A Preliminary Socioeconomic Profile on Fishermen in Trinidad

Un Perfil Socioeconómico Preliminar sobre los Pescadores en Trinidad

Un Profil Socioéconomique Préliminaire des Pêcheurs de Trinité

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ABSTRACT

The goal of this study was to produce a report showing a preliminary socio-economic profile of fishermen in Trinidad. This study was done because there is a greater need for the understanding of fishermen and the issues they face to efficiently plan and develop the fishing industry in Trinidad. Several factors were evaluated such as; livelihood of the fishermen, fishing facilities, landing sites, fishing gear and species being caught. This research was conducted using non-probability sampling, data was collected via questionnaires, researcher's observation, photographs and four focus group meetings. The results were analysed using Microsoft Excel software and were presented using tables and figures. The Global Positioning System (GPS) coordinates and relevant attributes of each landing site were mapped using ArcGIS 10.4 software.

In reviewing the fishing industry of Trinidad and Tobago. The sector contributes 14% of agricultural GDP and 0.1% of the nation GDP. The sector employs over 9000 fishermen and there are 7400 registered fishermen. There is a total of 65 landing sites in Trinidad and 32 in Tobago. The results showed that the socioeconomic profile of the fishermen in Trinidad is affected by ample factors. These include, the condition of fishing facilities and landing sites, the management of the fishing industry, laws and policies and the fishermen perceptions. In conclusion, the fishers are not satisfied with the current state of the fishing industry; it is affecting their livelihoods greatly. Recommendations are to engage in integrated coastal zone management, community-based co-management, and conducting management effectiveness evaluations.

KEYWORDS: Fishermen, socioeconomic, management, effectiveness, evaluation

INTRODUCTION

The fisheries industry in Trinidad and Tobago has substantial economic and social importance. It provides many jobs, income, cultural benefits and a constant supply of proteins needed for consumption by Trinidad and Tobago's population. The fisheries industry contributes 14% of the agriculture gross domestic product (GDP) and 0.1% of the national GDP (Fisheries Division 2009). The relatively small contribution of the fisheries industry to the national GDP when compared to the energy sector's contribution of 39.9% (Energy.gov.tt 2017) causes the development of the fisheries industry to be often overlooked (Ramsaroop, not dated).

According to Kishore et al. (2006), Caribbean fisheries are threatened by the same factors that affect global fisheries, including; collapsing fish stocks from overfishing and the loss of habitat due to pollution. Trinidad and Tobago is no exception to this as the fishing Industry is greatly affected by overfishing, pollution from hydrocarbons, domestic waste, plastics, urbanisation, conflict amongst stakeholders, ineffective management strategies, and outdated laws.

In Trinidad and Tobago's fishing industry the fisherman appears to be the most overlooked stakeholder when it comes to management of the resource. A possible explanation for this is the lack of co-management strategies. Kishore and Ramsundar (2007), stated that, "Fisheries co-management in Trinidad and Tobago is less advanced than many of the CARICOM countries mainly because the current legislative framework does not allow for the participation of industry stakeholders in the managing of the fishers." Potts et al. (2009), suggest that, "fishermen were of the view that there should be co-management of the fishery rather than fish-stock assessment" for management of the sector.

This leads to a lack of consultation with the fishermen when decisions regarding the resource are being made. For example, this is seen in Guayaguayare and Ortoire where multi-million-dollar fishing depots were built, but are underutilized because they do not completely meet the needs of the fishers in those communities (Rambharat 2017).

LITERATURE REVIEW

The fishing industry in the Republic of Trinidad and Tobago has enormous economic potential, but there is a need for greater understanding of all its resources and stakeholders to manage the sector efficiently. According to Potts et al. (2009), there is a deficiency in updated information and data on the fishing industry in Trinidad and Tobago; especially on the fishermen and their livelihoods. Despite this, several studies were done that explored the socioeconomic profiles of fishers in Trinidad and Tobago.

