the modern consumer. One of these is food, given that more than half of the tourist spending goes to food, eating after all is essential to man's very existence. Food's evolution from being a staple to being a form of creative recreation has and is providing tourism a new niche market; thus, the expansion and growth of the industry. Further, gastronomy does not only satisfy the basic need of the consumer, but it is correlated to a destination's, a region's, or even a country's heritage and culture. Its correlation per se could be utilized in the representation of such tourism product and identity and further contributes to the expanding perception of local and foreign tourists. As to the consideration of food being a universal language, it transcends race, ethnicity, sex, sexuality, age, and class. It also speaks of traditions, culture, and identity. It even calls people into the community. Aside from its intrinsic nature, food has evolved into something else. Far from its roots, food, or gastronomy has developed to be an emerging phenomenon and has become one of the significant tourism products and further contributes to economic growth (OECD, 2018).

Today's consumer culture has evolved to possess a higher level of awareness; awareness of its surroundings, the environment, modernization, technological advancements, and even up to the dietary requirements. Gone were the days that man was satisfied with the basic needs – food, shelter, and safety; man is in constant search for overall well-being and satisfaction; thus, the emergence of new preferences. This evolution of preferences poses as a multiplier to all industries and sectors.

Moreover, gastronomy, being an integral part of tourism (Gordin, Trabskaya and Zelenskaya, 2016), has also evolved from the chemical, molecular, and scientific processes into the incorporation of various food trends. From chemically-enhanced foods, molecular and technologically processed dishes, the trend in gastronomy made a 360-degree shift as observed; there is an increasing demand for more natural and environment-friendly gastronomic products. The priority of today's gastronomy aside from the culture behind the food is expanding the offerings of delicious, tasty, aromatic but healthy, low-to-none processed, organic and environment-friendly products (Organic Authority, n.d).

Several studies have been conducted focusing on gastronomy internationally and its contribution to the context of tourism, but there is a minimal number of studies done locally or even nationally, as evident in the scarcity of related studies. The Philippines, being an archipelago, exhibits quite several tourism sites, let alone the full sun, sea, and sand experience. The country does boast not only its pristine islands and breathtaking mountains but also its very colorful variety of cuisine. From the three main islands down to its specific regions, the country has a lot to offer. One of these islands is the Negros Island, which is the fourth largest island in the Philippines; it is one of the many islands comprising the Visayas. It is made up of two provinces; Negros Occidental, its capital is Bacolod City and Negros Oriental, its capital is Dumaguete City. The island is known for its widespread cultivation of sugarcane producing annually about 60% of the country's sugar output during the 1950s to the 1980s. The socio-economic

growth of the island spiraled down during 1985, and it was not until the end of 1987 that the overall economic situation took an upturn when agricultural diversification happened, more and more landowners invested in prawn farming, livestock and high-value crops.

The evolution of the Negrense culture revolved around sugar. Even up to now, alongside the modernity of today, one can still see large and numerous sugarcane plantations. Negrenses (the locals of the island) are known as affectionate, generous, and fun-loving people who enjoy the finer things in life. Negros Island is always mistaken as some paltry provincial town full of sugarcane, but there is more to it than sugarcane plantations, mills, and sugar. One of the major influences that the island had was from the Spaniards, from the different festivals (most of which are in honor of patron saints or for religious festivities) down to the lavish and grandiose mansions and food. Though it is known as "The Sugarbowl of the Philippines," Negros has a lot to offer. Numerous Spanish mansions are still existing in its cities and municipalities adding color to its very vibrant tourism sites and giving a glimpse of the island's cultural heritage. The island is also blessed with breathtaking beaches, diving sites, breathtaking mountains, and even an active volcano (Negros Occidental Archives, n.d).

However, what does Negros Island have to do with food when the country already has numerous regions boasting their respective cuisines as well? From the "Culinary Capital of the Philippines," Pampanga and its famous Kapampangan dishes to Ilocos Region's remarkable dishes; "pinakbet" and "dinengdeng" (both are vegetable dishes) and even down to Western, Eastern and Central Visayas' "batchoy" (noodle soup in beef or chicken stock with pork offal, crushed pork cracklings, and beef loins), "pansit molo" (pork dumpling soup) and Cebu "Lechon" (roasted pork). What makes the island different?

