ESD ACTIVITIES FOR REHABILITATING MANGROVE FORESTS IN COOPERATION WITH LOCAL COMMUNITIES AT MERBOK MANGROVE RESERVE KEDAH, MALAYSIA

2018-2019



INTRODUCTION

Merbok Forest Reserve consists of 32 species of trees exclusive to the mangrove ecosystem and has been considered as one of the most floristically diverse mangrove sites in the world. Merbok Forest Reserve is located about 1-hour drive north from Penang. Merbok F.R., which is made up of 18 compartments with a total area of 4,176 ha, is under the jurisdiction of the Kedah Forestry Department. The FR also harbors a diverse array of fauna, most prominent are its bird communities where about 80 species have been recorded including migratory species. Other inhabitants include several species of primates, reptiles and a high number of commercially-important aquatic species occupy the estuarine river ecosystem.

In the area, the mangrove and river ecosystems play an important role in providing livelihood for fishermen and the surrounding village communities. Some parts of mangrove forests have been degrading in effect of urbanization and development in the area and it has been big concern on sustainability of ecosystem and biodiversity in the future.

With the discussion with the experts of RCE Penang, we started to make a joint project on **ESD Activities for Rehabilitating Mangrove Forests in Cooperation with Local Communities at Merbok Mangrove Reserve Kedah, Malaysia** to develop the ESD for sustainable rehabilitation program of mangrove forests at Merbok with experts of RCE Penang, Universiti Sains Malaysia (USM) and Japan Malaysia Association (JMA). A collaboration project between RCE Penang, Universiti Sains Malaysia, Kuala Muda District and Land Office, Sungai Petani Municipal Council sponsored by Japan Malaysia Association, Keindaren Nature Conservation Fund and Kinoshita Group to develop Merbok Mangrove Forest Reserve as a centre for education and research on Education for Sustainable Development (ESD) in cooperation with local communities. This reforestation project has been mobilized since June 2018 with several villagers from Kampung Sungai Batu Besi, Merbok, Kedah and collaborations program with stakeholders as well as community engagement program has made approximately **3230** seedlings been planted.

It is hoped that this project will be a model for university-community-partners collaboration that will benefit all parties involved.



OBJECTIVES

- Setting up a nursery for several mangrove species
- Education and awareness program
- Develop ESD program for students and communities
- Living lab projects for biodiversity and ecosystem learning
- Restoring degraded sites with planting suitable mangrove species
- Seminars and collaborations with university-industry-NGO-community
- Training local community on silvilculture
- Publishing materials for knowledge dissemination, teaching and sharing purpose
- As educational tool for local schools, visiting schools and universities to learn about mangrove ecosystem and conservation.
- Platform for ecotourism and contribute to the growing ecotourism

PARTNERS AND SPONSORS

- Regional Centre of Expertise on Education for Sustainable Development (RCE ESD) Penang, Universiti Sains Malaysia (USM)
- Japan Malaysia Association (JMA)
- Keindaren Nature Conservation Fund
- Kinoshita Group Ltd
- Kedah Forestry Department
- Sungai Petani Municipal Council
- Kelab Pendidikan dan Kebajikan Puncak, Lembah Bujang
- Bakau Hijau, Kedah

PROJECT OUTLINES

1. Duration

September 2018 - March 2023 (5th Fiscal Year)

- 1st fiscal year (Sept 2018 March 2019)
- 2nd fiscal year (April 2019 March 2020)
- 3rd fiscal year (April 2020 March 2021)
- 4th fiscal year (April 2021 March 2022)
- 5th fiscal year (April 2022 March 2023)

2. Location

Compartment 11 at Merbok Mangrove Forest Reserve and surrounding area in Kedah, Malaysia.

