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PHYSICAL ENDOWMENTS OF MARINDUQUE COCONUT INDUSTRY: BASIS FOR AN ECONOMIC STRATEGY

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Abstract: Coconut (Cocos nucifera L.) is one of the most beautiful, resilient and beneficial trees widely cultivated in tropical and sub-tropical countries. The coconut is a very useful plant with a wide range of products being sourced from it. The Philippines now ranks second to Indonesia among the top coconut producers in the world. Out of the 81 provinces in the country, sixty-eight (68) provinces are considered coconut- growing areas. Marinduque is one of the coconut-growing provinces, however, not so much is known about the status of this industry in the province. An understanding of the coconut attributes and a condition strongly justifies the judicious management of the current stands of coconut trees. This study sought to establish the status of the physical endowments of the coconut industry in the province of Marinduque specifically in terms of natural resources, geographical location, population, and land area. The survey research was used to gather the information from coconut farmers who are members of cooperatives in the province of Marinduque with the use of questionnaire. The study revealed that the over-all physical endowments of the coconut industry in the province are perceived to be good.
However, some interventions need to be implemented and decision-makers have to aggressively pursue recommended measures.

Keywords: Marinduque, Physical Endowments, Coconut Industry

1. INTRODUCTION/BACKGROUND

Coconut (Cocos nucifera L.) is one of the most beautiful, resilient and beneficial trees widely cultivated in tropical and sub-tropical countries. It is grown in more than 90 countries, with world production concentrated in Asia and the Pacific, on island and coastal areas, as well as in the humid tropics, such as the Philippines (Burton, 2018). The Philippines, Indonesia, India, Sri Lanka, Thailand, Malaysia, and Papua New Guinea together account for about 80% of the total area planted to coconuts worldwide. (Pham, 2016)

The coconut is a very useful plant with a wide range of products being sourced from it. Coconut products are used to make everything from clothing to animal feed to beauty creams. Its kernel is harvested for its edible flesh and delicious water, while its husk is used for its strong fibers. Coconut oil is the dominant product of the coconut. It is extracted, processed, and marketed for culinary, medicinal, and cosmetic uses alike. Typically, the flesh is first dried down to 6% moisture to make copra. This product is then hauled to factories across the world where it is manufactured into oil.

World coconut oil production has been increasing for the past decade because of greater global demand for its important characteristics. It is the source of medium chain triglycerides (MCTs) which, research has shown, possess unique properties with important nutritional and medical applications, including

Virgin coconut oil, the coco methyl ester (CME) for biofuels or as biolubricants and the use in cosmeceuticals. Lauric acid (C12) from coconut oil is also known to possess a potent antimicrobial activity and was found to reduce the HIV virus. (Pham, 2016)

The coconuts' amazing levels of resilience enable them to grow in a wide variety of soils, although they require a relatively high amount of rainfall (Burton, 2018). Just like forest trees, coconut palm trees have a significant carbon storage (sink) capability estimated at 196.75 t C/ha (722 t carbon dioxide (CO2), and with C sequestration rate of 4.78t C/ha/yr (17.54 t CO2), being a woody perennial cropped-plant. This strength of the coconut tree should be significant in mitigating the negative or unwanted impacts of climate change. (UCAP 2007)

The Philippines ranks second among the top coconut producers in the world. It was previously the world's largest producer before being overtaken by Indonesia. Luzon, Southern Mindanao, and the Eastern Visayas are a few of the country's most prominent locations for coconut producing. It is estimated that around one quarter of total farm land in the Philippines is dedicated to coconut production. Other top coconut producers include India, Brazil and Sri Lanka. It is common among these countries that many of their coconuts produced are exported overseas and coconut production is very important to their agricultural industry and their economy as a whole, especially in rural areas of the country. The warm and sunny climate of these countries is ideal for coconut growth.

Coconut-growing is a leading industry in the Philippines. Statistics indicated that areas planted with coconut covers 3,612,300 hectares equivalent to 26% of the country's total agricultural land (Pascua et al, 2018; Selected Statistics on Agriculture 2018, Philippine Statistics Authority; Dar, 2017). In 2017, the volume of production is at 14,049,100 mt. The value of production in 2017 reached Php120,336,300,000 (Selected Statistics on Agriculture 2018, Philippine Statistics Authority). In a newspaper article, Dar (2017) wrote that the coconut lands host about 3.4 million farmers who live mostly below the poverty level despite coconut exports reaching $2.0 billion in 2016.