Negros Occidental's capital, Bacolod City, is known for its chicken "inasal" and "piaya." Chicken inasal or simply inasal is a Filipino version of roast chicken; it is marinated in a mixture of basically calamansi – a Philippine cultivated citrus, soy sauce, coconut vinegar, pepper, and annatto – a condiment from the seeds of achiote trees, it is then grilled in an open charcoal grill. It is served with rice, "sinamak"-coconut vinegar spiced with peppers, garlic and ginger, soy sauce and calamansi. While piaya is an unleavened flatbread filled with "muscovado" (a kind of sugar with a strong molasses content) and glucose syrup, this is only just one city that has a significant contribution to the growing culinary treasures of the country (Bacolod City Tourism, n.d).

Back in 2005, Negros Island had a signed agreement to protect the island's biodiversity, and it also initiated the goal to become "Negros Organic Island" and later with a vision to become the "Organic Food Bowl of Asia." (F&B Report, 2018). Though currently, there is no official memorandum declaring the title but several published articles have adopted such and is continuing to promote. There is an annual Negros Island Organic Farmers Festival which was first celebrated on July 15, 2006. This festival promotes all local organic produce and foods using these products as well.

With festivities like these, it is one medium to showcase the hidden treasures of a city's culture through food. The Negros Occidental Tourism Division reported a tourist arrival of 1,724,133 last 2017. There is no available data on the specific motivation for travel, neither an established specialized gastronomic or culinary tour, though there are food festivals like those mentioned above, the 2-year old Kaon Ta! (Let's Eat) Silay Food Festival of Silay City and the recently born Bacolod Chicken Inasal Festival, in addition to the increasing population of various restaurants and food offerings within the capital cities and not to mention the respective specialties of each municipality; little research, publications, representation, and analysis is conducted.

Though the cuisine of the country is stable and evident, there is no concrete exclusive "Philippine cuisine," what the country has is the evident Filipino cuisine with influences mainly from the Chinese and Spanish (Fernandez, 1988).

Alongside food's evolution to becoming a separate tourism product globally, the Philippines is slowly catching up to that trend. The growth of internationally acknowledged Filipino chefs and dishes are pieces of evidence that the country is indeed moving forward. The culinary atmosphere in the country

is made up of a combination of homegrown brands, international franchises, and infused Filipino offerings. With this population and market growth, it is quite evident that gastronomy or culinary has a very high potential in being not only mere support but be one of the primary motivations to travel as well and with this very same observation, this specific niche could be as well a great business driver.

With the impending changes in the tourism industry alongside its growth and consumer culture influences, this study assessed the status of gastronomy and further aimed to provide an econometric analysis of its viability as a business driver on the Island. Indicatively, the study provided accounts to the relationship of the following specific variables:

1. Key business drivers
 - a. Monthly Income from Operations (Income)
 - b. Average Sales from Operations (Sales)
 - c. Number of Employees (Human Resources)
2. The status of the gastronomic products
 - a. Food
 - b. Beverage
 - c. Culture

1.4. Econometric Analysis

Economic growth has been one of the significant subjects in researches and studies not only in the academe but in both public and private entities as well. There are several processes in conducting this researches. One of these is by econometrics, and it concerns itself with the application of mathematical statistics and the tools of statistical inference to the empirical measurement of relationships postulated by an underlying theory (Greene, 2012).

More so, it is the quantitative application of statistical and mathematical models using data to develop theories or test hypotheses in economics and forecast future trends from historical data. Economic theories are analyzed and quantified by relying on statistical inferences by leveraging tools like frequency distributions, probability and probability distributions, statistical inference, correlation analysis, simple and multiple regression analysis, simultaneous equations models, and time series methods (Investopedia, 2019).