3. Target Group

- Local Communities in Merbok
- Youths
- School teachers & students

PROGRAMME ON JMA-RCE COMMUNITY ENGAGEMENT

There were series of programs and activities has been organized and implemented through the development of the grant research. RCE Penang and Japan Malaysia Association plays vital role in developing mangrove reforestation activities with local communities. The effective community's engagement started in year 2018 lead by Mr. Mohamad Ridzwan Ishak (Paksu), the community at Kampung Sungai Batu Besi, Merbok Kedah. The programs and activities held are as follows:

• River Cleanup

- a. Protect, conserve and promote living in Merbok river and their biodiversity
- b. Promote restoration and rehabilitation of Merbok river and other water bodies.
- c. Raise awareness and educate all stakeholders about river care
- d. Support capacity building and networking of individuals, communities and organisations in river management

• Nursery Management

- a. Nursery plot preparation
- b. Seed sorting and selection
- c. Transfer the seedling to polybags

• Mangrove Replanting Activities

3230 seedlings Have been planted from September 2018-February 2020



Presently, all seedlings planted are of *Rhizophora apiculata* species with some amount of *Rhizophora mucronata* as requested by the Department of Forestry, Kedah. The following is all activities that have been conducted under this project (September 2018 - February 2020) with the local community, Universiti Sains Malaysia and other groups as stated.

- i. Ongoing seeding and nursery work started since **September 2018** until current.
- ii. 23-25 November 2018: Camp Bakau 1.0 This is an outdoor camp for primary and secondary students which introduced the mangrove ecosystem and their importance. Several related modules delivered by RCE fellows and students get to participate in outdoor activities in the mangrove environment. Each participant also replant a number of seedlings during the program. The replanting activities by participants was the kick-off to starting the reforestation program for this project.
- iii. 23-24 February 2019: World Wetlands Day celebration with RCE Sejahtera Youth, Universiti Sains Malaysia. The theme for 2019 is Wetland and Climate Change. 40 USM students from various courses were involed. A number of activities held included, mangrove replanting, river cleanup, a talk on mangrove ecosystem and a movie screening on climate change. 200 seedlings were planted at the site.
- iv. **6 April 2019:** Edotco Malaysia Sdn Bhd, a telecommunication supplier company, through its corporate social responsibility (CSR) program has undertaken mangrove replanting with the community. 220 seedlings were planted at the site.
- v. **20 April 2019:** Seri Cempaka International School, Kuala Lumpur, conducted 4 days-3nights field visit to learn about wetland ecosysems. Mangrove replanting field trip with their students and learning on mangrove ecosystems. 100 seedlings were planted at the site.
- vi. **21-22 April 2019:** 2 day-1 night field work on Pedagogy Methodology with School of Educational Studies, USM 3rd year student. The main activities are set based on the concept of ESD by mangrove ecosystems learning and create awareness on the importance of the environment, mangrove ecosystem in Malaysia and around the world. 200 seedlings were planted at the site.
- vii. **June 2019:** Set up Mangrove test plot with 380 seedlings at Compartment 11, Mangrove Forest Reserve Kedah.
- viii. **26 August 2019:** Kick-off ceremony for Mangrove Reforestation with Kinoshita Group. The program was attended by Japanese Consul General and delegation from Kinoshita Group, Japan Malaysia Association (JMA), RCE Penang USM (staff and USM students) together with Kedah District Office, Department of Forestry Kedah and local community. 200 seedlings were planted at the site.
 - ix. **7 September 2019:** Mangrove replanting at a new site (Site 2) with volunteers . 1st measurement on test plot with local children as part of their Science learning.

- x. 30 November 2019: CSR for mangrove replanting by Du Pont Malaysia Sdn Bhd will be held on 30 November 2019. This is a 1-day program on environmental awareness and stewardship to their staff. Mangrove replanting is carried out at the site together with RCE Sejahtera Youth students engagement. 200 seedlings were planted at the site.
- xi. **December 2019 :** 2nd measurement on test plot with local children as part of their Science learning.
- xii. 18 January 2020: Mangrove Reforestation with RCE Tongyeong, South Korea as an Inter-RCE Program on Formal Education Committee. The program was attended by teachers from Tongyeong, RCE Penang USM (staff and USM students) with local children as part of their Science learning. 50 seedlings were planted at the site.
- xiii. **22-23 February 2020**: World Wetlands Day celebration with RCE Sejahtera Youth, Universiti Sains Malaysia as an awareness and education program to the masses on the importance and values of wetlands for humanity and the planet. The theme is Climate Change & Biodiversity. 200 seedlings were planted at the site.
- xiv. **23 February 2020**: 3rd measurement on test plot with USM student volunteers.

