Organisers

Southeast Asian Ministers of Education Organization

MEXT MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY-JAPAN

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2023 SEAMEO-Japan ESD Award

Theme: Promoting Environmental Education through Utilizing Renewable Energy

SUBMISSION FORM

The submission deadline is 15 August 2023
Full Information: https://link.seameo.org/2023SEAMEOJapanESDAward

PART I: DETAILS OF YOUR SCHOOL

1. Name of your school SEKOLAH KEBANGSAAN SEKSYEN 19
2. Full address 19/1 JALAN PETANI, SEKSYEN 19, SHAH ALAM
3. Postcode 40300 4. Country MALAYSIA
5. School's telephone number (country code+city code+telephone number) +603-55415611
6. School's Email Address bba8222@moe.edu.my
7. School website (if available)
8. Approximate number of teachers participated in this programme 62
9. Approximate number of students participated in this programme 828

PART II: INFORMATION ABOUT THE SCHOOL'S PROGRAMME

The information of part II from no.1 to 14 should not be over five (5) pages long of A4 in total. The information should be written in **Times New Roman/Calibri font, font size 11**.

1. Title of the school's programme

TAMAN TEKNOLOGI HIJAU@19: SK SEKSYEN 19 TOWARDS ECOSCHOOL

2. Summary of the programme (maximum of 300 words)

Taman Teknologi Hijau@19: SK Seksyen 19 Towards EcoSchool is a best practice programme which its objectives is to increase education and public awareness of Green Technology. Taman Teknologi Hijau@19 is actually a site that consist of several project under one roof. Such as solar system, rain water harvesting system, aquaponic system and fertigation system.

This project implemented in SK Seksyen 19 also support SDGs and STEM learning and responds to the government's call towards Industrial Revolution 4.0. This Green Technology project has successfully

applied the Project Based Learning. In this project, students have been given autonomy to implement the Aquaponic System project, Fertigation System and Rainwater Harvesting (H2OMES3@19) which uses Solar Energy Technology where this learning is compatible with their level of ability as primary school students.

The Rainwater Harvesting System (H2OMES3@19) was built to overcome the problem of water supply disruption involving the Shah Alam area. This system uses electricity to pump water from the rainwater collection tank to the water filtration system to obtain clean water.
The 2nd project, the Aquaponic System (EZ-Aquaponic@19), is a combination of aquaculture and hydroponics. The 3rd project which is a solar energy system (IDIQASolar@19) for the purpose of saving electricity which is channelled to the EZ-Aquaponic project and H2OMES3@19 project. Special needs students through the Special Education Program (PPKI) also participated in this best practice programme by creating a PPKI Fertigation Plant Solar Technology Project. This project also uses solar energy (IDIQASolar@19).

This best practise programme continues with the innovation of EcoSmart Feeder: Integration in Aquaponics (Integration of solar and Arduino) aims to mobilize the EcoSmart Feeder system and the aquaponics system in order to solve the problem of human dependency in feeding fish routinely which involves determining the quantity of food and the time of feeding using solar system and IOT.

3. Objectives/goals of the school's programme

The objective of this program is to educate the students about the importance of preserving nature. These students are led by competent and highly innovative teachers through the PBL Project Based Learning at school and then practice both at school and at home.

Other objective is to overcome the school's main problem, which is water supply disruptions that often occur in the state of Selangor and in school, especially through the Rainwater Harvesting Project (H2OMES3@19) and reducing the cost of electricity use with a solar technology project (IDIQASolar@19) in school.

Giving students the opportunity to gain hands-on experience through project based learning. It is clear that creativity and innovation in teaching and learning through Green Technology can happen by shifting traditional teaching to PBL. This is in line with the focus on student development in the School Transformation Program 2025 (TS25) and at the same time catalyses the school towards a Sustainable School / EcoSchool.

Become benchmark school for other schools and sharing with community. SK Seksyen 19 is always ready to accept requests from other schools/ institution to establish relationships through benchmarking visits to share knowledge and best practices.

4. Period of the time when the programme has been started

Taman Teknologi Hijau@19: SK Seksyen 19 Towards EcoSchool started with;

2018 – Rain Harvesting project (H2OMES3@19) through Project Based Learning. The school built a real rainwater harvesting system as a learning tool and overcome water problems in schools.
2019 – Aquaponic project (EZ-Aquaponic@19) through Project Based Learning.
2019 – Solar system installation (IdiqaSolar@19) supports from the state government and the private sector. Solar system helps generate power (water pump for filtration process) for rain harvesting project, aquaponic project and fertigation planting project.
2021 – Fertigation project (Projek Teknologi solar tanaman fertagasi PPKI). Project by special needs students through the Special Education Program PPKI.

