



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 Issue: VII Month of publication: July 2018

DOI: <http://doi.org/10.22214/ijraset.2018.7059>

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Landmarks Mapping of Dapitan City Barangays Through Global Positioning System (GPS) Device: Its Integration to Google Earth

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Abstract: *This study aimed to provide a graphical map with route on selected tourist destination within the vicinity of Dapitan City. It also aimed to tag the geographical location of all landmarks in different barangays specifically Barangay Halls, Basketball Courts, Elementary Schools, High Schools, Health Centers, Water Sources, Chapels/Churches, Day Care Centers, Cemeteries, Tourist Attractions, Port and Markets using Global Positioning System (GPS) and integrate the collected data to Google Earth/Google Map. The process of collecting data in different barangays is through the use of GPS. After all the data has been gathered, the GPS's data will then be integrated to the Google Earth through its application then save all the possible entries to integrate all the required information to the database of Google Earth. The geographical map is created based on the actual view provided by the Google Earth software. The result may aid the City Government to view areas subjected to widespread disasters within certain barangay. It helps the government and non-governmental organization, leading hotel companies or any hospitality industries in Dapitan City to enhance customers' travel planning experience. It also aids the local government units (LGU) in decision makings to identify the needs of certain barangay in putting up specific budgetary allocation based on its geographical locations. It helps tourist and customers visiting Dapitan City sites by dragging maps to point out its location and provide GPS coordinates like latitude, longitude and elevation for some researchers. This study may assist the City Government to view areas subjected to widespread disasters within certain barangay and a hub of knowledge pertaining to the geographical location of barangays.*

Keywords: Landmarks Mapping; Destination Routing, Mapping Through Google Earth, Geo-tagging, Mapping with GPS

I. INTRODUCTION

GPS or Global Positioning System is used in determining position and velocity in the planet Earth or even in space, operated by the U.S. Department of Defense (DoD), NAVSTAR (NAVigation Satellite Timing and Ranging). It's a satellite-based navigation system consisting of twenty four (24) orbiting satellites wherein, both of them make two circuits all over the Earth every twenty four hours. Every satellite in space transmits three bits of data, which is the number of satellite with its location in space and every time the data is sent. Signals are picked-up by the GPS receiver, which uses this data to determine the distance to the GPS satellite. Using the signal from the 3 or more satellites, a GPS receiver triangulates its position to the ground called the longitude and latitude from the recognized position of the satellites. Using the same satellites, a GPS receiver then determines the 3 dimensional-position by through the latitude, longitude, and elevation. Moreover, a GPS receiver may provide data regarding the direction and speed of travel. Every individual with a GPS receiver device may access the system since it provides real time, three dimensional routing, positioning and timing at all times, all over the world. It is also used in several applications including Geographical Information System data collection, mapping and surveys [1]. Any application with the same features in natural resource management may include mapping of soils, inventory, threatened and endangered species, lake and stream boundaries and wildlife habitat and vegetation types. It has also been used to provide damage assessment during natural tragedy like earthquakes, floods and fires. GPS has also been used in mapping infrastructures like streets, highways and utilities; mapping management; planning for future growth; and mapping for archaeological sites [2].

Engineers used GPS is also used for surveying when building roads, bridges and other structures. Today, it's easy to be an explorer; the only requirement is a computer with internet connection to access satellite technology in a sense of adventure. Google makes it even simpler with Google Earth and Google Maps, letting to travel virtually to any place in the world with just a click of a mouse [3]. Even though the average person can use these services to explore the planet, researchers and other scientific professionals use Google Earth and Google Maps as preliminary tools to analyse areas around the globe, uncovering some pretty amazing things never seen before.

Rebecca Moore, engineering manager of Google Earth Outreach, recently spoke at Mashable's 2012 Social Good Summit about the power of these tools, which include 80 million kilo meters of road data, 3D terrains and 20 petabytes of satellite imagery. Putting the world in the hand is the most amazing way to the advancement of technology today, which provides accurate, comprehensive, detailed, realistic replica of the planet that has ever existed. It has been used by researchers, archaeologists and satellite explorers throughout the past decade. Google Earth, leads computer becomes a window to anywhere on the planet, allowing to view high resolution aerial and satellite imagery, elevation terrain, road and street labels, business listings tourist spots location and landmarks in different places. Google earth used GPS data to mark map through the GPS coordinates like latitude, longitude and elevation. Most of the places here in Dapitan City even in the entire country are not yet found in the Google Earth. Even the names of barangays are still not registered in it.

Further concept that supported this study is the resource mapping activity on March 2011, which was conducted to the selected communities, following the method that assesses risks using qualitative and field based information on livelihood and food economy zones (Save the Children Fund 1997). This workshop allowed participants to plot in the topographic map with specific geographical location of the major livelihood activities and environmental resources which were then digitized spatially using the ArcGIS 9.3.1 application [4]. It maps significant environmental resources, food sources and livelihood in coastal barangays of Baler, Aurora, Philippines, which was estimated based on research validation activities [5].

