



PROSIDING
SEMINAR HASIL PENELITIAN
23 FEBRUARI 2022

**"MENINGKATKAN MUTU DAN PROFESIONALISME DOSEN MELALUI PENELITIAN DAN PENGABDIAN MASYARAKAT
UNTUK PUBLIKASI BEREPUTASI"**

**LEMBAGA PENELITIAN,
PEMBERDAYAAN MASYARAKAT DAN KEMITRAAN
UNIVERSITAS DARMA PERSADA**



**PROSIDING SEMINAR HASIL PENELITIAN
TAHUN 2022
UNIVERSITAS DARMA PERSADA**

Pelindung : Rektor Universitas Darma Persada
Penanggung Jawab : Wakil Rektor I
Pimpinan Redaksi ★ : Kepala Lembaga Penelitian, Pemberdayaan Masyarakat dan Kemitraan
Anggota Redaksi : Prof.Dr. Kamaruddin Abdullah, IPU.
Dr. Gatot Dwi Adiatmojo
Dr. Aep Saepul Uyun, M.Eng
Nursyamsiyah, ST, MTI

Alamat Redaksi : Universitas Darma Persada
Universitas Darma Persada Jl. Taman Malaka Selaltana) Pondok
Kelapa - Jakarta Timur (14350) Telp. (021) 8649051, 8649053,
8649057 Fax.(021) 8649052
E-Mail : lp2mk@unsada.ac.id Home page : <http://www.unsada.ac.i>

KATA PENGANTAR

Seminar hasil penelitian para dosen Unsada semester ganjil tahun akademik 2021/2022 dengan tema “MENINGKATKAN MUTU DAN PROFESIONALISME DOSEN MELALUI PENELITIAN DAN PENGABDIAN UNTUK PUBLIKASI BEREPUTASI” telah dilaksanakan pada tanggal 23 Februari 2022 di Universitas Darma Persada. Seminar hasil penelitian para dosen tersebut diadakan dengan harapan dapat menghasilkan inovasi-inovasi teori maupun inovasi-inovasi teknologi tepat guna dan juga menyampaikan hasil penelitiannya kepada sesama dosen dilingkungan sivitas akademika Unsada.

Prosiding ini disusun dengan menghimpun hasil-hasil penelitian para dosen yang telah diseminarkan dan telah diperbaiki berdasarkan masukan-masukan pada seminar tersebut. Tujuan disusunnya prosiding seminar ini adalah untuk mendokumentasikan dan mengkomunikasikan hasil-hasil penelitian para dosen yang telah diseminarkan. Pada prosiding Edisi II, tahun akademik 2021/2022 ini berisi 11 makalah.

Pada kesempatan ini disampaikan ucapan terima kasih kepada para peneliti, penyaji dan para penulis makalah, penyunting serta panitia yang telah bekerja sama, sehingga prosiding ini dapat diterbitkan. Selanjutnya harapan kami semoga prosiding ini dapat bermanfaat bagi para pihak yang berkepentingan.

Jakarta, 23 Februari 2022

Kepala
Lembaga Penelitian, Pemberdayaan Masyarakat
dan Kemitraan

DAFTAR ISI

DAFTAR ISI	iii
KATA PENGANTAR	v
Kalimat Dua Kalimah Syahadat dalam Kehidupan Ardi Winata	1 - 16
Pola Pembelajaran Kata Kerja Bentuk -te iru Fungsi Progresif dan Perspektif dalam Buku Pelajaran Bahasa Jepang Dasar (Anggota) Hari Setiawan, Ari Artadi	17 - 25
Desain Awal Kapal Tenaga Surya sebagai Alat Penyebrangan Ancol – Kepulauan Seribu Kamaruddin A, Erwin Sadirsan, Fitriani, Riki F.Ibrahim, Rizki Irvana	26 - 39
Pemerolehan Fonologi Bayi Usia 5.2 Bulan (Studi Kasus pada anak laki- laki Adrian Daniswara Sudirgo) Agustinus Hariyana	40 - 53
Rancang Bangun Multi Purpose Prototype WIG (<i>Wing In Ground Effect</i>) untuk kapasitas 22 orang penumpang [Lanjutan 2] studi kasus : Perencanaan prototype dan uji coba Augustinus Pusaka, Y Arya Dewanto, Muhammad Eray	54 - 62
Optimization of Electric Ship Shipping Routes to Support Tourism Transportation at Kelor Island, Tugas Island, Karangan Island and Makasar Island in Labuan Bajo Putra Pratama, Syukri M. Nur, Kamaruddin A, Erkata Yandri	63 - 70
Analisa Putaran Turbin Savonius 2 Daun Akibat Gaya Dorong Angin pada 5 Titik DI Pantai Selatan Jawa Menggunakan Simulasi Software Ayom Buwono, Muswar Muslim,	71 - 84
Perkembangan Islam Di Jepang Dalam Perspektif Strategi Ekonomi, Stabilitas Politik Dan Toleransi Pada Era Pemerintahan Shinzo Abe Indun Roosianie, Erni Puspitasari	85 - 96
Studi Penerjemahan Buku Semantik Bahasa Jepang Dan Aplikasinya Bagi Pemelajar Andi Irma Sarjani, Juariah, Riri Hendriati	97 - 104
Film Animasi Doraemon Sebagai Media Pembelajaran Budaya Jepang Tia Martia, Metty Suwandhani	105 - 115
Pemodelan Hubungan Antar Variabel Sistem Konsumsi pada Penjualan Empat Merek Mobil Tipe Multiguna Kelas Bawah Ario Kurnianto	116 - 128