2. Tables and Figures

The study conducted an econometric analysis using regression analysis, trend analysis, and correlation analysis that gave the direction for the gastronomic model.

Table 1: Linear Trend Results for Tourist Arrivals

	Unstandardized Beta Coefficients	t—statistics (p-value)	F-ratio	R-squared
Constant	576,054.114	3.949 (0.002)	43.678 (0.000)	0.878
Predictor : Trend Variable	106,038.736	6.909 (0.000)		

Table 1 provides the results of the linear trend model for Tourist Arrivals. The R-squared, which provides the measure for goodness of fit, relates that the element of time explained 87.8 % of the tourist arrivals in the region. The F-ratio provides a measure of the model’s overall significance. The F-ratio (43.678) generated a p-value (0.000), less than the level of significance of 0.05. This, in effect, relates that the entire linear trend model is significant.

The t-statistics provide a measure of the individual significance of the predictors. As observed, both the constant and the predictor generated t-statistics, with p-values less than the level of significance of 0.05. Hence, both predictors are considered significant.

The Beta coefficients provide the measure of the contribution of the constant and trend variable to the level of tourist arrivals. For the constant, the value of 576,054.114 signifies that such is the level of tourist arrivals, that is independent from the element of time. The beta coefficient for the predictor relates that on the average, the number of tourist arrivals increases by 106,038.736 every year. Further, the positive beta coefficient for tourist arrivals relates to an increasing trend in the last ten years.

Table 2: Linear Trend Results for Tourist Receipts

	Unstandardized Beta Coefficients	t—statistics (p-value)	F-ratio (p-value)	R-squared
Constant	-3,492,853,353.724	1.807 (0.094)	36.194 (0.000)	0.858
Predictor : Trend Variable	1,279,305,191.432	6.016 (0.000)		

Table 2 provides the results for the linear trend model for Tourist Receipts. The R-squared relates that the element of time explain 85.8 % of the tourist receipts in the region. The F-ratio (36.194) generated a p-value (0.000), less than the level of significance of 0.05. This, in effect, relates that the entire linear trend model is significant.

The t-statistics provides a measure of the individual significance of the predictors. As observed, both the constant and the predictor generated t-statistics, with p-values less than the level of significance of 0.05. Hence, both predictors are considered significant.

The Beta coefficients provide the measure of the contribution of the constant and trend variable to the level of tourist receipts. For the constant, the value of -3,492,853,353.724 signifies that such is the level of tourist receipts, independent from the element of time. The beta coefficient for the predictor relates that on the average, the number of tourist receipts increases by 1,279,305,191.432 every year. Further, the positive beta coefficient for tourist receipts relates to an increasing trend in the last ten years.

Table 3: Business Providers’ Perceptions : Summary of Correlation Results

		Overall Perception
Food	Pearson Correlation	.527*
	p-value	.003
	n	30

Notes: *Total Link Strength

Prior to formulating the model that can establish the relationship and model for the study, the study opted to subject the areas of evaluation for the Business Providers to Pearson Correlation. This was conducted to serve as an initial test to determine which variables are said to be significantly related. Results showed that the Business providers’ ratings for Food and their Overall Perception or Rating were significantly correlated. Results particularly showed a moderate and positive relationship between the two variables. Meanwhile, the remaining variables did not register any degree of significant correlation.

Table 4: Regression Results for Business Providers’ Perceptions: Food as the Predictor and Overall Perception as the Dependent Variable

	Unstandardized Beta Coefficient	t-statistics (p-value)	F-ratio (p-value)	R-squared
Constant	1.566	2.184 (0.037)	10.744 (0.000)	0.277
Predictor: Food	.552	3.278 (0.000)		

In Table 4, the value of the R-squared showed that the ratings on Food explain 27.7 % of the variations in the Business providers’ ratings for Overall Perception. The F-ratio (10.744) generated a p-value of 0.000, signifying that the regression model is significant. The t-statistics provide the test for the

individual significance of the constant and predictor. As observed, both t-statistic generated a p-value less than the level of significance of 0.05. Such signifies that both constant and the predictor are significant. Interpreting the beta coefficients relate the following:

The constant relates that 1.566 is the value of the Overall Perception that is independent from the rating on Food.