Socioeconomic data can be captured using different methodologies and strategies, two of the more common methods are conducting surveys and carrying out focus groups meetings. Potts et al. (2009) utilized a methodology involving three different approaches, a data collection phase where an in-depth literature review was done to evaluate the gaps in data. Ten focus groups were arranged to obtain fishermen perception and questionnaires were disseminated to various personnel in the fishing industry. Next, a data analysis phase where Microsoft software was used to analyse the data and lastly, a presentation phase where the findings were presented to the major stakeholders. A slightly different methodology was seen in a study done by Hutchinson et al. (2007). Here, interviews were conducted, and several households were randomly selected

for rapid appraisal household surveys.

The issues faced by fishers are endless. Some major issues included competition, piracy, theft, poor physical infrastructure, poor management, pollution and urbanisation (Potts et al. 2009). In the fishing, industry competition appears in various forms. An example, according to Potts et al. (2003) was the foreign fishers who illegally harvested flying fish and the associated species resulting in serious competition for the Tobago flying fish fishermen. Another example of this can be seen in the competition for human capital in the fishing industry.

In 2007, a study done by Hutchinson et al. (2007) stated that fishing villages such as Orange Valley and Otaheite were losing the younger generation and fishers to more attractive jobs such as CEPEP, which pays TTD 80.00 per day. Similar sentiments were expressed by Potts et al. (2009) where they stated, "the younger generation is unwilling to join and learn the fishing ways because of the hardships and problems associated with the industry". The lack of adequate infrastructure has to be one of the most significant problems faced by fishers in Trinidad and Tobago.

METHODOLOGY

Sampling

The goal of this study was to produce a report showing a preliminary socio-economic profile of fishermen in Trinidad. To accomplish this, we used non-probability sampling methods (convenience and judgemental). This method was selected because of time constraints and the lack of resources needed to construct a sample frame. We conducted our survey during early morning periods because it was the most likely time for fishermen to be at the depots.

Data Collection

Both qualitative and quantitative research methods were applied during this research. This type of approach was used because the aim was to uncover a conceptual understanding of the fishermen's needs in order to develop an effective management plan for the fishing industry in Trinidad. Data were collected from 51 landing sites across Trinidad using various data collection strategies which included; questionnaires, researcher's observations, GPS and a camera. The questionnaires were used for individual fishermen interviews and focus group meetings. Four focus group meetings were conducted in four (4) different locations which included; La Brea, Toco, Moruga and Las Cuevas. Focus group discussions were used to identify the major issues being faced by fishermen as well as fishermen perceptions.

Data Analysis

The data collected from this study was analysed using triangulation. Triangulation involves cross-checking multiple data sources and collection procedures to evaluate the extent to which all evidence converges. The data collected from the fishermen would be compared to the observations made by the researcher and the information collected from the governmental institution and other literature. Microsoft Excel software was also used to analyse the data statistically. The results were presented via tables and figures. The GPS data were analysed using ArcGIS 10.4 software which was then used to generate location and attribute-based maps.

RESULTS AND DISCUSSION

Demographic

A total number of 58 persons responded to the questionnaires. Twenty-nine percent (29%) being from Trinidad's west coast, 26% from each of the east coast and north coast; while 19% were from the south coast. The majority of respondents were from the western coast, the home of the largest soft bottom demersal fisheries in Trinidad and Tobago. It employs about 2500 persons. The west coast is directly influenced by the Gulf of Paria and is considered an area of high species diversity and high productivity. The Gulf of Paria is a shallow semi-enclosed basin, which extends from the south where the Atlantic Ocean water enters through the Serpent's Mouth and exits the northern end into the Caribbean Sea through the Dragon's Mouth. This area is heavily influenced by the Amazon River, the Orinoco River, the Caroni River and about 15 other river systems, which account for the high productivity found in the Gulf.

