



YAYASAN

# CONCEPT PAPER



**Regional Capacity Building workshop for Educators on  
climate change education through inquiry based  
science education (IBSE) pedagogy**



## Background

With a population of over 30 million, Malaysia is one of the most vulnerable countries to the impacts of climate change in the world. The country is expected to face severe extreme climate events, such as increased variability of monsoons, receding glacial caps, heatwaves, floods and droughts. To address this mammoth challenge, there is an urgent need for the adaptive capacity of communities through adequate science education and enabling citizens to make informed decisions in the context of climate change.

Science education plays a vital role to prepare societies for the future global challenges, including the climate change. Climate science education can be one of the essential components and a catalyst in deescalating the rate of climate change by raising awareness, promoting evidence-based research and knowledge. The climate change issues can be effectively dealt with a policy framework and political determination only if the decisions are based on scientific research data and rational judgment.

Today, the world faces enormous challenges and it will be extremely difficult for us to protect our environment and adapt to the climate change, improve our lives and feed our growing population, if we cannot invest in our children and youth. Therefore, we must provide students with requisite scientific skillsets at schools to expand their knowledge of climate science and empower them with right tools to protect this planet.

**“It’s important for me to have hope because that’s my job as a parent, to have hope, for my kids, that we’re not going to leave them in a world that’s in shambles, that’s a chaotic place, that’s a dangerous place.”**

**James Cameron, Film Director**





## Rationale

The Paris Climate Agreement 2015 encourages countries to promote and develop educational, training and public awareness programmes on climate change for a wider public discourse. Integrating climate change education into science curriculum is the most important step for strengthening climate change adaptation and mitigation. Unfortunately, the quality of basic science education being offered at schools is poor because of a number of reasons, which often does not develop the rational thinking among students. This demands us to do a tremendous amount of work to boost scientific literacy in the country.

A few countries have already undertaken possible measures to include a number of aspects of climate change in school curricula and in their respective national development agendas. For instance, the La main à la pâte (LAMAP) Foundation is a French organization based in Paris with a primary intent to improve the quality of teaching of science through inquiry-based approach at schools. LAMAP recently launched the Office of Climate Education (OCE) in Paris. The OCE aims to create a 'Global network of climate education' that raises the awareness of school children on the topic of climate change through interactive tools and research-based learning.

Considering the urgent need for capacity building of science educators in Climate Change Education, Green Growth Asia Foundation are planning to organize 5 days Training Workshop on Climate Change Education through Inquiry Based Science Education (IBSE).

The training will employ the Inquiry Based Science Education (IBSE) pedagogy, which adopts an investigative approach to teaching and learning. It is well recognized that IBSE is an effective tool for catalyzing Science, Technology, Engineering & Mathematics (STEM) education. IBSE methodology develops and strengthens students' skills of observation, asking questions, planning and conducting investigations, reviewing evidence in the light of what is already known, which leads to drawing conclusions and communicating the results.



## Inquiry Based Science Education

Basic knowledge in science as well as up-to-date technical know-how and innovativeness are indispensable for countries aspiring to be part of ever-growing global competition. A sufficient understanding of scientific theories and principles is requisite for the needs at the workplace and in daily life to fully gain the many benefits that science has to offer. Thus a good foundation in science among students serves as the basis for scientific literacy, promotes a better understanding of the environment and the world as well as the preparation of future scientists and technocrats.

Many developing countries are faced with basic issues in science education such as the shortage of qualified science teachers, lack of facilities including laboratories and equipment, and poor methods of delivery in the teaching of science subjects which tend to be teacher-centered and prescriptive thus leaving little opportunity for children for investigation and discovery leading to disinterest in the subject.

Concerned with these problems several countries have now embarked upon efforts together at the renewal of teaching science as early as at the preschool level. Science requires a teaching approach in which pupils are required to be actively engaged in carrying out inquiry and discovery and the use of evidence to formulate hypotheses and theories.

Learning by doing is based on personal investigation that helps pupils to develop cognitive processes as well as the sense of curiosity and creativity. Inquiry based activities allow pupils acquire new communication skills, through discussions in the classroom and with the teacher. Instead of the usual memorization and concentration of scientific concepts and formulas, IBSE insists on the appropriation of knowledge through individual investigation and questioning attitude leading the pupils to learn by experimenting in partnership with the teacher. Hence, the use of the hands and the brain lends itself as an appropriate teaching and learning strategy for science.