The beta coefficient for Food relates that a unit increase in the respondents' rating for Food, increases his / her Overall Perception by 0.552 units.

Table 5: Regression Results for Tourists Perceptions: Food as the Predictor and Overall Dining as the Dependent Variable

	Unstandardized Beta Coefficient	t-statistics (p-value)	F-ratio (p-value)	R-squared
Constant	2.642	21.098 (0.000)	20.8375 (0.000)	0.582
Predictor: Food Experience	0.437	14.278 (0.000)		

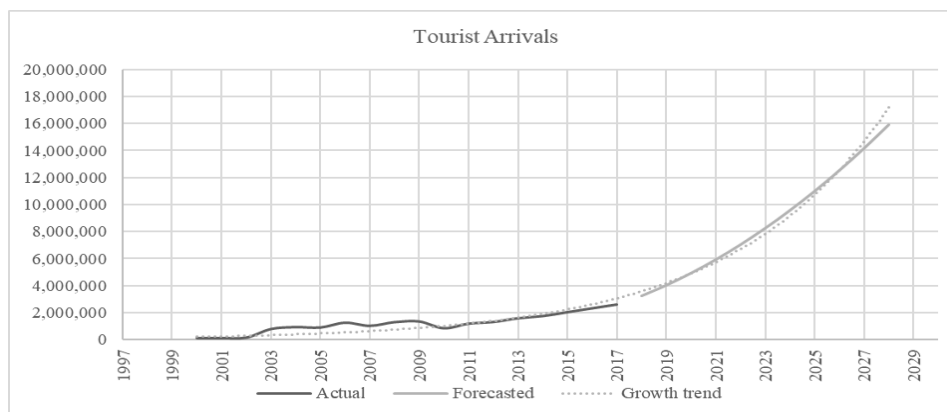
In Table 5, the regression results of the tourist respondents showed that the value of the R-squared showed that the ratings on Food explain more than half or 58.2% of the variations in the rating for Overall Dining Experience. The F-ratio (20.8375) generated a p-value of 0.000, signifying that the regression model is significant. The t-statistics provide the test for the individual significance of the constant and predictor. As observed, both t-statistic generated a p-value less than the level of significance of 0.05. Such signifies that both constant and the predictor are significant. Interpreting the beta coefficients relate the following:

The constant relates that 2.642 is the value of the Overall Dining Experience independent from the rating on Food.

The beta coefficient relates that a unit increase in the respondents' rating for Food, increases his / her rating on Overall Dining Experience by 0.437 units.

The study started with the trend analysis of the tourist arrivals and tourist receipts of Negros Island. To underscore the importance of this trend analysis, the authors made use of a predictive linear regression model to derive to the resulting trend models further exhibited in Eq. 1 and Eq. 2 respectively. The following figures show the actual, forecasted, and growth trend values of the tourist arrivals and tourist receipts in Negros Island using the predictive trend models.

Figure 1: Actual, Forecasted Number and Growth Trend of Tourist Arrivals in Negros Island