Additionally, in 2017, coconut oil ranks 1 among the Philippines' top agricultural exports with a volume of 983,590 mt and desiccated coconut ranks 5 with a volume of 116,080 mt. The value of these top exports amount to 1,614.77 and 340.83 (FOB in million US$) respectively. PSA also enumerated major countries where coconut oil is exported which include Netherlands, USA, China, Japan and Italy. The Philippines also exports desiccated coconut to the USA, Netherlands, Australia, Canada, and the United Kingdom. (Selected Statistics on Agriculture 2018, Philippine Statistics Authority)

Of the 81 provinces in the country, sixty-eight (68) are considered coconut-growing areas, representing 1,195 coconut-growing municipalities (Pascua et al, 2018). Marinduque is one of the 68 coconut-growing provinces. In the light of these developments, the social, environmental and economic benefits from the planting and growing of coconut palm trees is further significantly enhanced and should be one of the priorities in the rural and economic development of the country. An understanding of the coconut attributes and conditions strongly justifies the judicious management of the current stands of coconut trees. The fundamental economic goal for any region should be to attain and sustain a high and rising standard of living for its citizens (Berkshires Strategy Project, 2006). A region's standard of living is determined by the productivity of its economy. Economic productivity is anchored on the judicious use of endowments.

This study conforms to the national government's thrust for poverty alleviation and to the provisions of the Sustainable Development Goals like:

1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.

2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal

access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

2. STATEMENT OF THE PROBLEM

The study endeavored to establish the status of the physical endowments of coconut industry in the province of Marinduque based on the perception of stakeholders.

Specifically, the study sought to establish the status of these physical endowments in terms of:

1. natural resources
2. geographical location
3. population (labor/human resource), and
4. land area

The study, likewise, proposed interventions in the use of the endowments to help boost productivity.

3. METHODOLOGY

The projected model in this study begins by looking into the physical endowments of the province which includes the natural resources, geographical location, population, and land area. These endowments provide the foundation for prosperity that arises from productivity in the use of these endowments.

The Survey Research was used to gather the information from groups of people by selecting and studying samples chosen from a population. Since the research focused on the physical endowments in relation to the coconut industry, the researcher found it proper to consider the coconut farmers as respondents of the research survey since they are deemed knowledgeable about the status of the physical endowments in their respective areas. And to have better focus, the researcher further considered coconut farmers who are members of cooperatives as respondents. The researcher initiated collaboration with the Cooperative Development Authority to facilitate data gathering.

Using the Slovin's formula with 95% confidence level and 5% margin of error of computing for the sample population of respondents, the researcher has arrived at the sample size of 230 respondents. The researcher gathered data using the validated survey instrument. Questionnaires were distributed to various coconut farmers' cooperatives upon the endorsement of the CDA Officer of the province. Survey instruments were retrieved and interpreted. Data interpretation used the SPSS application/program.

A structured questionnaire was the main technique used to collect primary data from the target respondents. To measure the variables used in this study a Likert scale was applied as a measurement scale. The questionnaire solicited the perception of respondents on the status of the physical endowments with ordinal scale ranging from 1 (poor) to 5 (excellent) with the neutral point of 3 (good).

RESULTS AND DISCUSSIONS

Table 1. Physical Endowments in terms of Natural Resources

Natural Resources	WM	VD
1. Presence of landforms like mountains and hills	3.5	Very Good
2. Number of coconut trees planted	3.4	Good
3. Tourism destination potential	3.4	Good
4. Lands covered with forest growth is 67 hectares	3.2	Good
5. Presence of mineral resources	2.7	Good
6. Status of water resources	2.6	Good
AWM	3.1	Good

Table 1 shows the Physical Endowments in terms of Natural Resources. Findings show that the Presence of landforms like mountains and hills got the highest wm of 3.5 with the vd of Very Good, while the status of water resources got the lowest wm of 2.6 with the vd of Good.

