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UNIVERSITI
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UTM
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INDUSTRIAL TRAINING FIELD REPORT

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1.0 INTRODUCTION

Industrial training is the final subject of Chemical Engineering Diploma program and it also an important component in engineering curriculum. Purposes of doing industrial training are to help students to apply all the core and non-core courses into real working environment industries. Next, to help students to be able performing basic engineering practices, including technical writing report, communication with colleagues, handling project and generating proposal for betterment of the industries. Lastly, to develop a higher level of integrity, ethical and accountability in practicing engineering. These skills are very important to make the students get used to our real-life working environment.

For my industrial training, the company that being applied is Universiti Teknologi Malaysia, Skudai. My workplace for internship is at Eco Park UTM which supervise by my supervisor Dr. Johari bin Kamaruddin. Dr. Johari is a senior lecture at faculty engineering under chemical engineering department. The duration for my industrial training is from 22nd March 2021 until 15th July 2021.

This industrial training gives a lot of benefits for the students and the company. Industrial training also helps students to learn a new knowledge and gain new experiences from the company itself. Through industrial training program, the bond of university and the industry can be strengthened. However, students must ensure all the task from supervisor are completed before the deadline. This will make the students always disciplined, show good behavior and be responsible with the tasks given throughout the training. Surely this program can provide a positive impact to the students and can motivate them to face their future.

2.0 CONTENT

2.1 HISTORY COMPANY AND ORGANIZATION CHART

2.1.1 HISTORY OF THE COMPANY

It all began in 1904 when a technical school known as Treacher Technical School began its operation. This school supposed to teach Technical Assistants for the Federated Malay States Departments of Railways, Survey and Public Works. Then in 1941, the Technical School has been changed its status to Technical College by decision of Advisory Committee of Technical Schools and the Education. After a few years, a committee was formed by the Ministry of Education in 1971 to recommend Technical College to become a technical University. And in 1972, Institut Teknologi Kebangsaan (ITK) officially formed by DYMM Seri Paduka Baginda Yang Dipertuan Agong. After through tremendous changes in several years, ITK officially declared as Universiti Teknologi Malaysia (UTM) on April 1, 1975.

With the consent of His Majesty Almarhum Sultan Ismail Ibni Almarhum Sultan Ibrahim, Sultan of Johor planned to build a new campus located in Skudai, Johor at cost of RM1 billion. The construction works began in 1978 and the campus officially opened on September 16, 1985. Today, UTM Skudai has built several faculties since 1991. Among these faculties are Faculty of Engineering, Faculty of Science, Faculty of Social Sciences and Humanities and many more. Although the history of education in UTM has gone beyond a hundred years but UTM will always be one of the great educational institutes in Malaysia.

Next is about Eco Park UTM. Eco Park UTM is an integrated park developed under High Impact Research Grant (HIR). It consists of four projects which are Fertigation, Aquaponic, Biogas and Compost. Eco Park was built by Dr. Mohd Johari with the other lecturers. Eco Park has been in operation for over a year since it established. The main purpose of building the Eco Park is to create a more diverse and sustainable environment for our earth. In Eco Park, Dr. Johari manage the aquaponic site by himself and there are two system that Dr. Johari uses. The first one is basic aquaponic system and the second one is Recirculating Aquaculture System (RAS)