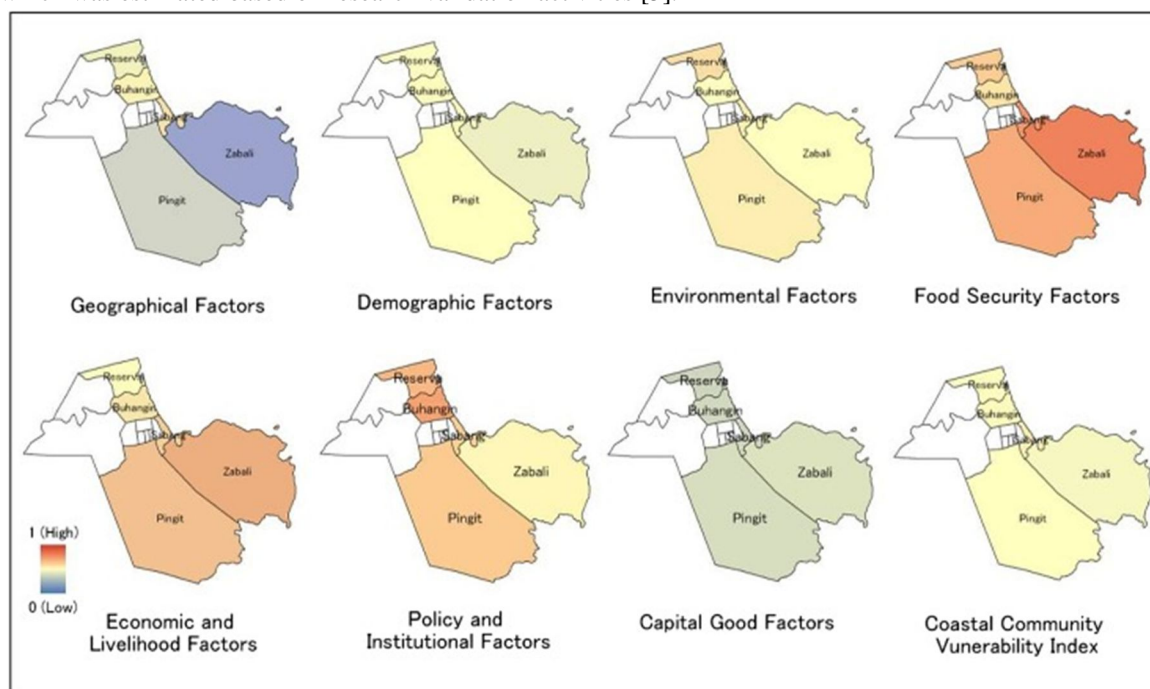


Fig. 1 Map of Significant livelihood and Food Sources and Environmental Resources in the Coastal Barangays of Baler, Aurora, Philippines

Google Earth has been applied in various fields of education, but it has been proven to be very effective in bringing to life the study and analysis of literature through illustration. An English teacher from California, Jerome Burg, started to use Google Earth by collecting pictures to show literary adventures along roads to his students [6]. While searching for ways to get his students more involved in the books they were reading, Mr. Burg came across Google Earth and realized it presented a great illustration tool for his class. Since the application precisely showed geographical areas, he utilized this information to create “literary road maps that find a way to put students ‘right-in-the-back-seat’ of an unfolding journey”. These “road maps” chart the geographic movements of characters in a novel. For example, a class can utilize Google Earth to map Huckleberry Finn’s adventures down the Mississippi River. In doing so, students are able to physically visualize the evolution of the plot and, thus, better understand it.

After successfully applying this idea at his school in California, Mr. Burg shared it with others, creating the Google Lit-Trip Website. It allows teachers in creating students’ Lit-Trip or downloads hundreds of existing KMZ files within the website. All related applications are available and can be downloaded free of charge directly from Google Earth application and is becoming increasingly popular [6].

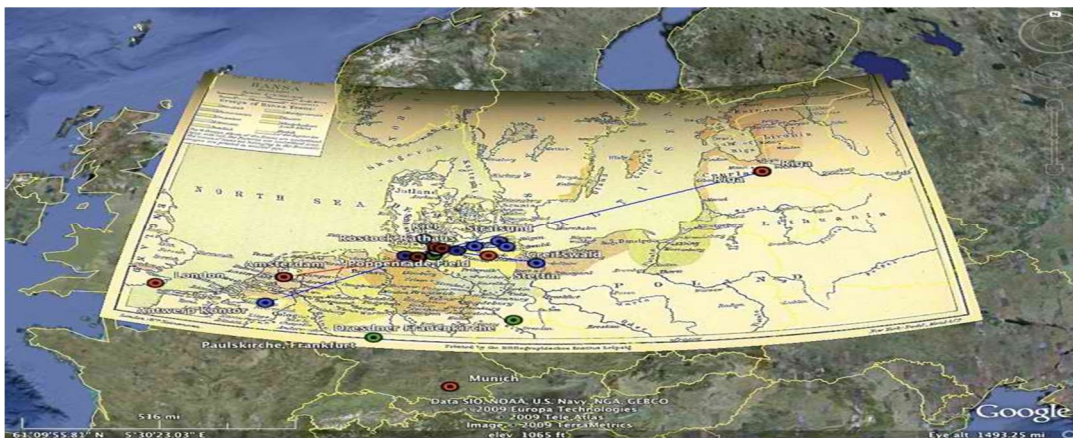


Fig. 2 Illustration on how a Lit-Trip appears on Google Earth

This study aimed to provide a map with graphical representation marking all landmarks, significant locations of all barangays in Dapitan City with the aid of Google Earth through the use of uploaded GPS data. It also intends to explore different information of selected tourist attractions within the vicinity. The result of this study may help the government and non-governmental organization, leading hotel companies or any hospitality industries in Dapitan City to enhance customers' travel planning experience. It helps tourist and customers visiting Dapitan City sites by dragging maps to point out its location and provide GPS coordinates like latitude, longitude and elevation. The City Government officers can view areas subjected to widespread disasters within certain barangay. By enabling certain options, one can browse the significant locations of Barangay Halls, Basketball Courts, Elementary Schools, High Schools, Health Centers, Water Sources, Chapels/Churches, Day Care Centers, Cemeteries, Tourist Attractions, Port and Markets, private and public establishments in different barangay locations. Hotels, restaurant and other hospitality industry owners are also benefited on the result of the study to increase the frequency of tourists and travellers to visit Dapitan since they are already guided on the location of different landmarks of the entire city.

II. METHODS

The researchers sent communication letters to the local government asking permission to gather and collect GPS's data on different landmarks, significant geographical places and other tourist attractions in all barangays of Dapitan City. After all the data has been gathered, the GPS's data are downloaded to the computer using Bluetooth technology through the use of the software package of the device. Installation of Google Earth Application is also required during the development of this study. The GPS's data will then be loaded to the Google Earth Application to enter the starting longitude, latitude and elevation of specific landmarks from the different barangays in Dapitan City. Save all the possible entries to integrate all the required information to the database of Google Earth. The geographical map is created based on the actual view provided by the Google Earth software.