2021 – Innovation (EcoSmart Feeder: Integration in Aquaponic) using solar system to power the aquaponic system and smartfeeder.
2022 – Innovation (Ecosmart Feeder 2.0: Integration in Aquaponic) using solar system to power the aquaponic system, smart feeder and LED indoor light.
2023 – Innovation (Smart Feeder Kit) Teaching module for teaching aquaponic, solar and coding.
2023 – Innovation (Ecosmart Feeder 3.0: Integration in Aquaponic) This innovation is upgraded with integration of IOT (in progress).

5. Activities (strategies/activities of implementation, and brief information of each activity)

1. **Rain Harvesting project (H2OMES3@19).** Conducting talk & implementing PBL KmR among Year 5 students with the integration of several subjects. Students produce models of rainwater harvesting systems according to their creativity.
2. **Aquaponic project (EZ-Aquaponic@19)** Conducting workshop and implementing PBL KmR among Year 4 students with the integration of several subjects. Students produce mini aquaponic systems according to their creativity.
3. **Solar system installation (IdiqaSolar@19)** at Taman Teknologi Hijau supports from the state government and the private sector. Solar system helps generate power for rain harvesting project, aquaponic project and fertigation planting project. The solar system becomes a learning tools for students to learn about renewable energy. Conducting talk about solar system to students.
4. **Fertigation project (Projek Teknologi solar tanaman fertigasi PPKI).** Project by special needs students through the Special Education Program PPKI. This project is carried out by them with the guidance of teachers. It give students exposure to urban farming skills.
5. **Innovation (EcoSmart Feeder: Integration in Aquaponic)** students innovate using solar system to power the aquaponic system and smart feeder. Continuation of the students' PBL is that they produce innovations related to aquaponics, solar systems and programming. Students compete up to the international level.
6. **Innovation (Ecosmart Feeder 2.0: Integration in Aquaponic)** students innovate using solar system to power the aquaponic system, smart feeder and LED indoor light. Innovation continues with the addition of indoor LED lights for plant growth.
7. **Innovation (Smart Feeder Kit)** Teaching module for teaching aquaponic, solar and coding. Teachers innovate a teaching and learning tools.
8. **Innovation (Ecosmart Feeder 3.0: Integration in Aquaponic)** Students upgraded the product with the integration of IOT (in progress).

*This projects has become a benchmark for schools across the country and educational institutions in and outside the country starting 2019 until now.

6. Teaching and learning approaches/strategies that the school has integrated into the programme

1. **Rain Harvesting project (H2OMES3@19).** Implementing PBL (Project Based Learning) among Year 5 students with the integration of several subjects. Students produce models of rainwater harvesting systems according to their creativity.
2. **Aquaponic project (EZ-Aquaponic@19)** Implementing PBL among Year 4 students with the integration of several subjects. Students produce mini aquaponic systems according to their creativity.
3. **Solar system installation (IdiqaSolar@19)** The solar system becomes a learning tools for students to learn about renewable energy before they doing PBL.
4. **Fertigation project (Projek Teknologi solar tanaman fertagasi PPKI).** Project by special needs students through the Special Education Program PPKI. This project is carried out by them with the guidance of teachers. It give students exposure to urban farming skills.
5. **Innovation (EcoSmart Feeder: Intergration in Aquaponic)** students innovate using solar system to power the aquaponic system and smart feeder. Continuation of the students' PBL is that they

produce innovations related to aquaponics, solar systems and programming. Students compete up to the international level.

6. **Innovation (Ecosmart Feeder 2.0: Integration in Aquaponic)** students innovate using solar system to power the aquaponic system, smart feeder and LED indoor light. Innovation continues with the addition of indoor LED lights for plant growth.
7. **Innovation (Smart Feeder Kit)** Teaching module for teaching aquaponic, solar and coding. Teachers innovate a teaching and learning tools.
8. **Innovation (Ecosmart Feeder 3.0: Integration in Aquaponic)** Students upgraded the product with the integration of IOT (in progress).

7. Engagement with the community and sharing of school practices to the community

This projects has become a benchmark visit from schools across the country and educational institutions in and outside the country starting 2018 until now.