2.1.2 ORGANIZATION CHART

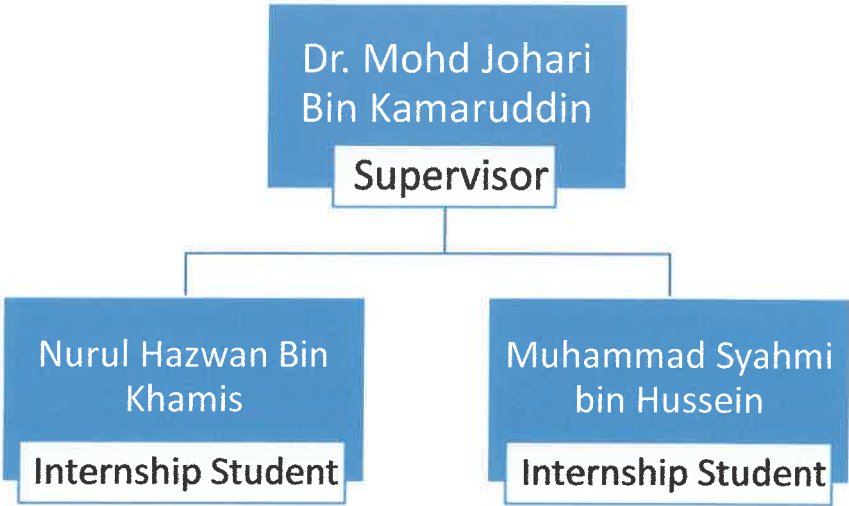


Diagram 1: Organization chart of Eco Park UTM

2.2 PROCESS FLOW

2.2.1 AQUAPONIC SYSTEM

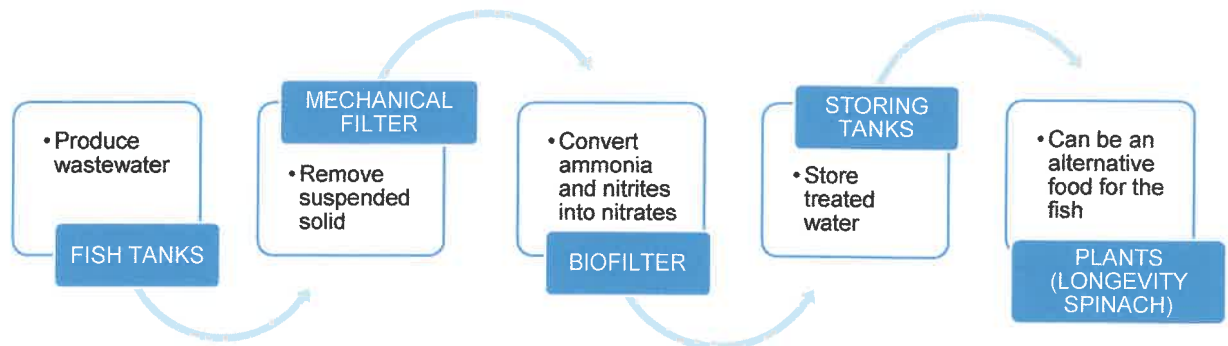


Diagram 2: Flow Chart of Aquaponic System

2.2.2 RECIRCULATORY AQUACULTURE SYSTEM (RAS)

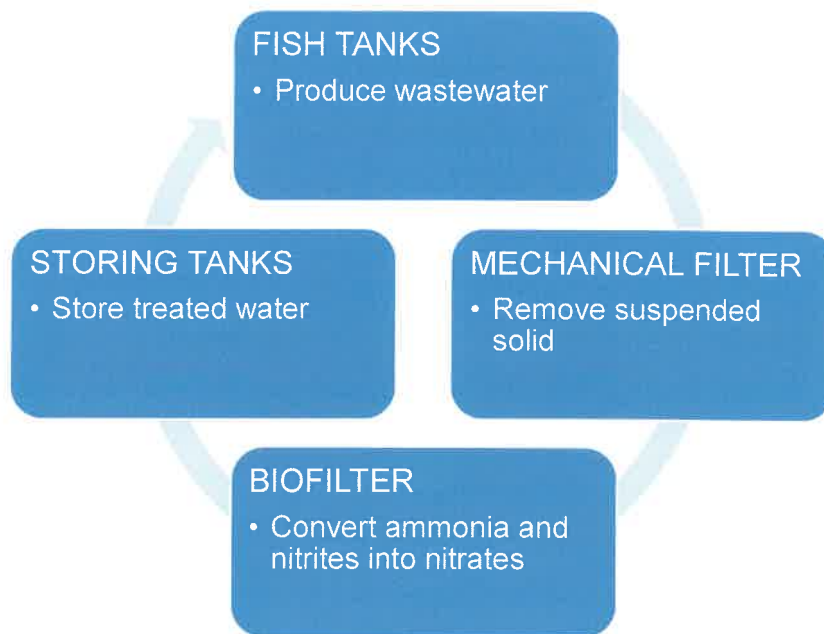


Diagram 3: Flow chart of Recirculating Aquaculture System (RAS)

2.3 DAILY/ WEEKLY ACTIVITY

2.3.1 DAILY ROUTINE

Since my workplace is based on aquaculture, there are several routines I that need to do everyday. The tasks were given by my supervisor to make sure the Eco Park always in a good condition. The first one is to feed the fish every morning. All the fish tanks already have their own measurement on how much pallet needed. 3 scopes of pallet food for the active fish tanks meanwhile for unactive fish tanks only need 1 scope. After a few minutes, if there is an excess of food left, we need to take it out so that the water in the fish tank is not polluted.

Next is to give the plants to the fish once a week. Plants from aquaponic system are used as an alternative food for the fish. We will give the plants to the fish once a week. This will make the fish eat other types of food other than pallet food. Next, to ensure the condition of the greenhouse always in a good shape and solve any problems that occur at the site immediately. Lastly, to make sure the greenhouse is always clean before we leave the place when the work is done.

2.3.2 WEEKLY ACTIVITY

My supervisor briefing about the workplace and the upcoming project on the first day. The upcoming project are a bioflocs aquaculture system and azolla cultivation. In week 1, I have to separate all the stacked tanks because those tanks will be used as fish tanks. Next, I have to clearing the new site from any sharp objects and unwanted grass. After that, I started filling sand to the uneven areas on the worksite so that the project would be stable on the site. In week 2, after making sure the site is completely even, I started on placing the weed mat on the entire site.

In week 3, I started on making azolla pond and setup fish tanks on the site. For the materials, we are using c section metal. The size of the pond is 10 feet x 10 feet. The process involves heavy machine so we have to do it carefully otherwise an injury will happen. So, safety is a top priority in this process. We estimated the process takes about 3 weeks, but we manage to complete it in just 2 weeks. By the end of week 4, we have two structure ponds for the project. In week 5, I started on making nets for covering the pond. The nets are supposed to prevent fall of leaves and other debris into the pond. Then, I started to tie up canvas to the structure.