Educational Programme

a. Camp Bakau (Mangrove Camp)

The program was held to promote ESD via mangrove ecosystem education to the children and how protection of the mangrove ecosystem is important to conserve fisheries resources and community well-being. At the same time the importance of education was, and knowledge was stressed to the children. This knowledge is crucial as they will be more aware and act to protect their own environment.

From this grant, we also conducted 2 day-1 night field work on Pedagogy Methodology with School of Educational Studies, USM 3rd year student. The main activities are set based on the concept of ESD by mangrove ecosystems learning and create awareness on the importance of the environment, mangrove ecosystem in Malaysia and around the world.

a. Education for All : Community Engagement program with Kelab Pendidikan dan Kebajikan Puncak,Lembah Bujang by RCE Sejahtera Youth.

The Education for All programme is a platform for USM students to conduct direct community engagement -focusing on rural school children. This programme aims focuses on equality education to rural school children using Education for Sustainable Development (ESD) as its main tool. At the same time the programme hopes to develop volunteerism, leadership and social skills amongst USM students and allow them a chance to appreciate the experience of rural lifestyles and landscapes, educate and raise the awareness of the participants on important of education. Through this programme, community in Bakau Hijau, Merbok especially the primary school students will gain knowledge with regards to various techniques of teaching and learning processes. This is relevant with 21st centurylearning concept which education should be collaborative and integrated with the society.

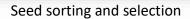
b. World Wetland Day

Wetlands day is celebrated on February 2 every year as an awareness and education program to the masses on the importance and values of wetlands for humanity and the planet. Each year, government agencies, non-governmental organizations, and groups of citizens at all levels of the community, have taken advantage of the opportunity to undertake actions aimed at raising public awareness of wetland values and benefits. Some of these benefits include: biologically diverse ecosystems that provide habitat for many species, serve as buffers on the coast against storms and flooding, and naturally filter water by breaking down or transforming harmful pollutants. COMMUNITY AT KG SUNGAI BATU BESI PREPARING FOR NURSERY PLOT & SEED SORTING





Mr. Ridhwan preparing the nursery plot





Transporting *Rhizophora* seeds to the nursery



Packing soil into polybags



Seedlings in polybags ready for the nursery



All seedlings were gathered before transferring them to the nursery





Transferring the polybags

Mangrove seedlings at the nursery. These will be left to grow for 2-3 months before replanting



Wooden tool shed during construction



Wooden tool shed almost completed with flooring installed

MANGROVE NURSERY AT KG SUNGAI BATU BESI, MERBOK KEDAH



MANGROVE CAMP 1.0 WITH COMMUNITIES AT KG. SUNGAI BATU BESI NOVEMBER 2018





MANGROVE CAMP WITH 3RD YEAR STUDENTS SCHOOL OF EDUCATIONAL STUDIES APRIL 2019





KICK-OFF CEREMONY FOR MANGROVE REFORESTATION WITH KINOSHITA GROUP, JAPAN AUGUST 2019



INTER RCE PROGRAM FOR MANGROVE REFORESTATION WITH RCE TONGYEONG, SOUTH KOREA JANUARY 2020



WORLD WETLANDS DAY RCE SEJAHTERA YOUTH FEBRUARY 2020





CONCLUSION

In conclusion, this project has received satisfactory cooperation from communities and partners. Villagers continue to collect seeds, prepare them for the nursery and to care for the seedlings. The villagers involved seemed very engaged with the nursery activities and show optimism in replanting activities and we hope this will lead to more projects and collaborations in coming years.

RESEARCH TEAM

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