The fishing sector in Trinidad appears to be predominantly occupied by males. This is reflected in the results of the surveys where 100% of our respondents were males. Despite our findings, a similar study was done which showed that women play a vital role in the fishing industry in Trinidad. This is particularly true on the east coast of Trinidad where the first fishing association for women, Women In Fishing Association (WIFA) was established (Kishore et al. 2006). According to Kishore et al. (2006), women are boat owners who actively fish and manage the fishing activities on behalf of their husbands and sons. They are also involved in the fishing groups and community organisation that promote fishing. Throughout the duration of this study, women were observed engaging in the vending aspects of the fishing sector at several landing sites.

There is a high level of diversity amongst the human capital in Trinidad. This is influenced by several historical and cultural aspects of Trinidad's society. Forty-three percent (43%) of the respondents were of African descent, 38% East Indian descent, 17% Mixed race and 2% other. Heterogeneity is seen in fishing villages in Trinidad. There is also a unique blend of rural and urban features seen in fishing villages (Kishore et al., 2006). In most fishing villages the fishermen have a level of access to most social amenities and infrastructure. This rural and urban blend can be seen in villages along both the west and east coast (Kishore et al., 2006).

Fifty percent (50%) of the respondents were educated up to secondary school level and 48% up to primary school level. Traditionally, once a family was engaged in fishing, all of its members took part in the trade. When a young boy was finished with school he joined his father and brothers on the boat. From our study, the fishermen who came from fishing families were most likely to be boat owners and captains.

More than half of the respondents were over the age of 45 years as stated by Tupper (2007). The fisher group in Trinidad is an ageing group, in which the average age of a fisher is 50.5 years, and typically a person who has been fishing for over 30 years. A possible reason for this is the instability of the fishing industry. A study conducted by Soomai (2004) stated, that "due to the perception of fishers that there is no future in the fishing industry; the young people are discouraged and are encouraged to seek other sources of income".

Livelihood

Eighty-eight percent (88%) of respondents were registered with the Fisheries Division. Being a registered fisher is the only criteria needed to obtain the benefits associated with the subsidy program implemented by the government of Trinidad and Tobago. The requirements for becoming a registered fisherman are as follows (Soomai, 2004):

i) Must be a citizen of Trinidad and Tobago.
ii) Must be a fisherman.
iii) Must be a boat owner and or must be a fishing proprietor registered with the fisheries division.

Despite there being no cost attached to becoming a registered fisherman, some 12% of our respondents were not registered. Of the 12% unregistered fishers, 8% were in the process of becoming registered and 2% were sports fishers and didn't see the benefits of becoming registered.

Even though subsidies for fishers are provided by the government they barely cover the expenditure associated with fishing. There are a variety of costs associated with the day to day activities of fishermen (Table 1).

Due to the instability of the fishing industry, environment and poor management, there is a constant fluctuation of expenditure, related to fishing. To mitigate the effects of these fluctuations and sustain their quality of living, fishers would usually increase the prices of fish. For example, "Due to rough seas, it was deemed dangerous for fishers to go fish; this resulted in the low catch, which in turn, contributed to the increase in fish prices" (Jordy Williams 2015). According to Salim Gool (2017), president of the San Fernando Fishing Association, the fish prices are to be increased mainly due to urbanisation of the coast, pollution and piracy. "We are struggling because of the high cost of equipment and we are continuing to suffer at the hands of thieves" said Gool (2017). The Minister of Agriculture and Fisheries, Clarence Rambharat must meet with fishermen soon, said Gool (2017). Gool (2017) also stated that the public will continue to reel from high fish prices unless proper incentives were given to fisherfolk. In 2011, Peter Glodon, Acting Chairman of Trinidad and Tobago Unified Fisher Association, stated that "The price of fish is expected to increase with the imposition of curfew restrictions three miles off the coast of Trinidad and Tobago".

The results revealed that 84% of the respondents were the main providers for their house hold. Seventy-six percent (76%) of the respondents revealed that fishing was their primary occupation; while for 64% of the fishers, fishing was their main source for income. Part-time fishing was the trend mainly seen in respondents from the west and east coasts of Trinidad.