III. RESULTS AND DISCUSSIONS

The following figures below illustrate the maps with GPS coordinates with tags highlighting significant landmarks, geographical locations, historical places, amusement parks, tourist destinations, memorial parks, water sources and freshwater habitat information, natural resources locations, forest, rivers, rice fields, health centers, hospitals, native vegetation, and any other public and private establishments of barangays in Dapitan City, Zamboanga del Norte.

Figure 3 showed the entire map of all Barangays in Dapitan City, Zamboanga del Norte, Philippines. This Map allowed people along the city to understand their place/geographical location in the world, and illustrated invaluable tool for the government and non-governmental organizations, traders, travellers and military leaders. Accurate maps allowed navigators to determine the right way to reach distant locations, and accurate maps were prized by governments. As maps became more accurate over time, it enabled travellers to get unrivalled views of parts of Dapitan City.

There are color-coded marker/tags inside the maps pointing the exact location of different landmarks in certain barangay. A marker identifies a location on a map. By default, a marker uses a standard image. It is designed to make the graphical representation interactive within the whole picture. Red marker represents location of barangay hall; blue marker indicates a health center, while yellow marker also indicates a day care center. It is observed that there is a heart shape located in selected barangay as shown in the figure; this symbolizes location for a tourist attraction. Orange markers are pointing desired location for a basketball court while, the

gray and aqua accent color markers point some selected locations representing a water source and elementary schools respectively. Within the map, it is reflected that there are two vessels like structure symbol, located in barangay San Vicente pointing the Pulawan Port and Bagting where in Dapitan City port is located. The black marker symbolizes secondary/high school. It can be noted that there are only of them found within the map since there are only selected barangays having secondary schools Sulangon; Dapitan City National High School, Barcelona, Ilaya, Potungan, Aseniero, Banbanan, Baylimango, Dakak, Oro and other high school extension located in any other barangays. The fuchsia pink markers are pointing to the location of chapels/churches for different religious affiliation within barangays namely: Roman Catholic, Rizalian, Pentecostal, Seventh Day Adventist, Church of Christ, Church of God, Jehova's Witness, The Church of Jesus Christ of Latter-day Saints, Christ Centered Fellowship and Assembly of God.

Green markers represent cemeteries, which are only limited numbers within the map since there were only few barangays having it. The blue accent markers symbolize a market.



	Day Care Center
	Tourist Attraction
	Basketball Court
	Water Source
	Elem School
	Port
	High School
	Chapel/Church
	Cemetery
	Market

Fig. 3 Map of 50 Barangays in Dapitan City

Figure 4 shows the integrated data with the use of Global Positioning System(GPS) device. The yellow pin is a pointer or marker that points the geographical location of certain landmark like barangay hall, health center, daycare center, tourist attraction, basketball court, watersource, elementary school, high school, port, chapel/church cemetery, bridge and market. It also composed of geographical location coordinate called latitude and longitude. A latitude angles can range up to +90 degrees (or 90 degrees north), and down to -90 degrees (or 90 degrees south). Latitudes of +90 and -90 degrees correspond to the north and south geographic poles on the earth, respectively. Longitude is a term that defines in terms of meridian, which is a half-circle running from one pole to another pole. A prime meridian or sometimes called a reference meridian, is selected to form the reference in which the longitude is distinguished [7]. Point P is longitude of the surface is is determined as an angle of a plane that contains the meridian passing from the starting point P to the end of point P with respect to the plane that contains the prime meridian. If the point P is directed to the east of the prime meridian, its longitude value is positive and if the point P is directed to the west of the prime meridian, its longitude value is negative. Longitude angles can range up to +180 degrees (180 degrees east), and down to -180 degrees (180 degrees west). The +180 and -180 degree longitude meridians coincide directly opposite the prime meridian.

