



Outboard Engine Maintenance and Repair Training for Fishermen and Kelompok Sadar Wisata (PokDarWis) in Tlocor Sidoarjo

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ABSTRACT

Outboard Engine has been known and used as motor boat among of the residents of fisherman community in Tlocors village. Motor boats powered by outboard engine are not only used for fishing, but also used as marine tourism facilities. Considering the vital functional usage of outboard engine for Tlocor's fisherman community and village community tourism groups (Pokdarwis), for maintaining economic livelihood, any interrupted items that happened during motor operation periods would be very significant impact on their daily life. Loss of income resulting from engine problem is the most of many potential cases occurred on the communities. Hence, it is necessary to provide assistances for both Tlocors Communities, the fishermen, and village community tourism groups. Assistances were also considered part of the public service obligation to communities provided by the Institution. Training on Outboard Engine Maintenance and Repair would become the scheme of the assistances. This tailor- made assistances would be targeted to both clusters. Better understanding and having a certain competency level on outboard engine maintenance and repair would have a significant value in order to empowering both communities, and become the main purpose of the assistance as well

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A. INTRODUCTION

Tlocor village is located on the edges of Porong River estuary, crossed in Sidoarjo Regency. A well-known peace mangrove area with a popular spot for nature lovers, the created Island of Lusi (Pulau Lusi). The economic daily life of Tlocors residences dominated with nature and local economy opportunity relations. Fishing, farming and maintaining mangrove ecosystems. Tourism has also been taken a considerably growth on local economic portion among residents. Considering the significant economic growth on tourism, Tlocor villagers were initiating to found the local tourism groups (Pokdarwis). This



Local tourism group (Pokdarwis) would increase the capacity of empowerments among local, especially on Tlocors marine ecotourism. Operating boat is the most related activity that been done with member of local tourism groups beside fishing that been carried by local fishermen



Figure 1. Ships managed by Kelompok Sadar Wisata (PokDarWis)

Outboard engine is the most dominate of power source for Propel the boat in Tlocor residence. It is simple to install, give a significant power, good endurance and value of money. Aside from the many advantages, there are some operational factors that challenged for the application usage of outboard engine. Engine breakdown at sea, due the lack of maintenance, and overusage load are those mainly case that occurred dominantly on Tlocor. The lack of maintenance and the shortage skill to handle the engine with good operation, are become as the main items to be considered to develop.

Considering the potential of economic lost that would encounter the community, it is necessary to initiate and conduct Outboard Engine Maintenance and Repair Training for Fishermen and PokdarWis in Tlocor.

Fishermen and PokDarWis use outboard engine as the main propulsion of the boats they use. So far, there have often been problems with the outboard engine they use, such as often breaking down at sea. Currently, there are several engines that can no longer be used because they are damaged. This has an impact on disrupting the activities of fishermen and tourism in Tlocor. Therefore, it is necessary to conduct Outboard Engine Maintenance and Repair Training for Fishermen and PokdarWis Tlocor. According to research by Sutrisno et al. (2019), outboard engines are an important component in fishing activities, especially for traditional fishermen. This engine allows fishermen to reach further fishing areas and increase fishing efficiency. However, lack of knowledge about engine maintenance and repair often causes damage that disrupts fishermen's productivity. Hadi et al. (2020) in their study stated that technical training for fishermen, especially in terms of ship engine maintenance and repair, can increase independence and reduce dependence on external technicians. This kind of training can also reduce operational costs and increase fishermen's income. A study conducted by Rahmawati et al. (2021) showed that technical skills training for fishermen can improve economic and social welfare. Fishermen who have the ability to repair their own engines tend to be more productive and have a more stable income. Based



on the Yamaha Outboard Maintenance Guide (2020), routine maintenance such as oil changes, propeller inspections, and fuel system cleaning are very important to maintain outboard engine performance. In addition, early diagnosis of problems can prevent more serious damage. Nurhayati et al. (2022) conducted a case study on boat engine repair training for fishermen in coastal areas of East Java. The results showed that this type of training can improve fishermen's technical skills and reduce downtime due to engine damage. According to the Ministry of Maritime Affairs and Fisheries (2021), technical training for fishermen can have a significant economic impact on fishing communities. Skilled fishermen tend to have higher productivity, which can increase family income and the welfare of coastal communities. BNSP (National Professional Certification Agency, 2020) stated that competency certification for fishermen who have undergone technical training can increase self-confidence and open up new business opportunities, such as opening an outboard engine repair shop. A study by FAO (Food and Agriculture Organization, 2019) shows that countries such as Thailand and the Philippines have succeeded in increasing the productivity of fishermen through ongoing technical training programs. This program includes training in ship engine repair, navigation, and catch management.

B. METHODS

The training implementation method is described in Figure 2. There are two processes, namely technical studies and analysis.