The east and west coasts are strongly influenced by urbanisation, as well as, the oil and gas industry. A study done on the south-east coast of Trinidad by Kishore and Ramsundar (2007) stated that 49% of the sample population were part-time fishers working in the oil and gas sector, agriculture and construction. The results also showed that many part-time fishers were also boat owners.

The income of a fisher depends greatly on his or her role in the fishing community. The various roles can be placed in different strata which include, captain, boat owner, sailor, manager, net repairer/net builder, jostler, engine repairer and vendors (retail & wholesale) (Kishore and Ramsundar, 2007). The captain, sailor and sometimes boat owner are the main stakeholders who actively engage in fishing.

The profit from each fishing trip is typically divided into 5 shares after all expenses are paid. Shares are divided as follows: 1 share for the boat owner, 1 share for the boat engine, 1 share for the net and or fishing gear, 1 share for the captain and 1 share for the crew/sailors. Usually the boat owner; owns the engine, boat and net and gains an extra fraction of the share if he is also the captain of the boat. The boat owner has all power over who gets employed on the boat. The boat owners usually lead a higher quality of life as compared to the sailor and captain.

Landing Sites

There are 65 fish landing sites in Trinidad, however 51 of them were visited during this study. The sole reason for this was because the landing sites were extremely difficult to find or no longer exist, for example the Chatham landing site (Figure 1). Of the sites visited which had fishing facilities, 27 were government managed as seen in Figures 8 and 14 were private (private meaning not managed by the government). The quality of facilities varied widely from a simple shed to a complex building.

Table 1: Showing Day to Day Expenses

Items	Cost (TTD)	Cost (USD)
New boat, new engine and net	$150,00.00	$22,350.19
Used Boat	$30,000.00-65,000.00	$4470.04- $9685.08
Used Engine	$20,000.00-50,000.00	$2980.03-$7450.07
Net	$20,000.00	$2980.03
Bottom Paint (every 3 Month)	$500.00-5000.00	$74.50-$745.01
Gas per trip (20 gallons)	$300.00	$44.70
¼ oil per trip	$150.00-200.00	$22.35-29.80
Food per trip	$100.00-300.00	$14.90-$44.70

According to Tupper (2007), most landing sites are just simply beaches or muddy mangrove outflows with a few huts for gear storage. He further claimed that in many areas vessels cannot land their catch at low tide. On the west and south coasts, muddy type landing sites are usually found. Once the tide is low in these areas, the fishers are not able to leave the site or dock their boats because the engine cannot propel through the muddy sediment.

Tupper (2007) also stated that the fishing facilities at the landing sites appeared rudimentary and lacked basic facilities such as access to ice. Figure 6 shows all the facilities that have ice machines. Of the 51 sites visited during this study only 5 landing sites had facilities for cold storage as seen in Figure 5. Therefore, if fishers do not sell all their catch there is a possibility that it may go to waste especially if there is not a great market demand.

Upon investigation, it was also found that many landing sites did not have running water, working electricity or washroom facilities (see Figures 3,4 and 7). At most of the sites, there was insufficient storage capacity for fishers using the site. To remedy this, some fishers would rent storage areas in the neighbouring houses to store their engine and fishing gear or they would hire a truck to take their engines home. Figure 2 shows landing sites with storage facilities. These extreme measures are taken because of the high levels of theft and piracy. According to Potts.et al (2011), "Security at the landing sites has declined both for the storage of the equipment and gear and for the person who must work there. The lack of security is important for a number of reasons; for instance, with the increased cost of equipment and gear and the lack of adequate storage facilities, theft becomes a serious issue for the stakeholders". Potts.et al (2011) also stated, "The theft of boats and engines can have debilitating effects on the fishery as the supply of fish is reduced during the time taken for a replacement and there is loss of income for the fishers". There was no surprise that 90% of the respondents found that there were insufficient facilities available in their community and 97% were not satisfied with the facilities available to them. The results also showed that 90% of the respondents didn't think the government was doing enough for the development of fisheries in Trinidad.