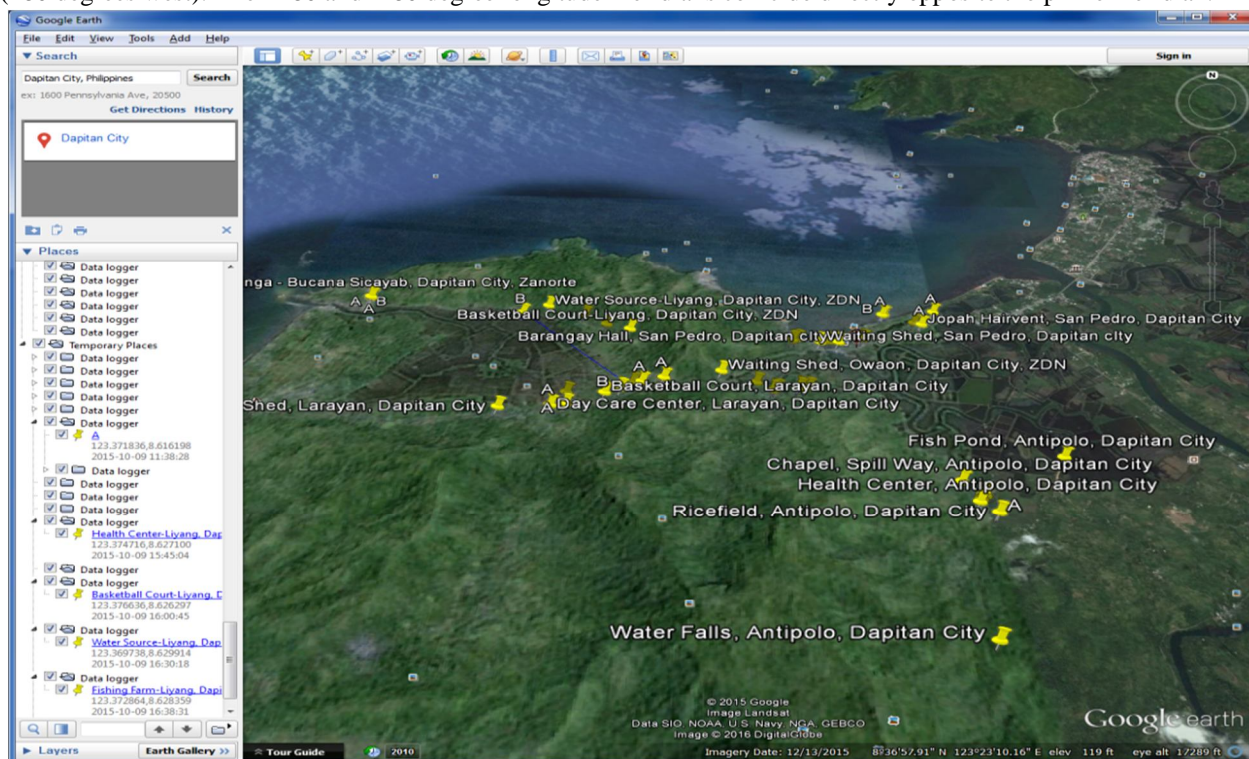


Fig 4. Sample Result of Integrated GPS data with its Geographical Location

Table 1 shows the frequency distribution of landmarks in Dapitan City. As illustrated in the table that all barangays have their own barangay hall where all barangay related transactions are placed. It also serves as a session hall during monthly meetings and all related activities. Health centers are also available in all barangays but some of them have limited stocks of medicines. Day centers for kindergarten pupils are also found in all barangays however, in some remote areas they only have small light material-buildings intended to accommodate children from remote places. Almost all teachers teaching kindergarten pupils in their day care centers have below minimum honorarium or salaries and almost all of them are not professionals / licensed teachers. There is only 32% of barangays have their own basketball courts specifically those barangay in rural areas. Water sources/water tanks are only available in some selected barangays only. Not all barangays have their own chapels specifically in remote places with less population. However, 92% of barangays are having elementary schools and 34% for secondary schools. Whereas, only 70% of barangays have their own public/mini markets and only 10% who have cemetery. Based on the survey, Dapitan City has 26% existing tourist attractions in some selected barangays only and one port located in Barangay San Vicente, Dapitan City.

TABLE I FREQUENCY DISTRIBUTION OF LANDMARKS IN DAPITAN CITY

LANDMARKS	FREQUENCY	PERCENTAGE
Barangay Hall	50	100%
Health Center	50	100%
Day Care Centers	50	100%
Basketball Courts	38	66%
Water Sources	20	40%
Chapel/Churches	41	100%
Elem Schools	50	100%
Secondary Schools	17	10%
Cemetery	5	10%
Public/mini Markets	35	80%
Port	1	2%
Tourist Attraction	13	26%

How to get to Dapitan? Figure 5 shows the route from the three point of departure headed to Dapitan namely: Dipolog City Bus Terminal; Dipolog Airport; and Pulawan Port of Dapitan. Flights bound from Cebu to Dipolog / Manila to Dipolog through Philippine Airlines / Cebu Pacific is landed to Dipolog Airport [8].

From this point, there are available tricycles/motor cycles drive directly to Dapitan or drop off at Sicayab national highway then ride a public utility vehicle for a most economical way in terms of travel expense.

It reaches Dapitan City for about 23 minute- drive with 13.2 kilo meters going to the destination. Guests who drop by Dipolog Bus terminal may ride a bus with its route to destination for about 31 minutes travel time in 16.3 kilometers. Dapitan City is also accessible through ferries from Manila to Pulawan Port through 2GO shipping. Medallion Shipping is also available from Cebu City port to Dipolog City Port located at Galas Dipolog City or George and Peter Lines and Cokaliong Shipping Lines bound from Cebu City Port to Pulawan Port.

The Strong Republic Nautical Highway (RORO), Shuttle Jet and Fast Cat could also be taken from Dumaguete City port to Pulawan Warf, San Vicente, and Dapitan City. Tricycles/motor cycles are accessible going to the center of the city for about 7.4 kilometers with a proximate travel time of 15 minutes; or get off at the national highway at San Pedro, Dapitan City, then ride a bus headed to the city proper or any hotels and pension houses. Beds and Breakfast, Guest houses and Hotels are proliferated sideways Sunset Boulevard along the way to Gloria de Dapitan. Restaurants and eateries are available along sunset boulevard.

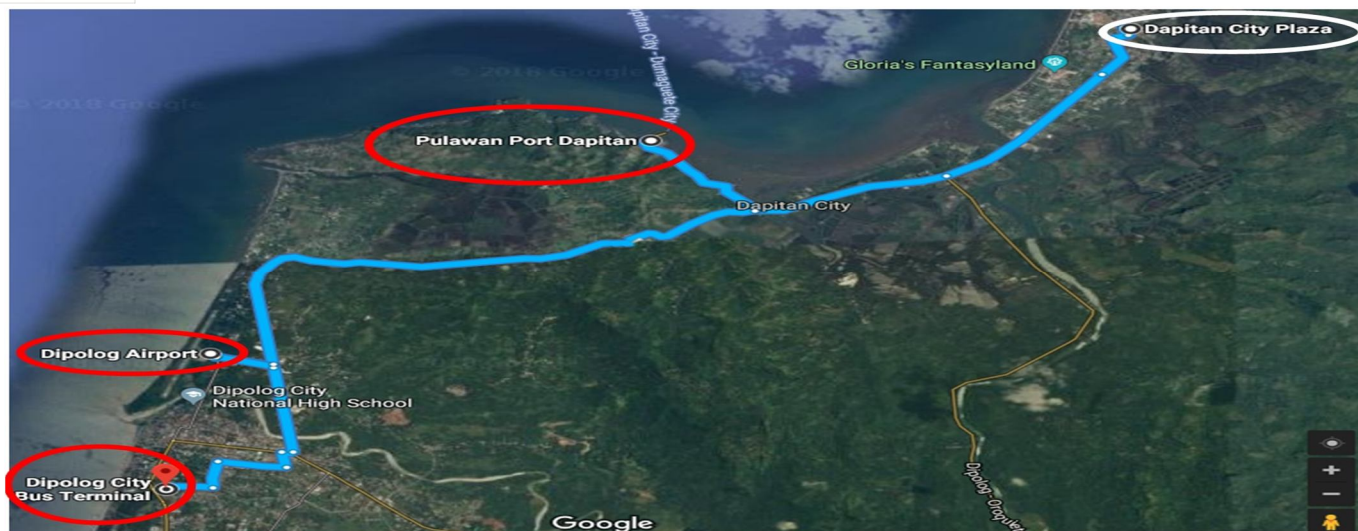


Fig 5. Graphical Route from the Three Point of Departure

Selected Significant Tourist Attraction Landmarks Dipitan has been a name that almost all Filipinos are familiar of because of its importance to Philippine history. It won't be left unmentioned on every story about their national hero, Jose Rizal. Nonetheless, Dipitan is not solely a historic place as it stands nowadays in the province of Zamboanga that offers wide variety of spectacles and undertakings that tourists may enjoy. Based on the result of the survey, the researchers have identified tourist attraction located in some barangays in the City of Dipitan Philippines.