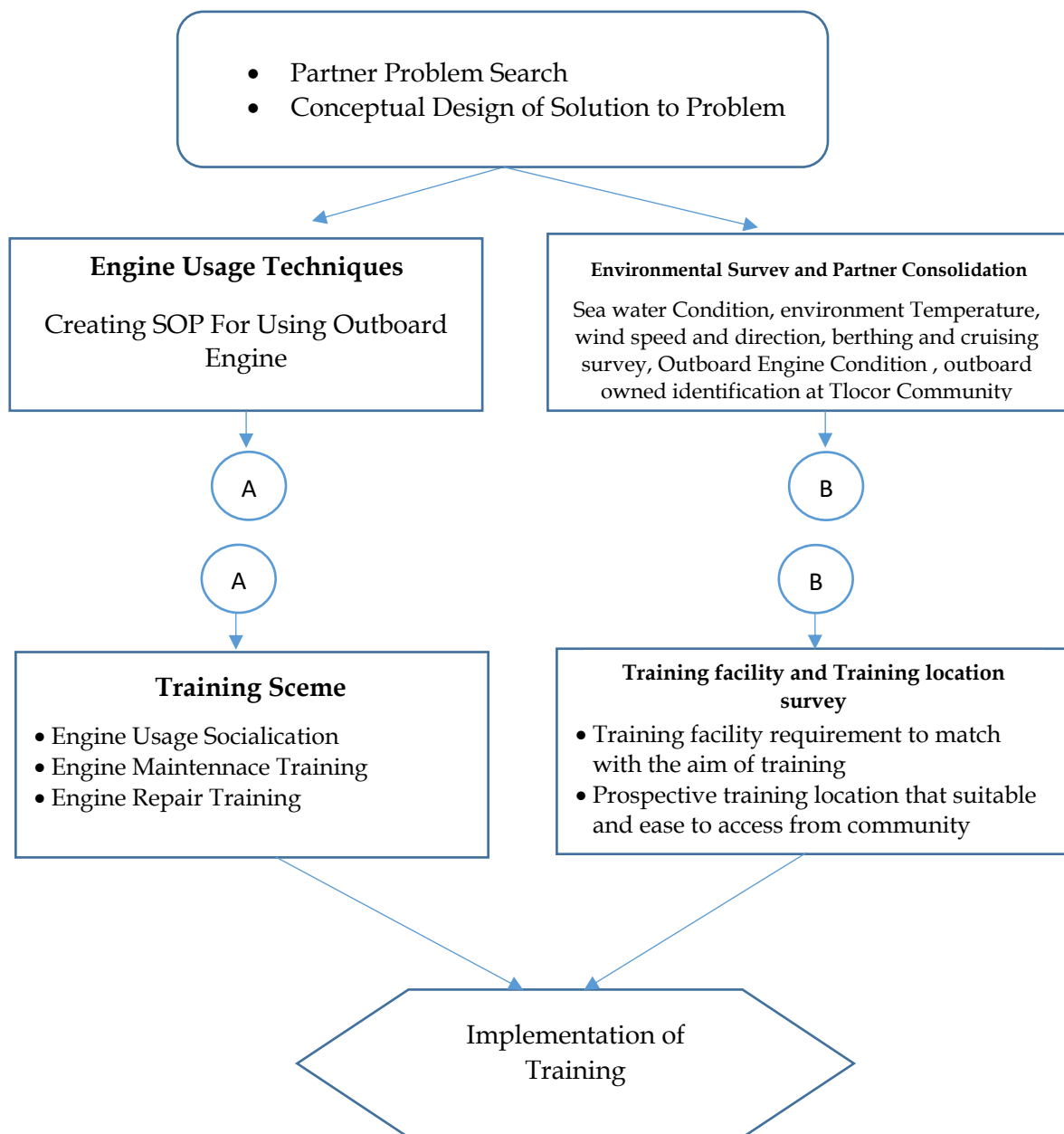


Figure 2. Activity Implementation Flow

1. Preparation

At this stage, a problem analysis is carried out on partners, namely fishermen and POKDARWIS Tlocor. After the problem is found, a conceptual design of a solution to the problem is then made.

2. Surveys

At this stage, a survey was conducted on fishermen and Pokdarwis Tlocor to obtain the level of knowledge about outboard engine maintenance to support the productivity of Tlocor's capture fisheries and marine tourism. For this, data is needed such as whether there is support from the Partner. Will this program be sustainable, because this activity will be aligned with the government's program on the Program to increase the focus of development in the capture fisheries sector and the tourism sector



3. Completion

After conducting the survey, socialization and training activities were carried out on the maintenance of outboard engine ship work equipment to support the productivity of Tlocor's capture fisheries and marine tourism. The goal is that the solutions offered can be implemented immediately. After completing these socialization and training activities, it is hoped that the community will:

- Have the skills to operate the outboard engine to the correct standards, so that the engine has high usability. Have the skills to create a maintenance schedule and carry out the maintenance schedule correctly so that the engine's lifetime can be longer.
 - Eradicating unemployment and opening successful independent businesses, because young people / youth groups have good competence to carry out maintenance and repairs of outboard engines properly, so that the community's economy will improve.
4. Training in this activity is structured into several stages, namely providing outboard engine maintenance material and outboard engine dismantling and repair practice.