Fisherman Perception

Using a focus group setting, data was collected on the perception of fishermen. One focus group discussion was conducted on each coast of Trinidad. The focus groups were conducted at the La Brea fisherman association headquarters, Moruga fishing facility, Las Cuevas fishing facility and the Toco fishing centre. There were 4 - 7 respondents at each group meeting.

Fishermen consider themselves an entity responsible for feeding the nation. Despite, playing an important role in the food security of Trinidad and Tobago's society, they are often overlooked. They believe that very little is being done to create a stable, safe and sustainable fishing sector. The fisherman's perceptions were placed into three categories; perceptions on biophysical factors, perceptions on socioeconomics and perceptions of governance in the fishery industry in Trinidad. Table 2 shows the issues faced by fishermen.

Biophysical

i) The fishers indicated there is a general decline in individual species catch. They are no longer getting fish in their usual fishing spots and now pollution generated from the oil and gas industry.
ii) Fishers, particularly from the west coast, stated that recent reports, which claimed that the fish catch off the Gulf of Paria was unsafe for consumption were not true. They claimed that those allegations disrupted their earnings.
iii) From the results, they all seem to agree that ground nets and trawl nets cause destruction to fisheries habitatsmust travel further distances to get the catch. Some believe that this is due to overfishing and .

Socioeconomic

i) The fishermen indicated that the quality of living is greatly impacted by the instability of the fishing Industry.
ii) There is a lack of respect and a lack of appreciation for the fishermen from the national community.
iii) There is a greater need for the development of the human capital in the fishing Industry.
iv) They also believe that a nation-wide awareness campaign would aid citizens in developing a greater appreciation for the fishermen and fishing Industry.

Governance

i) The results reflected that there is a need for stakeholder consultation, for efficient planning and management.
ii) Fishers believe that they are overlooked because of the perception that fishermen are uneducated and incapable of understanding the logistics behind the management of a fishery.
iii) There is a great need for revision of the fisheries Act and fisheries policies.
iv) There is an urgent need for upgrading of fishing facilities and landing sites.

RECOMMENDATIONS

The Development and Practice of Integrated Coastal Zone Management

Integrated Coastal Zone Management (ICZM) is a process for the management of the coast using an integrated approach, regarding all aspects of the coastal zone, including geographical and political boundaries, in an attempt to achieve sustainability. Community-based co-management is an ICZM strategy that can be used. This is where a partnership amongst the government, the local community, NGOs, research institutions, fisherfolk organizations and other stakeholders share responsibility and authority for the sustainable management of the natural resource.

The major advantages of community-based co-management is that it allows for strong stakeholder collaboration. All stakeholders are responsible and

accountable for the resource and it is a sustainable form of management.

To conduct a management effective evaluation, several indicators are tested; these indicators can be placed into three categories; biophysical indicators, socioeconomic indicators and governance indicators. This type of evaluation allows the stakeholder to see if the current management plans being used are completely efficient.

CONCLUSION

To effectively plan and develop the fishing industry in Trinidad more information on the fishermen and the issues they face, needs to be obtained. Several factors affect the socioeconomic status of fishers and a study like this provides data that can be used to make better and more informed decisions.

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Table 2. Showing issues faced by fishermen.

Category	Issues	Effects
Crime	Illegal Fishing	Competition with illegal fisher from Venezuela, Barbados and Grenada. Overfishing
	Piracy	Loss of catch & Property Threat to life
	Theft	Loss of property Threat to life
Impacts of the oil and gas industry	Oil spills and gas leak	Oil can foul boats and fishing gear Tainting of filter feeders Threat to fisher health Concerns with consumption of fish after oil spill affects income of fisher Loss of individual species catch
	Seismic Surveys	Acoustic waves used in seismic survey can cause harm to individual fish Interrupt spawning event Imposed restriction on fisher during seismic surveys Displacement of fishermen
	Drill Fluids	Loss of fisheries habitat Release of toxic chemical into marine environment
Urbanisation	Marine Pollution	Increase emission of various types of pollution into the marine in environment
	Dredging	Sedimentation Displacement of individual species Displacement of fishermen Loss of Habitat
Outdated laws, legislation policies and management plans	Open access	Competition with illegal fisher from Venezuela, Barbados and Grenada. Overfishing
	Lack of ICZM	Conflict between the marine resource users