A. City Plaza of Dipitan

Dipitan city plaza is a place to loosen up for guests who are tired from all of the things around or bored inside the hotel room but to roam around the city plaza as illustrated in figure 6, one hectare park that is full of grass and enjoyable place with fresh air to breathe in or just a quiet time to watch people around.

Dr. Jose P. Rizal, the Philippine national hero left the country with several contributions in literatures and in science. One of his work of art is the Relief Map of Mindanao that is used as inspiring tool in coaching geography and history to the people with in the area.

The relief map is situated in-front of St James Parish Church. Although, the map doesn't show precisely the shape of the entire Mindanao at the present time due to natural changes in climate and geography but yet it captured the attraction of his creative work.

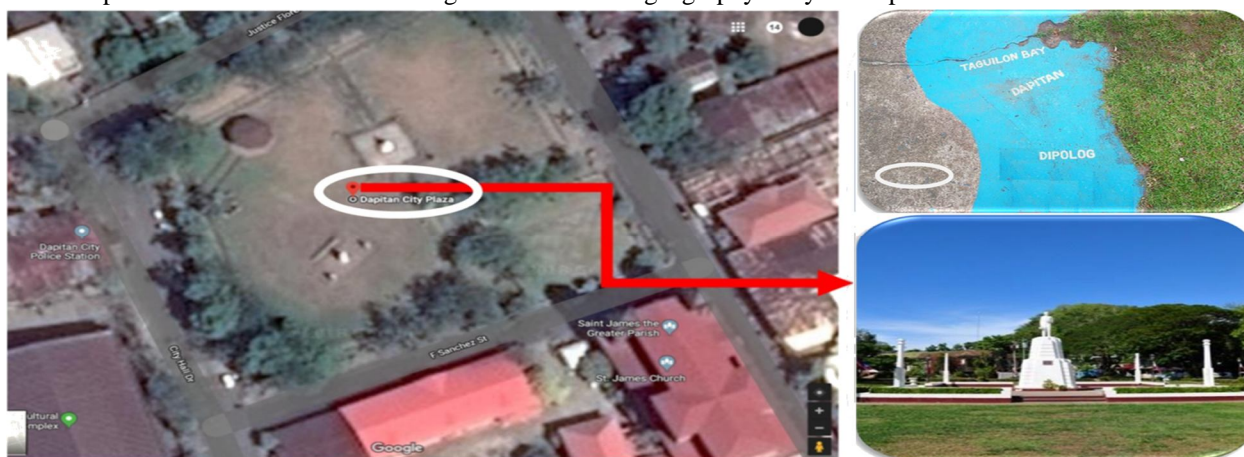


Fig 6. Geographical Location The City Plaza and the Relief Map of Mindanao

- 1) *How to get there:* The City Plaza of Dipitan is located at the center of the city, surrounded by the different buildings and establishments namely: Dipitan City Cultural and Sports Center; Police Station, City Health Center; lane to Jose Rizal Memorial State University Main Campus; Dipitan City Central School; Dipitan City Trial Court, General Services Office; Rizal Memorial Institute Dipitan City Inc.; and St James Parish Church. Travellers from different cities and localities may

consider the location as a point of reference to travel in different destination. Public utility vehicle from Dipolog City may pass on the said location site to Dapitan City Terminal located at City Public Market.

B. Dapitan City Hall/Government Center

Figure 7 shows the geographical location of Dapitan City Government Center/City Hall. It is a newly constructed three story world class building wherein government offices are placed within the locality of Dapitan. Visitors coming from different places are used to drop-off in this place to take photos not only day time but also during night time. Part of the building serves as the session hall for elected officials located at the third floor. Office of the city mayor, office of the vice mayor, offices of the city councillors, city administrator's office, city treasurer's office, commission on elections, accounting office, city budget office, and other significant offices in the government are disseminated along this place.