Countries are endowed with land resources of various forms. In the Philippines, the landforms include mountains, volcanoes, hills, plateaus and valleys. Land resources provide for many human needs and for the essential needs for life and serve as the building blocks for development. Some benefits we derive from land

resources include: food production as one of the energy sources; habitat for animals to maintain natural processes and biodiversity; regulation of climatic, hydrological and biochemical cycles and biological processes; provides space and a suitable substrate for residential, settlements, cultivation, energy conversion, recreation, tourism, nature protection and a holistic spatial system in which human interact with their environment. (Obstaculo, Paolo Z. 2014)

Table 2. Physical Endowments in terms of Geographic Location

Geographical Location	WM	VD
1. Marinduque is an island province	4.1	Very Good
6. The island has two major seasons—dry and rainy	3.8	Very Good
3. The province is accessible by sea transport	3.6	Very Good
4. Availability of land transportation in the province	3.2	Good
5. Sea ports are operational in various municipalities	3.2	Good
2. The province is accessible by air transport	3.1	Good
AWM	3.5	Very Good

Table 2 shows the Physical Endowments in terms of Geographic Location. Findings show that the Marinduque is an island province got the highest wm of 4.1 with the vd of Very Good, while the province is accessible by air transport got the lowest wm of 3.1 with the vd of Good. This is the perceived outcome since respondents are aware that while the province is an island it could be easily accessible by several means. The province could be reached by water using the services of two shipping companies, Montenegro Lines and Star Horse Shipping Lines, plying the sea routes from Dalahican Pier in Barangay Talao-Talao in Lucena City to Marinduque via Balanacan Port in Mogpog. JAC Liner Inc. serves a direct bus route from Cubao in Quezon City to Marinduque via rollon/roll-off ship (https://pia.gov.ph/ downloaded March 18, 2019). Marinduque could also now be reached by air. Air transport has recently resumed operations. The airport is located in Barangay Masiga, roughly between Gasan and Boac. Respondents, however, are used to travel by sea.

Table 3. Physical Endowments in terms of Population

Population	WM	VD
3. 58% of the population belong to age bracket 15 – 64	3.4	Good
4. The number of gainfully employed individuals	3.3	Good
5. Organized cooperative farmers	3.2	Good
1. The population density of 248 per square kilometer	3.2	Good
2. The literacy rate of 99.2% in the province	3.1	Good
6. Women are empowered	3.0	Good
AWM	3.2	Good

Table 3 shows the Physical Endowments in terms of Population. Findings show that the 58% of the population belong to age bracket 15 – 64 got the highest wm of 3.4 with the vd of Good, while the Women are empowered got the lowest wm of 3.0 with the vd of Good. More than half of the population of the province is within the labor force age which coincides to the claim that expanded work forces can help nations increase their economic output, raising living standards for everyone (Human Population Dynamics). This is further related to the discussion of https://www.quora.com/Which-country-has- thehttps://www.quora.com/Which-country-has-thebest-geographical-advantagebest-geographical- advantage on demographic advantages in terms of a young, dynamic and well-trained population due to high percentage of the population under age 34, an average age of 28 and a big number of university graduates every year and a great number of the population is actively employed.

Furthermore, in relation to the theory of economic growth, the investment in human resources becomes more important in its development role. Quality human resources for developing countries are an important factor in efforts. (Yoyok Hendarso, Zulfikri Suleman, Supriyanto Supriyanto and Maulana Ali)

Table 4. Physical Endowments in terms of Land Area

Land Area		WM	VD
6.	Sufficiency of agriculture area	3.7	Very Good
4.	Unique topography as an island ecology	3.5	Very Good
3.	Soil suitability to coconut farming	3.5	Very Good
5.	Area for expansion of coconut farming	3.4	Very Good
1.	The province has a land area of 959.25 sq. km.	3.4	Good
2.	Area planted with coconut is at 35,455 hectares.	3.3	Good
	AWM	3.5	Very Good

Table 4 shows the Physical Endowments in terms of Land Area. Findings show that Sufficiency of agricultural area got the highest wm of 3.7 with the vd of Very Good, while Area planted with coconut tree is at 35,455 hectares got the lowest wm of 3.3 with the vd of Good. Respondents perceived the province to be endowed with sufficiency of agriculture area that conforms to PSA data which show that the province of Marinduque has 38,079 hectares of farms with various land use. Of the 38,079 farm lands 31,626 hectares are planted to permanent crops, 5,300 hectares are planted to temporary crops, 407 hectares are lands lying idle.