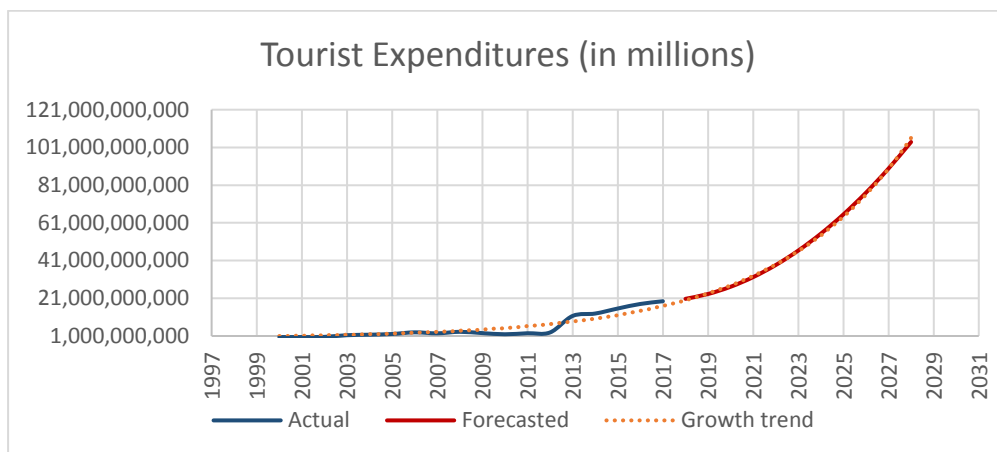
Based on the historical data gathered, the study forecasted the trend of the variables for the next ten years. Figure 1 showed that Tourist arrivals on the island increased by 13,335,152 million to 15,929,059 million tourists in 2028 from 2,593,907 million in 2017. The average year-on-year growth rate in tourist

arrivals from the year 2017 to 2028 is 18%. In the Asia Pacific Region, tourism has been recognized consistently as an essential source of inclusive economic growth (San Andres, Cheok and Othman, 2016). Moreover, tourist arrival is considered as one variable to evaluate the tourism performance of a destination. Having an increasing trend in tourist arrivals means a positive tourism performance, thus further contributing to economic growth.

Figure 2 exhibited the actual, forecasted, and growth trend values of the Tourist expenditures in Negros Island using the predictive trend model. Data shows that Tourist expenditures on the island increased by 84,434,412 million to 103,861,816 million in 2028 from 19,427,673 million in 2017. The average year-on-year growth rate in Tourist expenditures from the year 2017 to 2028 is 16%.

This connotes that an increasing growth trend in Tourist expenditures would mean a positive impact on the country's gross domestic product (GDP). Yalcinkaya, Dastan, and Karabulut (2018) presented that the role of tourist expenditures has an important impact on a country's economy. Together with other variables, it is evident that it has a positive and statistically significant effect on economic growth. Moreover, findings in their study indicated that the resultant increases in international tourism expenditures or receipts in selected countries in terms of the tourism-led growth hypothesis caused an increase in economic growth performance. Thus, it means that the island has a vast potential in tourism growth.

Figure 2: Actual, Forecasted Number and Growth Trend of Tourist Expenditures in Negros Island



3. Equations

The econometric analysis conducted and findings specifically from Tables 4 and 5 provided the direction of the model. After the definition and assessment of the current status of gastronomy in the Island; its significant relationships and differences, two predictive models were developed, one for the Business providers and one for the Tourist to understand their respective behavior.

$$y = a + bx \tag{1}$$

The general equation for the two models is summarized in Eq. 1 where;
 y is the Overall Perceptions of the Business providers; and
 is the Overall Dining Experience for the Tourists;
 a is the constant value of the Overall Rating of the Business providers; and
 is the constant value of the Overall Dining Experience for the Tourists;
 b is the predictor Food for both Business providers and Tourists; and
 x is for Food for the Business providers; and
 is for Food Experience for the Tourists.

The proposed gastronomic equation model for Business providers is further detailed in Eq. 2 while the proposed gastronomic equation model for Tourists in Eq. 3.

$$\text{Overall Perceptions} = 1.566 + 0.552 (\text{Food}) \quad (2)$$

$$\text{Overall Dining Experience} = 2.642 + 0.437 (\text{Food Experience}) \quad (3)$$

For the Business providers, there is a significant and positive relationship between Food and the Overall Perception. This further means, as previously discussed, that the overall perception and confidence in the gastronomy of the Business providers rely on their confidence in the Food offerings as well. The model exhibits that an increase in the rating of the Food also means an increase in the Overall Rating of gastronomy thus validating the potential of gastronomy as one of the tourism products. As long as the Business providers maintain their standing on their respective food offerings, the growth of gastronomy will also be maintained.

For the Tourists, however, the role of the Dining experience significantly affects their perceptions of Food. An increase in the former also means a significant increase in the latter. It further exhibits that the demand of gastronomy from the tourists' perception depends not on the actual food offerings but the non-food attributes it entails.