Map Showing Landing Sites with Facilities

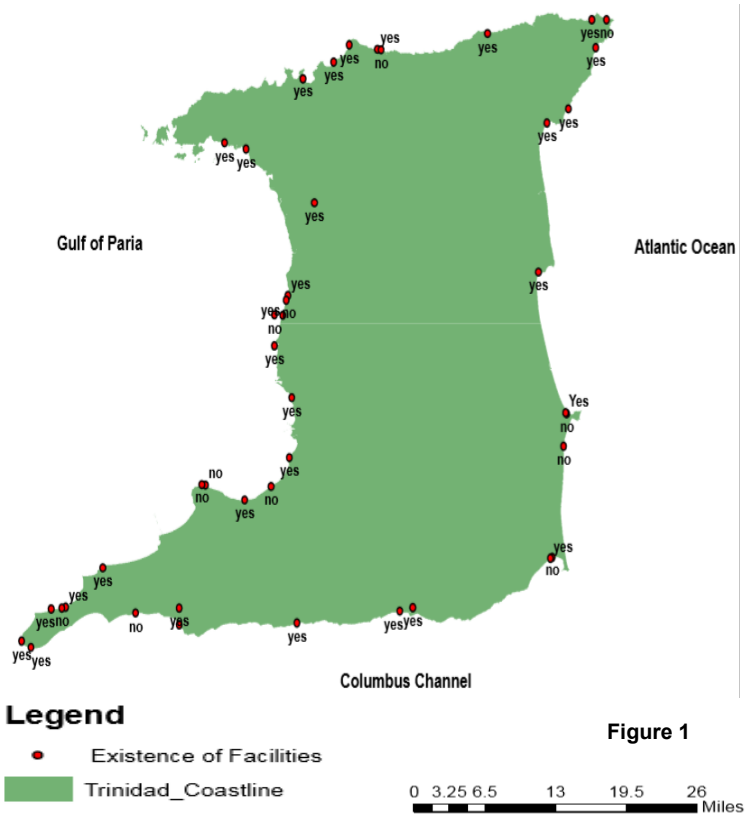

Figure 1

Map Showing Landing Sites with Storage Facilities

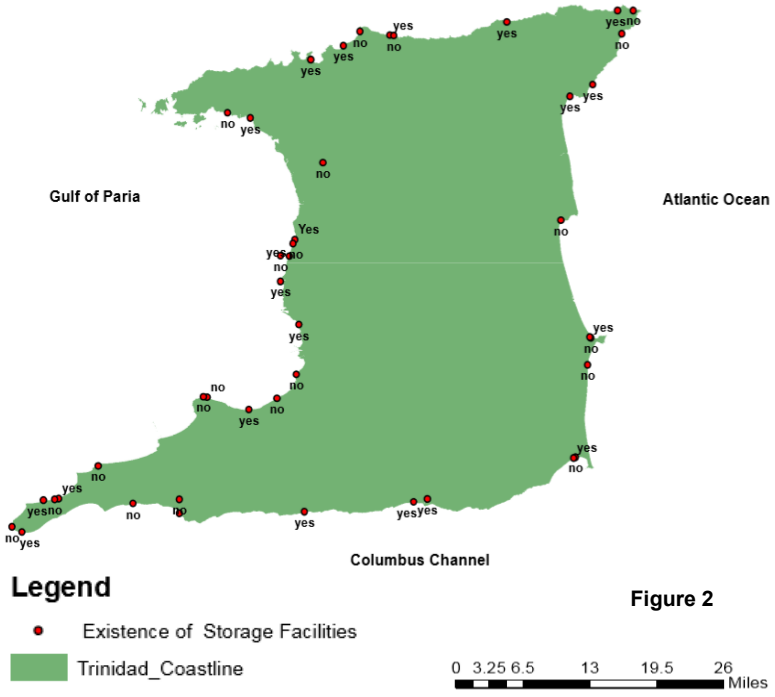

Figure 2