BENCHMARK VISITS BY STATE TO SK SEKSYEN 19 2018 - 2023

	YEAR	SCHOOL & EDUCATIONAL INSTITUTE
1.	2018	29 (Selangor-1, Perak-11 & Melaka-17)
2.	2019	49 (Selangor-1, Kelantan-1 & Terengganu (2X) - 47)
3.	2020	55 (Selangor-34, Perak-20 & Kuala Lumpur-1)
4.	2021	44 (Selangor-44)
5.	2022	92 (Selangor-66, Kelantan-1, Terengganu-1 & Sabah-24)
6.	2023	01 (Maldives) International 07 (Selangor-7)
TOTAL = 277 SCHOOLS		

8. Monitoring and evaluation mechanisms

Monitoring & Evaluation (M&E)

	INDICATOR	DEFINITION How is it calculated?	BASELINE What is the current value?	TARGET What is the target value?	DATA SOURCE How will it be measured?	FREQUENCY How often will it be measured?	RESPONSIBLE Who will measure it?	REPORTING Where will it be reported?
Goal	Become a benchmark from outside schools and other institutions every year.	Total number of schools and institutions making benchmark visits since 2018.	269	279	Visiting records	Annual	Program manager	Annual TS25 reports.
Outcomes	Implement projects related to green technology every year.	Total number of projects that have been done since 2018.	6 projects	7 projects	Programme reports	Annual	Programme manager	Annual TS25 reports.
Outputs	Workshop/ talk related to green technology.	Total number workshop/ talk related to green technology.	0	1	Programme reports	End of every PBL	Programme manager	Annual TS25 reports.
	Number of innovation or PBL implemented related to green technology.	Total number of innovation or PBL	1	1	Project reports	Annual	Project advisor	Annual TS25 reports.

9. Measurable achievement of the school's programme to students, teachers, parents, and wider community

1. Students – Based on number of students involvement in Green Technology programme, project based learning PBL and innovation.
2. Teachers – Based on number of teachers involvement in teaching innovation & PBL.
3. Parents – Based on numbers of parents involvement in communal work related maintaining the Taman Teknologi Hijau@19 site. The parents' association also helps financially for the maintenance of Taman Teknologi Hijau@19.
4. Community - Benchmark visit from schools across the country and educational institutions in and outside the country.
5. Private companies- Become a reference for Daikin Sdn Berhad to implement their hydroponic projects.

10. Plan for future

1. Expanding PBL and innovations related to Green Technology.
2. Extending the best practices to other schools throughout the country through benchmarking and networking.

11. Interrelationship of the school's programme with other Sustainable Development Goals (SDGs) (Please refer to page 2 in the Information Note or https://sustainabledevelopment.un.org/sdgs)

1. **2018 – Rain Harvesting project (H2OMES3@19)-** SDG 6: Ensure availability and sustainable management of water and sanitation for all.

2. **2019 – Aquaponic project (EZ-Aquaponic@19)-** SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

3. **2019 – Solar system installation (IdiqaSolar@19)-** SDG 7: focuses on the production of affordable and clean energy**.**

4. **2021 – Fertigation project (Projek Teknologi solar tanaman fertagasi PPKI)-** SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

5. **2021 – Innovation (EcoSmart Feeder: Integration in Aquaponic) –** SDG 12: Ensure sustainable consumption and production patterns.

6. **2022 – Innovation (Ecosmart Feeder 2.0: Integration in Aquaponic)-** SDG 12: Ensure sustainable consumption and production patterns.

7. **2023 – Innovation (Smart Feeder Kit)** – SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

8. **2023 – Innovation (Ecosmart Feeder 3.0: Integration in Aquaponic)** -SDG 12: Ensure sustainable consumption and production patterns.

12. Link(s) to the information of school's programme in social media platforms such as facebook, website, youtube

FACEBOOK SCHOOL : Sekolahku SKS19
https://www.facebook.com/BBA8222

Search post: #sks19towardsecoschool

PROJECT BASED LEARNING YEAR 4
PADLET
https://padlet.com/g82357762/projek-pbl-stem-tahun-4-4cl7foqxl1gyhxp6

13. Photos related to the activity/programme (Maximum of five (5) photos with captions in English)

Photo1

Rain Harvesting project (H2OMES3@19) - Student explains the rainwater harvesting process to visitors.

Photo 2

Aquaponic project (EZ-Aquaponic@19)- Principal and Headmaster Benchmarking Visit of School TS25 Cohort 7

Photo 3

Solar system installation (IdiqaSolar@19)- Explanation of the use of solar energy to the students of SKS19 by AmSolar engineers.

Photo 4

Fertigation project (Projek Teknologi solar tanaman fertagasi PPKI)- Students with special needs give an explanation about the fertigation system to the visitors.

Photo 5

(innovation Ecosmart Feeder 2.0: Integration in Aquaponic)- Participated in the International STEM Exhibition, Industrial Expo, Education Fair & Book Fair at SEAMEO RECSAM, Penang 2022.