Considering the importance of science teaching at schools, Green Growth Asia Foundation (GGAF) has formulated a program of capacity building of teachers to gain and acquire technical support with reference to IBSE. It is pertinent to mention that the Foundation during the last two years has developed a good collaboration with Office for Climate Education, under under the auspices of UNESCO, La main a la pate Foundation France, ICLEI, Foundation for Environmental Education - a global network of 85 countries and Asian Development Bank (ADB). GGAF and OCE Global have signed a Memorandum of Understanding (MoU) sealing a new agreement to collaborate and work on ESD and climate education in South East Asia.



On 12th November 2022, H.E. Regent of Pahang Tengku Hassanal Ibrahim Alam Shah ibni Al-Sultan Abdullah Ri'ayatuddin Al-Mustafa Billah Shah chaired a meeting between all the parties in Sharm El Sheikh, Egypt during COP 27 to establish the partnership and develop a collaboration framework to spur the ESD agenda in Malaysia.



Thereby, the Foundation with the support of above mentioned collaborators taking an initiative to launch IBSE in Malaysia and organise a Capacity Building workshop in collaboration with Ministry of Education in Kuantan in year 2023. The workshop will be participated and contributed by 19 scientists, educationists, policy makers and global IBSE leaders from Paris and above mentioned international institutions and 80 young teachers and researchers from Malaysia.

## Purpose of the workshop

This training is primarily intended for young science teachers, especially women and teachers from marginalized areas of the country. The prime purpose of this training is to produce a cadre of science teachers who can effectively deliver training programmes on climate change education for their peers using IBSE pedagogy.

## Aims of the Workshop

1. To sensitize trainers on issues of climate change using IBSE as an approach to teaching climate change education;
2. To include climate change in teacher education (e.g. disaster risk reduction education, and aspects of policy planning and implementation) to ensure science educators can effectively communicate its significance to students;
3. To provide professional development opportunities for school teachers to ensure up to date knowledge about the climate change;
4. To enhance skills, understanding and competency of science teachers in IBSE in adult learning methodologies and understanding of scientific phenomena of climate change;
5. To enhance skills, understanding and competency of science teachers in order to assist teachers in implementing the approach; and
6. To provide the science teachers a solid framework for delivering training on climate change education

## Mode of Delivery

The training workshop will be delivered by using the combination of the following methods:

1. Series of lectures
2. Group discussions and presentations
3. Case Studies
4. Hands-on-activities and experiments

## Programme Overview



17th - 21st November 2024



Institusi Aminuddin Baki, Jln Institut Aminuddin Baki, Sri Layang,  
69000 Genting Highlands, Pahang

## Objectives



To enhance the understanding of educators (teachers, trainers, school directors) in Malaysia about climate change (origins, mechanisms, global and local impacts, adaptation, or mitigation solutions)



To enhance pedagogical skills in Inquiry Based Science Education (IBSE) and project-based pedagogy.



To provide the educators with a solid framework for producing locally relevant educational programs on climate-change.

## Participants

### Facilitators

<12

- 4 experts from the Office for Climate Education, with possible participation of local experts
- 1-2 education experts from Green Growth Asia
- 1-2 local scientists

### Educators

>80

Teachers from primary and secondary levels, teacher trainers, school directors) from Malaysia, & neighbouring countries especially belonging to the Eco-schools' network.

## Workshop Content

The workshop will cover scientific and educational issues related to climate education :

Climate system  
(global and local  
issues)

Climate and ocean  
(global and local  
issues)

Climate, agriculture, and biodiversity  
(global and local issues)

Teaching practices  
(active pedagogies);

Production of local  
projects

Soft skills and values related to climate  
education: emotions (eco-anxiety) and  
critical thinking.

## Eligibility Criteria

1. Bachelors of Science / Diploma in Education with more than 5 years experience in teaching in any STEM related subjects
2. Age: 45 years and less with over 5-7 years of teaching experience in any STEM Subjects. Female teachers are encouraged to apply
3. Eligible out-stationed participants will be provided accommodation, meals and transportation allowance (equal to road/bus fare)
4. Only qualified and shortlisted candidates will be invited for the participation. Successful candidates will be notified by July 31st, 2024.