Map Showing Facilities with Running Water

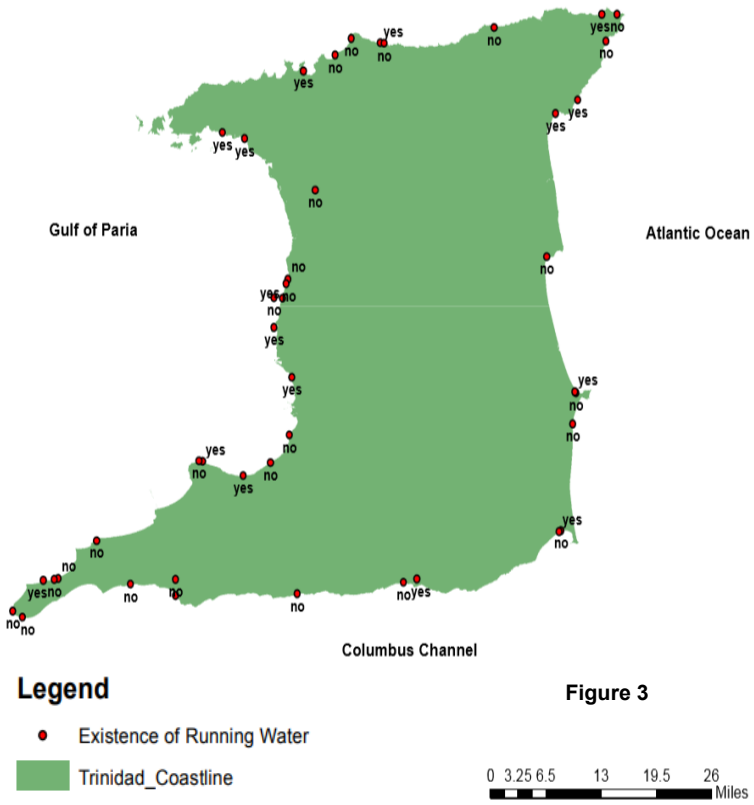

Figure 3

Map Showing Facilities with Electricity

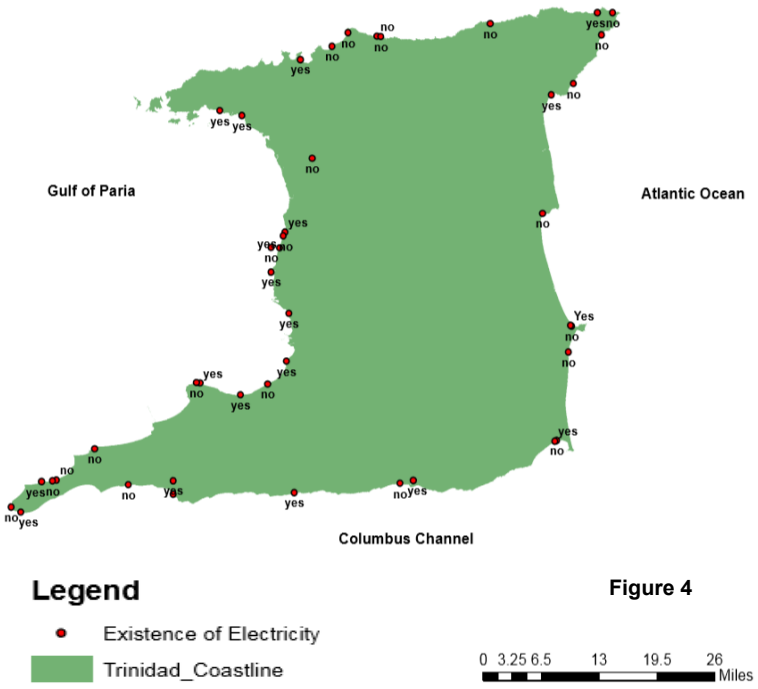

Figure 4

Map Showing Facilities with Cold Storage