OPTIMIZATION OF ELECTRIC SHIP SHIPPING ROUTES TO SUPPORT TOURISM TRANSPORTATION AT KELOR ISLAND, TUGAS ISLAND, KARANGAN ISLAND AND MAKASAR ISLAND IN LABUAN BEJO

, Putra Pratama¹, Syukri M. Nur², Kamaruddin Abdullah³ and Erkata Yandri⁴

¹ Lecture of Naval Architect Darma Persada University, 2021

² Lecture of Renewable Energy Graduate Program, 2021

³ Lecture of Renewable Energy Graduate Program, 2021

⁴ Lecture of Renewable Energy Graduate Program, 2021

ABSTRACT.

Indonesia is an archipelago country with 2/3 is the waters so that many have the potential for marine tourism and attract tourists. The Labuan Bajo region is one of the favorite tourist destinations that is often visited by domestic and foreign tourists. Island destinations that are favorite visited by tourists in Labuan Bajo are Duty Island, Kelor Island, Karangan Island and Makasar Island.

THE DISTANCE OF THE CRUISE ROUTE TAKEN IS DIVIDED INTO FOUR STAGES, NAMELY: (1) DUTY ISLAND - KELOR ISLAND (589 M), (2) KELOR ISLAND - KARANGAN ISLAND (2,811M), (3) KARANGAN ISLAND - MAKASAR ISLAND (2,836M), AND (4) MAKASAR ISLAND - DUTY ISLAND (2,233M). THE PLANNED CRUISE TIME IS 10 HOURS FROM 07.00-17.00 LOCAL TIME (LOCAL TIME) SO THAT SHIPPING AND SOLAR ENERGY EFFICIENCY FOR THE BATTERY CHARGE CAN BE DONE OPTIMALLY. BASED ON THE RESULTS OF THIS STUDY, THE TRANSPORTATION SYSTEM IN THE REGION CAN USE 5 ELECTRIC SHIPS WITH OPTIMUM SPEED AT 10 KNOTS, WHERE THE TRAVEL TIME FOR 1 BOAT TRIP IS 237 MINUTES AND EACH SHIP CAN SAIL AS MANY AS 2 TRIPS IN THAT VULNERABLE TIME.

Keywords: Marine Tourism, Solar Energy, Labuan Bajo, Boat Tours

1. Introduction

As we know that Indonesia 2/3 of its territory is water. Indonesia is known as an archipelago state or Archipelago State, which consists of large islands and small islands that contain a variety of natural resources, both natural scenery, fish, underwater petroleum, mining materials and various other types. Natural resources or commonly abbreviated as SDA are things that can be used for various interests and needs of human life so that life is more prosperous in our

natural environment. Natural resources or commonly abbreviated as SDA are things that can be used for the various interests and needs of human life so that life is

more prosperous around our natural environment [Pratama, Putra and Arif Fadillah.2015]. Labuan Bajo is the capital city of West Manggarai Regency which has a very strategic geographical location, where Labuan Bajo is in the western part of Flores Island. Labuan Bajo is also known as a tourism city which is the western gateway to the tourist charm of Flores Island. West Manggarai Regency was formed based on Law Number 8 of 2013 and is a division of Manggarai Regency. With the formation of West Manggarai Regency and Labuan Bajo as district capitals. Based on the spatial structure directions in the East Nusa Tenggara Province RTRW, the Labuan Bajo City area is designated as a priority area. As the capital of West Manggarai Regency, Labuan Bajo City has excellent access and acts as the western gateway to Flores Island to connect the island with growth centers in western Indonesia. Solar energy is one of the energies that is being actively developed by the Indonesian government because as a tropical country, Indonesia has a large enough potential for solar energy according to [Widayana, Gede, 2012]. This research was conducted on several islands in Labuan Bajo, namely Task Island - Kelor Island - Karangan Island - Makasar Island.