## Partners



### Office for Climate Education

The Office of Climate Education (OCE) is a center under the auspices of UNESCO and an observing member of the Intergovernmental Panel on Climate Change (IPCC), devoted to support teachers as well as education systems with education resources, professional development, expertise and implementation of local projects. The OCE will oversee the design and animation of the workshop.



### ISTIC-UNESCO

ISTIC, the International Science, Technology, and Innovation Centre for South-South Cooperation under the Auspices of UNESCO is an international center, that focuses on enhancing cooperation in science, technology, and innovation among countries in the Global South. ISTIC will provide support in strategic partnerships and accreditation with entities related to areas in this workshop.



### Green Growth Asia Foundation

The Green Growth Asia Foundation is a non-profit organisation that provides a platform for leadership, thought and action in responding to sustainability challenges in Asia. GGAF is taking a lead in promoting a new growth strategy that strikes a balance between economic development, social inclusivity and environmental sustainability. GGAF will oversee the organization of the workshop (identification of the participants, communication, logistics) as well as its funding.



## Partners



MINISTRY OF EDUCATION MALAYSIA

### Ministry of Education

The Ministry of Education (Malay: Kementerian Pendidikan) is a ministry of the Government of Malaysia that is responsible for education system, compulsory education, pre-tertiary education, technical and vocational education and training (TVET), curriculum standard, textbook, standardised test, language policy, translation, selective school, comprehensive school. MOE will support in providing approval for teachers to join the programme as well as disseminate the invitation to nationwide teachers to apply and join the workshop.



### Amanah Lestari Alam (ALAM)

ALAM is a national initiative, initiated by the Ministry of Finance Malaysia and spearheaded by Bank Pembangunan Malaysia Berhad, with a vision to transform Malaysians' mindsets and behaviors regarding the environment. Rooted in the 12th Malaysia Plan, ALAM strives to raise awareness, educate, and foster a culture of whistleblowing through collaboration with communities, public, and private sectors. The initiative also advocates for improved governance policies and serves as a bridge between policymakers and stakeholders.

ALAM specifically targets three segments: primary school students, youths, and adults. By focusing on these groups, ALAM aims to reshape the relationship Malaysians have with the nation's natural capital, ensuring a sustainable future for generations to come. In support of its mission, ALAM will help mobilize transportation for the target groups involved throughout the events. This significant contribution will ensure smooth transitions and the successful execution of the initiatives, facilitating active participation and engagement from all involved.



# Proposed Tentative

## Regional Capacity Building Workshop '24

### VENUE & DATE:

Institusi Aminuddin Baki,  
Genting Highlands  
17th - 21st Nov 2024

Everyone will arrive and checking i into their rooms on **17th November** starting from 2 pm

## Day 1

8:00 - 8.30	<b>Introductory Briefing</b> Dr. Nanthini Jayaram
8.30 - 10.00	<b>Room 1 : Group A &amp; Room 2 : Group B</b> Workshop on Greenhouse Effect Initial Conception and Design and Experimentation
10.00 - 10.30	<i>Break</i>
10.30 - 12.00	<b>Room 1 : Group A &amp; Room 2 : Group B</b> Workshop on Greenhouse Effect Scientific Background
12.00 - 13.30	<i>Lunch Break</i>
13.30 - 15.30	<b>Room 1 : Group A &amp; Room 2 : Group B</b> Ocean & Climate Change Hands-on session & Scientific Backgrounds
15.30 - 16.00	<i>Coffee Break</i>
16.00 - 17.45	<b>Room 1 : Group A &amp; Room 2: Group B</b> Ocean & Climate (Acidification & Biodiversity) Hands-on session & Scientific Backgrounds
17.45 - 18.00	<b>Q&amp;A</b>



# Proposed Tentative

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17th - 21st Nov 2024

## Day 2

8:30 - 10:30	<b>Room 1: Group A &amp; Room 2: Group B Modeling Climate (Board Game)</b>
10:30 - 11:00	<i>Coffee Break</i>
11:00 - 12:30	<b>Room 1: Group A &amp; Room 2: Group B Workshop on Climate Justice</b>
12:30 - 14:00	<i>Lunch Break</i>
14:00 - 15:30	<b>Room 1: Group A &amp; Room 2: Group B Workshop on Eco-Anxiety and Emotion</b>
15:30 - 16:00	<i>Coffee Break</i>
16:00 - 17:30	<b>Room 1: Group A &amp; Room 2: Group B Extreme weather events</b>
17:30 - 18:00	<b>Multimedia Animation on Urban Heat Island Effect</b>