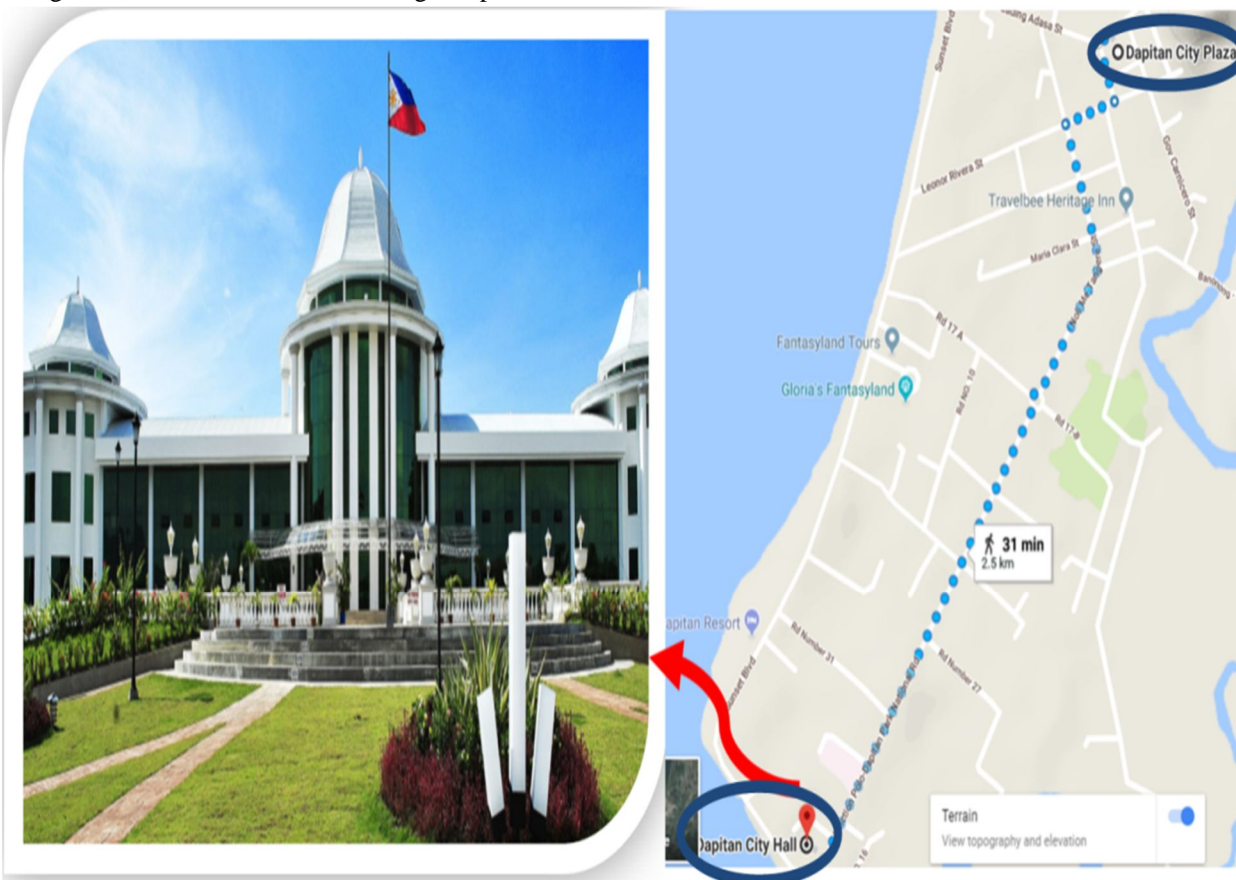


Fig 7. Dapitan City Hall/Government Center

- 1) *How to get there:* The distance from the City Plaza of Dapitan going to the city hall / government center is about 2.5 kilometers along the high way. There are motor cycles available to ride with the minimum fare of 8 pesos. The proximate time of arrival going to the said destination is about 5 minutes. For hikers, the proximate time to arrive is around 31 minutes going to the destination.

C. The Rizal Shrine

The Rizal Shrine illustrated in figure 8 was built by the Philippine national hero Dr. Jose Rizal, a Filipino hero who was exiled in this place during the Spanish colonial era (1892-1896). Its structure is made mostly with bamboos as well as most of the houses were constructed in the earlier times. The native building is surrounded by greenery that includes plants and trees cultivated by the hero himself. It is cuddled with highlands of barangay Talisay and gets a slice of history during old times. His seventy-hectare real property is built with houses, Casas Hospitales, Casa Cuadrada, MiRetiro rock and his residence.

No entrance fee is to be collected and to those individuals wanted to shop some souvenirs, the shrine city shop has available stuff to buy like shirts, necklaces, bracelets, and etc.

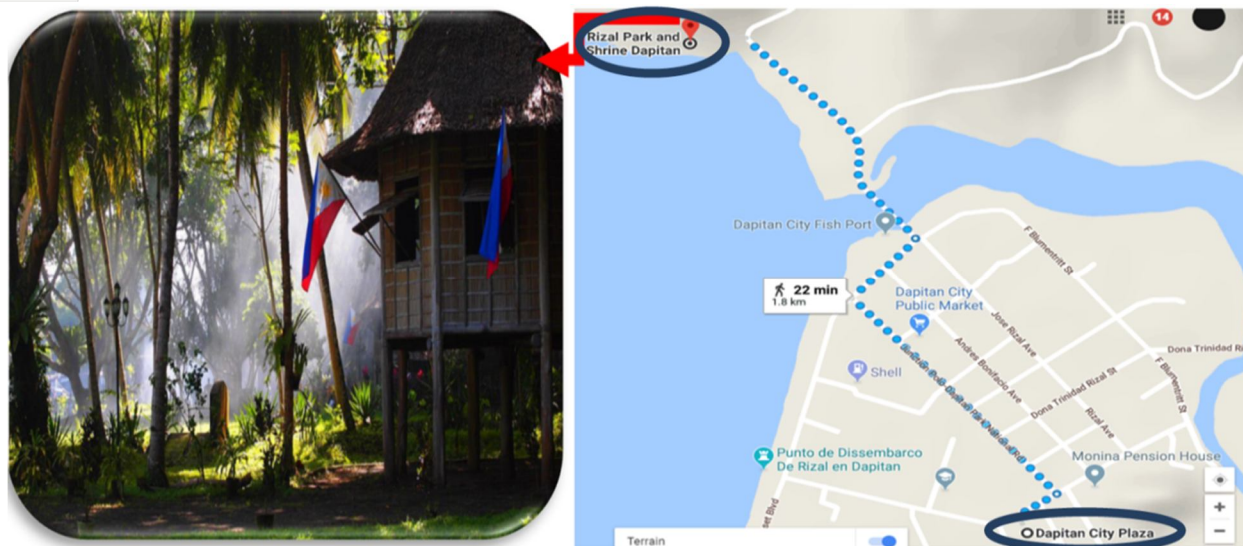


Fig. 8 Rizal Park / Shrine City

- 1) *Direction From The City Plaza to the Rizal Shrine:* The Rizal Park is not far from the city proper specifically the city plaza. It has a walking distance of 1.8 kilometres and around 22 minutes to arrive. To those guests who wanted to use the public utility vehicle as their means of transportation, it passes through the national road, then Doña Trinidad Rizal St., going to the public market of Dapitan and fish port near the bridge going to the destination.

D. The Landing Site

Dapitan has a good-looking sunset and the best area to watch it is at Sta. Cruz Beach where Rizal Landing Site is located. There's no other place to watch and feel what the city can bring forth but by cycling around it. It does get anyone fit too at the same time. There are areas within the city proper wherein guests are safe to roam around, see what the locals are up to and feel the fresh breeze. It's important to always wear the proper attire and safety gears to keep you safe. Wrap up your day with the beautiful sunset in Sunset Boulevard. Expect to get caught right away by its beauty especially when you just happen to pass by the area. But better get yourself ready too in dipping those toes in its cool waters.