C. RESULTS AND DISCUSSION

This activity consists of two activities, namely providing material and practicing Outboard Engine repairs.

1.1. Outboard Engine Maintenance Materials

Outboard Engine repair and maintenance materials consist of three main aspects of the maintenance : The proper procedure to install outboard engine, and Prepare and hadle the outboard engine before and after operation, and maintain dan replace components that fail. Identification of consumable equipments due to operation of engine, replacement procedure and set up of the consumables, are the emphasis of this training scheme section.



Figure 3. Presentation of Material

a. Installing Outboard Engine on the Boat

The installation of the outboard engine is adjusted to the engine manual book, so that the thrust produced by the engine can be optimal. Install the outboard engine so that the anti-cavitation plate is between the bottom of the boat and the level 25 mm (1 in) below it. Then for the engine tilt about 12 degrees from the transom.

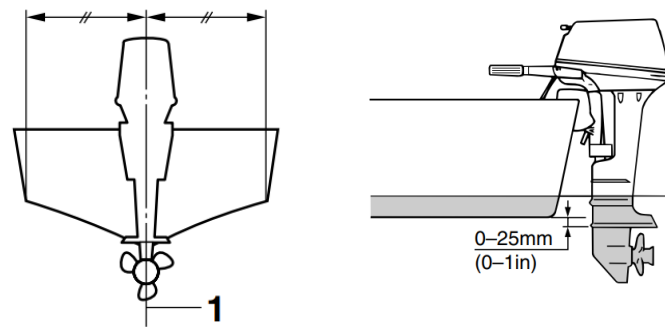


Figure 4. How to install an outboard motor on a boat

b. Maintaining The Outboard Engine

In order to guarantee of the the outboard engine lifetime, users must pay attention to the existing manual book, where components must be replaced according to the manual book guide as described in Figure 5 below.

JADWAL PERAWATAN		Simbol "●" Perawatan yang dapat dilakukan sendiri Simbol "○" Perawatan yang dilaksanakan oleh DLR Yamaha			
Item	Tindakan	Permulaan	Setiap		
		20 Jam(3 Bln)	100 Jam(1 Thn)	300 Jam(3 Thn)	500 Jam(5 Thn)
Oli gigi perseneling	Penggantian	● /○	● /○		
Busi	Inspeksi/Penggantian		● /○		
Filter bahan bakar	Inspeksi/Penggantian	● /○	● /○		
Anoda	Inspeksi/Penggantian		● /○		
Titik Pelumasan gemuk	Penambahan gemuk				
Aki (Level Elektrolit,Terminal)	Tambahkan air aki				
Tali Timming	Inspeksi/Penggantian		○		
Impeller Pompa air	Inspeksi/Penggantian		○		
Baling-baling/mur baling-baling/pasak	Inspeksi/Penggantian	● /○	● /○		

Figure 5. Outboard Engine Maintenance Schedule

1.2. Outboard engine disassembly practice

Disassembly of the outboard engine is done by studying the parts of the Outboard Engine as well as to find out which engine components are often damaged or which are critical components. Disassembly is done on the lower unit, namely the propeller, gear pump and forward and reverse gear and the upper unit, namely the piston, engine cooling components, spark plugs, carburetors, fuel pumps and fuel filters



Figure 5. Dismantling the Lower Unit Section



Figure 6. Water pump inspection

D. CONCLUSION

The activity was carried out in August 2024 with fishermen and PokDarwis Tlocor. The activity was carried out at the Surabaya State Polytechnic of Shipping for 1 day with material on maintenance and repair of Outboard Engines. Then the fishermen and PokDarWis practiced dismantling the outboard engine on the lower unit and the upper unit. The result of this activity is that fishermen and PokDarwis have the competence of Outboard Engine Maintenance and Repair, so it is hoped that they can minimize repair costs when damage occurs. In addition, it is hoped that PokDarwis can make an outboard engine workshop to improve the economy of the Tlocor community.

E. ACKNOWLEDGEMENTS

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F. AUTHOR CONTRIBUTIONS

In the implementation of the Outboard Engine Maintenance and Repair Training Activity, each team member has a clear role and responsibility. Abdul Gafur as the team leader, is responsible for coordinating all activities from start to finish. Edi Haryono, Dimas Endro W.,



Benedicta Dian Alfanda, Imah Luluk Kusminah and Lely must coordinate and conduct initial socialization to fishermen and PokDarwis tlocor related to the Outboard Engine Repair training plan. Mardi Santoso, Eko Julianto, and Nopem Ariwiyono are responsible for providing outboard engine maintenance materials. Albert Wida Umbara and Bambang Antoko are responsible for providing outboard engine dismantling materials.

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