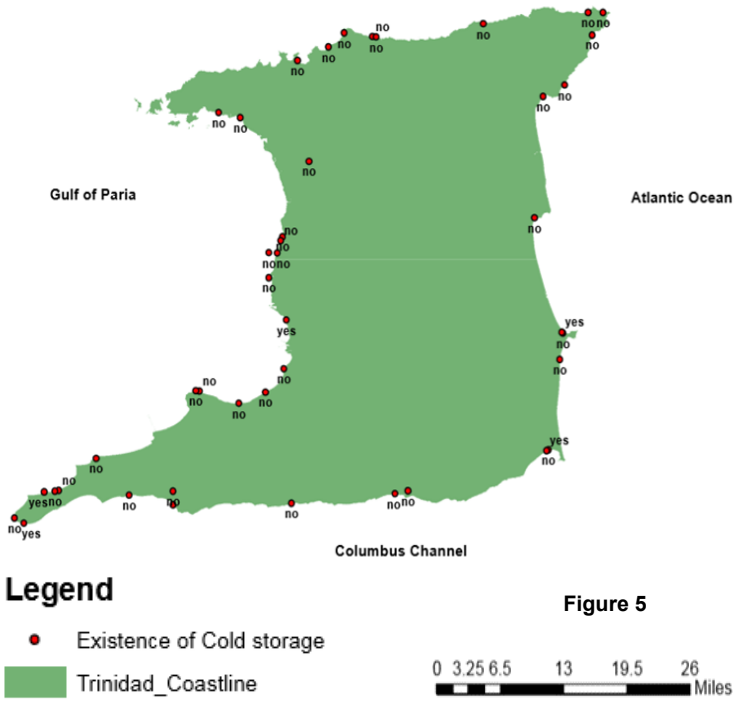

Figure 5

Map Showing Facilities with Ice Machines

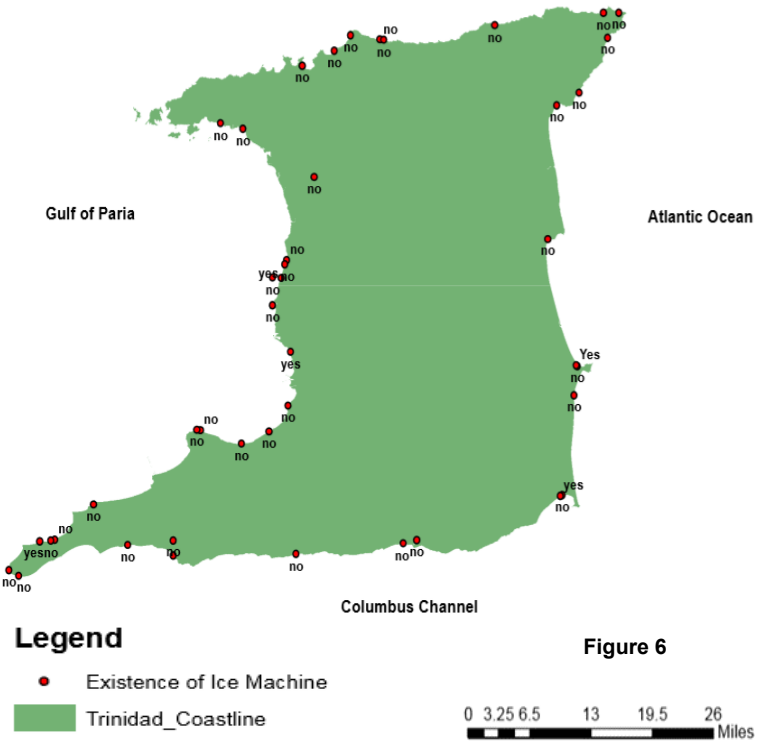

Figure 6

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