Eateries are available nearby, which are serving Dapitanon's version of Zamboanga's knicker-bocker. During sunset, visitors and guests flock nearby the sunset boulevard to have buffet on seafood sold at the seaside in hotels and restaurants. Along the sea shore is a perfect place to eat while the never ending waves lap at the shore.



Fig 9. Landing Site / Punto de Desembarco de Rizal en Dapitan

- 1) *Direction From The City Plaza to the Landing Site:* The landing site is sometimes called “Punto de Disembarco de Rizal en Dapitan”. It is located within the city proper that passes through Jose Rizal Memorial State University, main campus going to the city plaza with approximately 550-meter distance. For commuters, the minimum fare is about 8 pesos with the average travel time of 2 minutes. For hikers, the destination may be reached for about 7 minutes from the center of the city (Dapitan City Plaza).

E. The Gloria De Dapitan - Gloria's Fantasy Land

Dapitan City boasts of the first outstanding and world-class amusement park in the entire Mindanao with an adorable Fantasy Land at Gloria de Dapitan. Guest may go to shopping at one of the department/grocery stores inside or dine in at one of the cafes inside the place. During night time, kids may take inclination in the thrilling ground-rides of Gloria de Dapitana's first theme park in Mindanao, which also deals with a nightly entertaining musical show, and the remarkable fantasy of colors highlighting performers straddling on amazing rainbow-hued floats flourishing a wealth of cultures and visual arts from around the world. The park also built-in 5D Cinema highlighting inflated controlled seats, where viewers could experience realistic effects such as smell, strobe lightings, spraying water and rushing wind and equipped with a 3D glass, screaming like a toddler on the roller-coaster ride through abandoned sub-way tunnels, enormous safari and soaring canyons.

Gloria de Dapitan is a place where everyone can enjoy wide variety of dishes served all around the place. Besides visiting the place to fill the tummy, everyone could also hang-out at the disco bar, salon and children's playground, picnic area; enjoy playing badminton, volleyball, and Frisbee.



Fig. 10 Gloria de Dapitan / Gloria Fantasy Land

- 1) *Direction from the City Plaza to Gloria's Fantasy Land:* The Gloria's fantasy is situated along the sunset boulevard, which is a walking distance from the city plaza of about 1.6 kilometers with 20 minutes hiking while smelling the fresh air of nature around the city. Tricycle or motor cycle/motorbike is available around the city with a minimum transportation of 8 pesos and 20 pesos respectively.

F. Aliguay Island

Well preserved, isolated, a place to rest is what this island all about. When guest happen to backpack around Dapitan or Dipolog, an evening camp in the island is extremely recommended. The beach is fine and white at the same time the water is clear and awash with marine life so forgetting the snorkeling gear could miss half of the island. Aliguay Island shown in figure 11 is white sand powder seashore with turquoise aquatic nature making it a picture-perfect scenery for all. As well staying in the shoreline to unwind and sunburned, guest can also go diving to the deep and calm seawater. Dive-in to get the drift of the lively corals bringing color to below the surface. The best place to place waterproof cameras into use.

It recommended checking the weather condition before planning the trip. This area is quite dangerous during foul weather. The boat ride is an hour or two, depending on the sea's condition.



- 1) *Direction from the City Plaza to Gloria's Aliguay Island:* Figure 12 is the direction from the Google Earth for travelers from Dapitan City Plaza going Aliguay Island. From the starting point at Dapitan City plaza headed to Dipolog Sunset Boulevard where to hire a boat to the island. The distance is about 15.6 kilometers with 25-32 minutes travel time in regular traffic condition and up to 45 minutes using the public utility vehicle for around 25-35 pesos regular fare. Boat transportation from Dipolog to Aliguay is around 2,500-3,500 pesos for about 5-10 persons as a group transport back and forth. Better deal of the payment package is to negotiate 3-5 days before the travel time.

Looking for a place to spend your spare time? Guimputlan would be the best place for you to watch the beautiful sunrise and sunset from the shore. Not only does the place have a beautiful breathtaking scenery but it's also good for playing beach volleyball, sunbathing, picture taking, and forgetting about the city even just for the moment.



- 1) *Direction from the City Plaza to Guimputlan White Beach:* Guimputlan White Sand Resort is part of Dapitan City not quite far from Dapitan City Plaza with 12.9 kilometer-distant from the heart of the city. Guests may take a ride and hire motorcycle to reach the destination varying between 20-25 minutes ride. Visitors who have private vehicle may reach the place in a maximum of 20 minute-ride. Road is not well maintained with floating gravels/big stones so only vehicle which is design for mountains or vehicle with uplifted-wheel can only reach the place.

- 2) *Dakak Park and Beach Resort*: Dapitan is tantamount to Rizal and to Dakak Park and Beach Resort, a high class tourist destination profoundly advertised in television. The luxurious life in Dakak is gently distinguished by the modest way of life with dwellers flourishing near the bountiful shoreline. It also deals an overwhelming array of water activities like kayaking, wakeboarding with speedboat, banana boat ride, pedal boat, parasailing and jet-surfing. This place is also boasted of abundant underwater life, thriving in its island-studded sea wherein scuba diving from wreck to island dives is available. Likewise, adventurers, zone beckons thrill-seekers are thrilled with the longest and fastest dual zip line in Asia including horseback-riding and wide variety of rides as well as bungee jumping, trekking, rock and wall climbing, airsoft, water skiing, sailing, snorkeling, fishing, or spending that much lying down on the sand or enjoy swimming.



Fig. 13 Google Earth View from Dapitan City Proper to Dakak Park and Beach Resort

- 3) *Direction from the City Plaza to Dakak Park and Beach Resort*: Dakak park and beach resort is 11.8 kilometers away from the city proper of Dapitan with a transportation payment package of about 50-100 pesos per head with 15-21 minutes travel time for commuters and guest doing a day tour may commission a habal-habal (motorbike) or tricycle as transport to and from Dakak Beach Resort from the city proper or the city plaza. For guests who already arranged their bookings going to the destination, may avail free transportation from Gloria de Dapitan headed to the place back and forth.