With the main objective of the study of providing an econometric analysis of gastronomy, the variables based on the results presented were significant to advance in the establishment of a framework that can be used in the development of the model. Several significant relationships were seen among the variables of the study; one was seen between the Business providers' average daily sales and the Overall rating or perception of gastronomy. Another positive relationship was seen between the Business providers' still Overall rating and Food and finally, a positive relationship was seen between the Tourists' Overall dining experience preconceptions and Food. Local business providers saw and confirmed the potential of gastronomy, with no significant differences in their perception and confidence in the gastronomy supply even after considering all their profiles. However, the same cannot be concluded on the tourists' perception; they, in general, are more focused on the dining experience rather than the actual product. Their ages technically defined that dining experience is prioritized rather than food, while those who are there to visit family and friends; Americans and Europeans prioritized food over dining experience.

4. Conclusion

It is concluded that there is an evident link between the most substantial performing sector of a country (tourism) and its supporting component (gastronomy/food). This link can develop into a new sector and expand the country's growth and further imbue resources for both sectors. With the continuing increasing trend of both tourist arrivals and tourist spending, the tourism performance of the locale is set to grow exponentially and impressively.

Negros Occidental and Negros Oriental, two of the Island's provinces have considerable potentials in becoming a gastronomic tourism destination as substantiated by its present status, especially on the Food attribute albeit an imperative consideration should be given to the Beverage attribute which also affected the Cultural attribute. The Overall status, however, still sufficed the claim.

In the economic context, business drivers like human resources, sales, and income are among the contributors to economic performance. A significant relationship exists between the island's gastronomy and the mentioned business driver. Further, the increase of these business drivers will result in an increase in gastronomy as well.

Local business providers saw and confirmed the potential of gastronomy, with no significant differences in their perception and confidence in the gastronomy supply even after considering all their profiles. However, the same cannot be concluded on the tourists' perception; they, in general, are more focused

on the dining experience rather than the actual product. Their ages technically defined that dining experience is prioritized rather than food, while those who are there to visit family and friends; Americans and Europeans prioritized food over dining experience.

Another significant relationship was seen between the perception of the gastronomy of the business providers and the Food sector further validating the confidence of the business providers with the Food offerings.

A significant relationship existed between the tourists' perception of food and the overall dining experience further validating that considerable importance is given to the dining experience.

Amidst the strength of the Food attribute, the Beverage attribute, however, did not compare with that similar level of strength. With this, the Culture attribute was affected as well. It can be seen as both a challenge and an opportunity for the local supply. Another challenge posed was the lack of coordination between the local government units. Finally, with the evidence the study presented, gastronomy is viable and has great potential to develop into a separate tourism sector.

With the results and findings of the study, the following recommendations are presented:

- a. Encourage the local supply to develop existing and new offerings into more sustainable products; and encourage more local gastronomic business providers that can exhibit the island's identity to cover more consumers and clientele.
- b. Encourage research and market analysis to strengthen the gastronomic offerings to further support the increasing growth of tourist arrivals and tourist expenditures.
- c. Tourism officers may be proactive in the research for new tourism products to aid in more environment-friendly operations. Further, they may incline their operations to be more "identity-driven" to promote the cultural branding of the locale.
- d. Constant gastronomic activities and festivities may be strongly advocated to incur and strengthen sales.
- e. Forging a strong partnership and network between the local supply and the local government units may be prioritized to solve the concurrent challenges and barriers being faced by the industry through appropriate guiding principles, formulation of standards and procedures, marketing and distribution of products, development of new offerings and accreditation.
- f. The study recommends a gastronomic model to significantly predict the behavior of the tourist and the local supply to aid in the market analysis and research in gearing up to the development of gastronomic tourism.
- g. Further research is strongly advocated on the area not covered by the study; the possible harmonization and shift to organic practices in gastronomy, another on the empirical definition of the cultural attribute of a locale; down to its actual specifics, e.g., preparation, history, service, and consumption.

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