Then in week 6, I started making a roof for the fish tank using pvc pipe and tank cover. I also started making water piping system for the biofloc system. After finish that, I started filling the fish tanks with water as well as the pond for the azolla. For week 7, I started installing air blower system for the project and inserting azolla into the pond. After that, I started making air piping system and air bubble mechanism. After air blower system completed, I started on making my mini project which was rainwater harvesting. The materials for the project are 2 big storage tank and some pvc pipes. The project takes about 2 days to complete. Finally, all the projects were fully completed before announcement of movement control order by the government.

Starting in week 8 until week 17, I started working from home due to the movement control order (MCO). My supervisor has given me 3 assignment of slide presentation which are the projects I have completed, azolla cultivation, and bioflocs aquaculture system. And I have completed all the task assigned by the supervisor on time.

2.4 PROJECT ASSIGNED

2.4.1 BIOFLOCS AQUACULTURE SYSTEM

Our supervisor gives a project to make a Bioflocs Aquaculture System. The purpose of this project is to make a system that manage aquaculture wastes and create food from its waste. The reason in doing this system is to decrease the cost for the fish food because nowadays fish pallets are very expensive. This system uses microorganisms that can recycled organic compound and convert it into bio floc that can also be alternative food to the fish. This system is one of the best ways to improve environmental control for aquaculture.

The project began from week 1 until week 7. With the guidance of our supervisor, my colleague and I started doing the project. The progress of this project takes a lot of time because it requires a lot of skills. In week 1, we started cleaning the site of this project. Week 2, we started putting weed mat to the entire site. Next in week 3, we started setup tanks and finish making the pond. For week 4, we started making water piping system and air piping system. In week 5, we started making roof for the tanks and started filling the tanks with water. Next in week 6, we started making air blower system for the fish tanks. Lastly, in week 7, the project successfully completed.



Figure 1: Photos of Bioflocs Aquaculture System

2.4.2 AZOLLA CULTIVATION

Our supervisor gives a project to make an Azolla Cultivation process. The purpose of doing this project is to cultivate azolla for aquaculture use. Azolla is an aquatic fern that is a free-floating species that can grow rapidly. Azolla gives a lot of benefits to aquaculture because it has a high content of protein, amino acids, vitamins and minerals. So, it is suitable to be an alternative food for the fish.

This project takes about 3 weeks to complete. The project started from cutting long sections of metal into pieces and assembling the pieces to make a structure of the pond. Next in week 2, we started tying the canvas to the frame structure and started filling the water into the pond. Lastly, for week 3, we started making the nets to cover the azolla pond from falling leaves and other debris into the pond. After that, we started inserting azolla into the pond. The project was completed in 3 weeks.



Figure 2: Photos of Azolla Cultivation

2.4.3 RAIN HARVESTING

Our supervisor gives a task to make a rainwater harvesting system. The purpose of the project is to make a storage system that uses rainwater effectively as an alternative for a water supply in the site. One of the reasons of doing this project is to reduce the water bill of Eco Park. As we know, the greenhouse requires a lot of amounts of water to run all the system in it. By doing this, it can help to reduce the need of municipal water. Indirectly, it can improve greenhouse sustainability.

The project began in week 7. Without the help of our supervisor, my colleague and I started running this project independently. The project takes about 2 days to complete. In day one, we started to design the layout and buying some parts for the project. And in day two, we began to do the project and properly assemble all the parts. And within two days, the rainwater harvesting system was fully completed.



Figure 3: Photos of Rainwater Harvesting

3.0 CONCLUSION

This industrial training gives a lot of new experience, knowledge and skills to the student. I managed to complete my industrial training at Eco Park UTM in 17 weeks. During these 17 weeks, I managed to gain a new knowledge about how wide the mechanism of aquaculture wastewater can be. Starting from mechanism of aquaponic system, recirculating aquaculture system, azolla cultivation process and biofloc aquaculture system. I also managed to gain a huge experience after doing practical work when performing some projects as well as knowing a safety precautions when dealing with sharp tools and heavy machine for example a heavy-duty grinder machine.

Other than that, I developed great skills such as teamwork with colleagues when doing projects, adaptability with new working environment, communication with colleagues and supervisor, integrity and problem-solving. I also learned how to take a good care of fish by feeding them and making sure the water is non-toxic. This industrial training also helped hone my work ethics such as dedication, discipline and productivity.

In conclusion, the purpose of industrial training was achieved when the student was able to involve in a real working environment and acquire a lot of knowledge, experience and skills to be applied in the future.

4.0 APPENDICES

Week 1



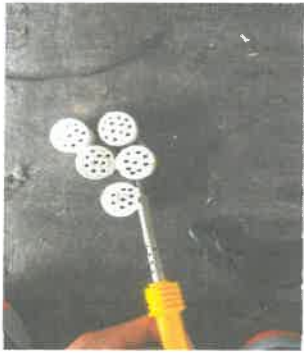
Week 2



Week 3



Week 4



Week 5



Week 6