H. St. James Church

This age-old cathedral has played a significant part in history, since it is constructed by the Jesuits sometime in 1871 and for the reason that Jose Rizal used to stand and hear mass in this place during his exile in here in Dapitan. It also sheltered with an 18th century pipeline organ from Germany. A church is a must thing to visit first in every trip. The cathedral's altar's pillars and walling are plainly ornamented, including its stunning ceiling, and amazing art.

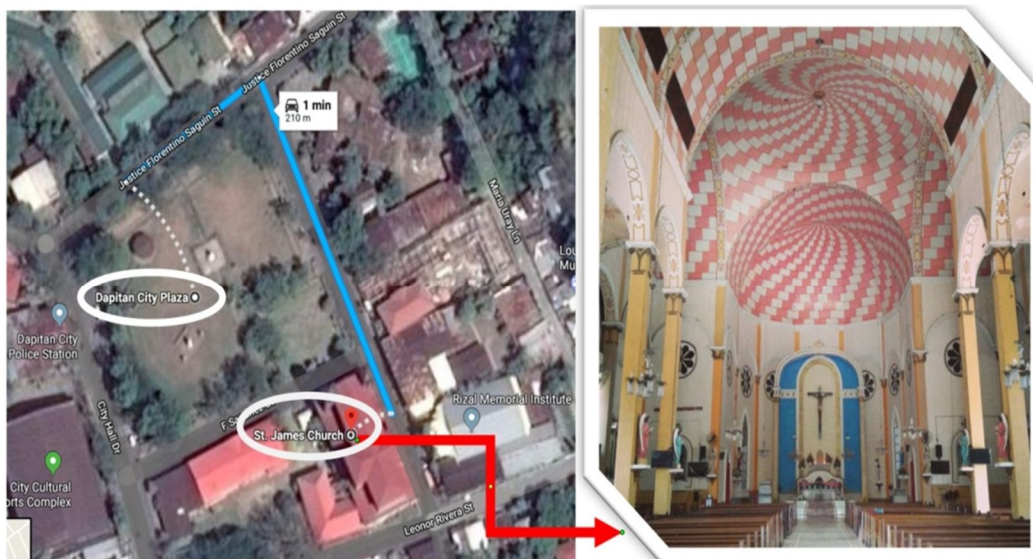


Fig. 14 Route from Dapitan City Plaza to St. James Church

- 4) *Direction from the City Plaza to St. James Church:* St. James is church is a walking distance, which is adjacent from the City Plaza. Its location is about 50meters from the center of the plaza or 5 meters along the sideways of Father Sanchez St or 210 meter-distant along Justice Florentino Saguin St. nearby the police station.

I. Dapitan's Heritage House

Dapitan is acknowledged as a historic district for the reason that the prehistoric origins, collections of many structures and more are well-preserved and everyone could enjoy a slice of history from the past centuries. A saunter and savoring the nostalgic atmosphere of the city street lined up with well-preserved ancestral houses along the road headed to the Dapitan's heritage house where the city government tourism officials are placed. Some of the heritage houses include Page ancestral home, Chong ancestral home, Bajamunde ancestral home and Adasa ancestral home. It is a place where the city's history information took place.



Fig. 15 Route from Dapitan City Plaza to the Heritage House/Tourism Office

- 1) *Direction from the City Plaza to Dapitan Heritage House:* Dapitan City Heritage House or said to be the City Tourism Office is one block next to the City Plaza with more or less 0.5 or a minute travel time for around 230 meters distance from it. It's a walking distance passing through Justice Florentino Saguin St. and arrives to the destination for around 2-3minutes walk through.

J. Ilihan Hill

Before the Spaniards invaded Dapitan, Ilihan Hill served as a burial ground of the original settlers here. Then the colonizers decided to build stone walls and cannons and rename it "Fort de Dapitan". Ilihan Hill is located at Barangay Potol. Going up the hill is not as hard as other people may think since the city government constructed a concrete staircase to make it safer and easier for guests to climb. When you reach the top, you'll see the aerial view of Dapitan you'll never see in other sites.



Fig. 16 Pathway headed to the Ilihan Hill

- 1) *Direction from the City Plaza to Ilihan Hill:* Starting at the city plaza in the direction to the Ilihan Hill is not too far. There are three pathways to the destination. One is headed to Justice Florentino St. and right cross at the end of the road then climb for about 3-5 minutes. Next is the lane in-front of the Dapitan City Central School then left cross at the next corner and walkthrough towards the stairs at the left side headed to the destination. The third pathway is through taking the lane beside the St. James Church and left side across the corner toward Lourdes Village and cross at the left side going to the upstairs proceeded to the destination, which is the shortest path.

IV. CONCLUSIONS

Based on the results, all the specified landmarks namely: Barangay Hall, Basketball Court, High School, Health Center, Water Source, Chapel/Church, Day Care Center, Elementary School, Cemetery, Tourist Attraction, Port and Market are integrated in the Google Earth. There were selected tourist attraction identified namely: City Plaza of Dapitan; Dapitan City Hall/Government Center; The Rizal Shrine; The Landing Site; The Gloria De Dapitan - Gloria's Fantasy Land; Aliguay Island; Guimputlan White Beach; Dakak Park and Beach Resort; St. James Church; Dapitan's Heritage House; and Ilihan Hill. The result may aid the City Government to view areas subjected to widespread disasters that brings up-to-date images within certain barangay. It helps the government and non-governmental organization, leading hotel companies or any hospitality industries in Dapitan City to enhance customers' travel planning experience. It also aids the local government units (LGU) in decision makings to identify the needs of certain barangay and putting up specific budgetary allocation based on its geographical locations. It helps tourist and customers visiting Dapitan City sites by dragging maps to point out its location and provide GPS coordinates like latitude, longitude and elevation for some researchers. This study assist the City Government to view areas subjected to widespread disasters within certain barangay. The result of the study serves as a hub of knowledge, pertaining to the locations of significant landmarks in Dapitan City.

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