Table 5. Overall Physical Endowments

Physical Endowments	WM	VD
1. Geographical Location	3.5	Very Good
2. Land Area	3.5	Very Good
3. Population	3.2	Good
4. Natural Resources	3.1	Good
AWM	3.3	Good

Finding shows that the overall Physical Endowments is Good with the wm of 3.3. Findings show that Geographical location and Land area got the highest wm of 3.5 with the vd of Very Good, while Natural resources got the lowest wm of 3.1 with the vd of Good. Marinduque is known as the "Heart of the Philippines" because of its heart shape. It is also referred to as the "Geodetic Center of the Philippines" because of the geodetic marker in the island province, the Luzon Datum of 1911 established by United States Coast and Geodetic Survey (USCGS). A diorite rock with a hole on its center marks the reference of all geodetic, hydrographic, and topographic surveys in the country. (DENR PENRO Marinduque)

PROPOSED INTERVENTIONS

Marinduque is relatively rich in natural resources. However, natural resources are exhaustible, which means that if we use them continuously, we will eventually exhaust them. Conversely, Blackman (2019) proposes that exhaustible and unreproducible natural resources can actually increase year after year, perhaps never coming anywhere near exhaustion. Prudent utilization, conservation, and protection would, of course, make this possible. The researcher hereby proposes the following interventions to promote judicious use of natural resources.

First is the use of technological innovations. Innovations that would increase the productivity of natural resources, increase the recycling of resources and reduce waste in their extraction and processing. For the coconut industry in Marinduque, the establishment of a coconut processing facility would be a good start. This would allow the coconut farmers in the province to extract oil from their nuts and transport the oil instead of the bulky copra.

Second is the serious and aggressive implementation of programs for natural resources. The government, through its various agencies and instrumentalities, has initiated development programs like coconut replanting

and intercropping on the part of the Philippine Coconut Authority, establishment of Marine Protected Areas as well as reforestation and re-greening programs on the part of the DENR.

Third is policy formulation for resource use charges. Resource use revenues are a good source of public funds and, as is widely recommended, these can be used to fund public investments to complement private investment, such as investment in human capital, in public infrastructure, and possibly also in utilities.

Fourth is adoption and reiteration of the 1982 United Nations World Charter for Nature by the province of Marinduque. The widest dissemination of its provisions would greatly benefit nature and its resources. In 1982, the United Nations saw the need for environmental protection and preservation of natural resources. The World Charter for Nature lists the measures to be taken to prevent depletion of natural resources. It also states the importance of environmental protection and the need to create laws on the same subject. Organizations have to take the lead in the push for protection of natural resources, research on ways to conserve the natural resources found in the environment, establish protected areas to conserve natural resources from exploitation, encourage the use of renewable natural resources such as wind and solar energy instead of non-renewable resources which are at risk of extinction.

CONCLUSION

It is therefore concluded that the overall Physical Endowments is Good.

RECOMMENDATIONS

1. Marcopper Mining Disaster in March 24 1996 resulted to the contamination of several water bodies. These water bodies were unproductive and unused for a prolonged period. There is a dearth of literature on the status of these water resources in the province. Even the DENR could not provide a status report, thus, this would be a good area for possible research.
2. Cebu Pacific now flies to Marinduque. However, air transport is too costly and beyond the means of common folks. It has very limited help or support in the transport of coconut goods. Further study may be made on the use of air transport in support to coconut industry.
3. There is a need to empower women in the province. The structure of employment in some areas has an adverse effect on women's employment opportunities and wider economic participation. Research possibilities include socio-economic condition of women working in the coconut industry: the case of Marinduque and on the carrying capacity and optimal population density of Marinduque.
4. Expansion of coconut plantation making use of idle lands. The coconut has been steadily coming down especially with regard to oil consumption. However, all is not lost for the coconut palm. It remains a cash crop and, even with stiff competition from other vegetable oils, it promises to continue to be a profitable venture in the future. It should be brought to the notice of all the decision-making governments and international agencies that the coconut is the most useful and versatile multipurpose plant in the world. Today, coconut suppliers are struggling to meet the growing demands of the global economy, however, they must learn from the current situation, and take steps to ensure that their farms are sustainable enough to stand the tests of time and meet future demands. Coconut farmers are encouraged to partner with various government agencies for proper program implementation.

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