2. Study Litelature

2.1 Ship Eletric

Indonesia has quite a large opportunity for electric-powered ships because of the many crossing routes between islands [Sunardi and R. Sapto Pamungkas. 2019]. Ship Electri Motor Propulsion is a direct propulsion motor means of driving the propeller. Propulsion equipment generally consists of a propeller, motor, generator, prime mover and control and other components. Electric propulsion has low noise, good mobility, delivery space flexibility and other advantages [Ji, Qingshan, 2011]. The electric ship presents opportunities and challenges for Naval Architecture according to [Hebner, Robert E. 2014].

2.2 Photovoltaic

Photovoltaic cells (also known as solar cells) are used to convert solar radiation into electrical energy [Dobrzanski, Laszek Adam, 2012]. PLTS (Solar Power Generation) is a power plant that

uses sunlight through solar cells (Photovoltaic) to convert solar photon radiation into electrical energy. The main component in the PLTS system is the solar panel

which is an assembly of several solar cells. The solar cell is composed of two semi-conductor layers with different charges. The upper layer of the solar cell is negatively charged while the lower layer is positively charged. The cells are positioned parallel and series in a panel made of aluminum or stainless steel protected by glass or plastic [Naim, Muhammad.2017].

3. Method

3.1 Vehicle Routing Problems (VRP)

Vehicle Routing Problems (VRP) relates to efforts to design set shipping routes with minimum costs, where each ship starts and ends at a port and each island is only served once by a ship, and the total demand carried does not exceed the ship's capacity according to [Yusuf, Nahri and Jachrizal Sumabrata. 2012]. According to [Fatma, Erika and Winanda Kartika.2017] the purpose of basic VRP is to determine a route that provides a minimum total distance assuming each ship departs from the port and returns to the original port.

3.2 Cycle Time

The length of the cycle time for round-trip public transport routes in the city is one of the most important technical and operational indicators. This value is used to determine the number of route vehicles (RV) required, frequency and headway, distribution of transit vehicles between routes, scheduling and scheduling, and the organization of the combined communication mode on the route [O, Kuzkin,2018]. Meanwhile, according to [Pratama, Putra and Arif Fadillah. 2015], the transportation time for all sub-routes (T) is determined by the following equation:

$$T = \sum_{i=1}^n \frac{d_{ab}}{V_k} + \alpha \quad \dots\dots\dots(1)$$

Where :

- Dab = Distance point A to B
- V = Ship Speed
- α = Time required for the process of binding and untying the rope between the ship and the dock.

The number of trips (N1) by ship waiting at the port for loading and unloading can be calculated using the following equation:

$$N_1 = \frac{T_o}{T} \quad \dots\dots\dots(2)$$

Where :

- T_0 is Total operational time
- T is 1 boat travel time

4. Analysis

Analysis of Vehicle Routing Problems (VRP) of this shipping channel is divided into several scenarios to simplify the analysis process. This grouping is carried out with 1 main port as (Start) the beginning of this tour and return to the Main Port (Finish). The following is the grouping of shipping lanes in this study:

Table 1. Shipping Route Scenarios

Track	Route	Distance (m)
Track 1	1-2-3-4-1	9131,80
Track 2	1-2-4-3-1	9523,77
Track 3	1-3-2-4-1	10926,29
Track 4	1-3-2-4-1	11030,96
Track 5	1-3-4-2-1	9526,39
Track 6	1-4-2-3-1	10880,48
Track 7	1-4-3-2-1	9318,30

From the results of the analysis of the table above, it is found that scenario 1 (1-2-3-4-1) is the route with the shortest distance, namely 9,131.80 meters.

Where :

- Route 1 : Tugas Island
- Route 2 : Kelor Island
- Route 3 : Karangan Island
- Route 4 : Makasar Island

From the results of the shipping channel analysis that has been obtained. In this study, the closest route was obtained, namely 1-2-3-4-1, where the route is Task Island - Kelor Island - Karangan Island - Makasar Island - Task Island. To optimize the number of ships that can be used in this study, researchers used the Cycle Time method so that the optimal total time and number of ships would be obtained. Assuming a predetermined speed and length of shipping time.

The scheme of the Cycle Time method in this study is carried out One Day One Trip or sailing is carried out 1 day during operational time from 07.00 - 17.00. From the scheme above, the researcher will analyze the most appropriate ship speed to get the most effective speed that can be used on this shipping route. The speed of the ship greatly affects the comfort, security and safety of passengers. So that the design of the tour boat speed should not be too fast or too slow.

Tabel 2. Distance Route Ship

Route	Distance (m)	Distance (km)
Tugas Island – Kelor Island	692,99	0,693
Kelor Island – Karangan Island	2414,98	2,415
Karangan Island – Makasar Island	3084,81	3,085
Makasar Island – Tugas Island	2939,02	2,939

In this study, each shipping route above is divided into several stages to facilitate the optimal time analysis process. The distribution of stages can be seen in the table below and the waiting time for tourists to enjoy the natural panorama that is served in Labuan Bajo.

Tabel 3. Stage Route

Kondisi	Step Stage
<i>Start</i>	1
<i>Waitting Time</i>	1
Tugas Island – Kelor Island	2
<i>Waitting Time</i>	2
Kelor Island – Karangan Island	3
<i>Waitting Time</i>	3
Karangan Island – Makasar Island	2
<i>Waitting Time</i>	2
Makasar Island – Tugas Island	1
<i>Waitting Time</i>	1

From the table above, it can be seen that the stage of the ship's cruise line from the beginning to returning to the starting point after turning around the island, sending tourists to enjoy the natural panorama that is served. From the table above is 1 boat trip with waiting time on each island is 1 hour for tourists to enjoy the natural panorama that is presented such as photos or diving.

Researchers analyzed the distribution of the above stages by assuming the most appropriate speed of the ship will be used with a vulnerable time from 07.00 - 17.00 or for 10 hours.

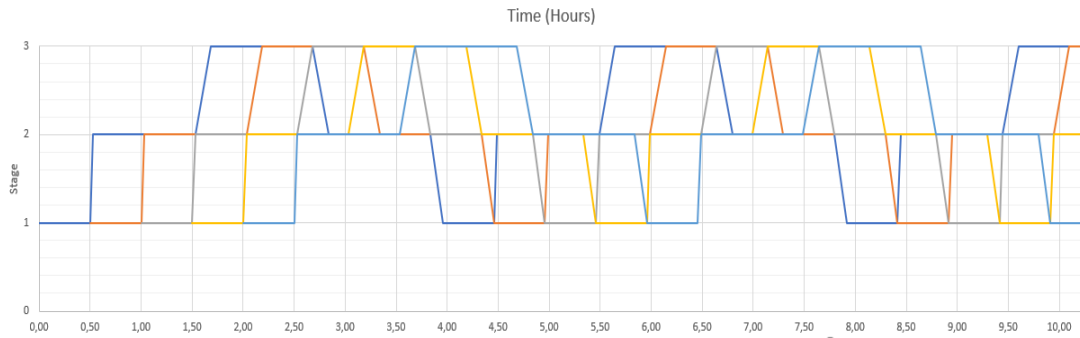


Figure 1. Ship Cycle Time

Where :

- Blue Line : Ship 1
- Red Line : Ship 2
- Grey Line : Ship 3
- Yellow Line : Ship 4
- Light Blue Line : Ship 5

5. Conclusion

In this study, the closest shipping route is Track 1 (1-2-3-4-1), where the route has a total distance of 9,131.81 m or 9,131 km. In this research, the operational time of the ship is from 07.00 to 17.00 for 10 hours and applying the cycle time method can be done using 5 ships and each ship can cover a distance of 2 trips with a ship service speed of 10 knots. Where the travel time for 1 boat trip is 237 minutes

Acknowledgments

Thank you to all the researchers involved in this research, Dr. Ir. Muhammad Syukri Nur, MSi, Prof. Dr. Kamaruddin Abdullah, IPU, Ir. Erkata Yandri, M.Sc.rer.nat, Dr. Aep S. Uyun, ST, M.Eng.

References

- Dobrzanski, Laszek Adam.2012. Monocrystalline silicon solar cells applied in photovoltaic system.Volume 53 ; Issue 1.
- Fatma, Erika dan Winanda Kartika.2017.Penjadwalan dan Penentuan Route Distribusi Komoditas ke Wilayah Timur Indonesia.Politeknik APP : Jakarta

Hebner, Robert E.2014.Electric Ship Power System – Research at the University of Texas at Austin.

Ji, Qingshan.2011.A starting method of ship electric propulsion permanent magnet synchronous motor. Procedia Engineering 15 (2011) 655 – 659.

Naim, Muhammad.2017.Rancangan Sistem Kelistrikan PLTS Off Grid 1000 Watt di Desa Mahalona Kecamatan Towuti.Volume 9 ; Nomor 1.

Pratama, Putra dan Arif Fadillah.2015.Analysis of Coal Transport Optimazion with the Concept of Use Empty Barge in The Port and Utilization of Tidal River. Surabaya : SENTA 2015

Sunardi dan R. Sapto Pamungkas.2019.Studi Ship Kecil Dengan Tenaga Penggerak Listrik Untuk Pengawasan Kawasan Konservasi Sungai dan Muara. Universitas Brawijaya, Malang.

Yusuf, Nahri dan Jachrizal Sumabrata.2012.Opimalisasi Pemilihan Route Pada Distribusi Sepeda Kuning di Kampus Universitas Indonesia.Universitas Indonesia : Jakarta

Widayana, Gede.2012.Pemanfaatan Energi Surya. JPTK. UNDIKSHA.