# Proposed Tentative

## Regional Capacity Building Workshop '24

### VENUE & DATE:

Institusi Aminuddin Baki,  
Genting Highlands  
17th - 21st Nov 2024

### Day 3

8:00 - 10:00	<b>Room 1: Group A &amp; Room 2: Group B COP Simulation</b>
10:00 - 10:30	<i>Coffee Break</i>
10:30 - 12:30	<b>Room 1: Group A &amp; Room 2: Group B COP Simulation</b>
12:30 - 14:00	<i>Lunch Break</i>
14:00 - 17:30	<b>School Visit</b>
17:30 - 17:45	<b>Q&amp;A</b>



# Proposed Tentative

## Regional Capacity Building Workshop '24

### VENUE & DATE:

Institusi Aminuddin Baki,  
Genting Highlands  
17th - 21st Nov 2024

## Day 4

9:00 - 10:30	<b>Evaluation and Resources Presentation</b>
10:30 - 11:00	<b>Coffee Break</b>
11:00 - 12:30	<b>Closing Ceremony</b>
12:30 - 13:30	<b>Lunch &amp; Checking Out</b>

# Trainers



David Wilgenbus

Chief Executive Office at the Office for Climate Education

An astrophysicist by training, I have worked for 17 years (2001-2017) as head of educational resources for the La main à la pâte Foundation. I have coordinated several large-scale educational programs on sustainable development (climate change, housing, mobility, health, natural disasters...) and science (computer sciences, astronomy), which have been implemented in more than 100,000 classes in France and abroad. My expertise lies in science teaching and education for sustainable development; in particular, the design of pedagogical projects and teacher training. In 2017, he coordinated a feasibility study for an international initiative for climate change education, which led to the creation of the Office for Climate Education in 2018.

Dr. Adeline Aroskay  
Science Officer at the Office for Climate Education

Adeline Aroskay, a Doctor in Earth Sciences from ISTeP, Sorbonne University, Paris (2020), specializes in the fate of volcanic sulfur gases in the atmosphere. With a degree in Life, Earth, and Universe Sciences, she has taught geosciences at higher education institutions and prepared students for CAPES and SVT aggregation competitions. Passionate about improving educational practices and addressing environmental and climate change issues, Adeline joined the OCE in August 2023 as a scientific mediator. At the OCE, she leverages her research and educational background to produce resources, train teachers, and support national and international educational projects.



# Facilitators



Balamurugan Ratha Krishnan  
Chief Executive, Green Growth Asia Foundation

Balamurugan has extensive expertise in regional economic integration and cooperation, with multi-sector experience in agriculture, tourism, halal products, transport, ICT, trade, environment, and human resource management. As a seasoned programme manager, he has designed and implemented multi-dimensional projects across sectors, stakeholder groups, and countries. His deep knowledge of regional development policies and regulatory frameworks enables him to guide negotiations effectively. His focus on Results-based Monitoring ensures tangible outcomes and impacts.

Sri Themudu Bully Baboo  
Chief Programme Officer, Green Growth Asia Foundation

Sri Themudu, Chief Programme Officer of Green Growth Asia Foundation (GGAF), leads transformational change in GGAF's Sustainable Education Pathway through advocacy and partnerships. He oversees program development, including outreach and job training for young people and teachers. Sri holds a Master's in Entrepreneurship from the University of Otago, New Zealand, as a recipient of the prestigious New Zealand ASEAN scholarship, and has completed the Sustainable Urban Development programme at Erasmus University Rotterdam.



Muhammad Fadzly Bin Me'an  
Education Officer

Fadzly, a passionate education enthusiast, brings valuable expertise to effectively engage with diverse segments of society. He is an Education Officer at Green Growth Asia Foundation where he consistently committed guiding the schools in developing the best sustainability practices. He completed the Climate Change Education course in 2023.



Nurul Najaha binti Rosman  
Education Officer

Nurul Najaha, an Education Officer at Green Growth Asia Foundation, where she is teaching and guiding schools in sustainability practices and developing policy and guidelines for schools. She completed the Climate Change Education Course in early 2023.





# COLLABORATIVE TASKFORCE

We are committed to bringing everyone together for this program, believing that by leveraging each individual's strengths, potential, and unique expertise, we can maximize the program's efficiency. Below is a detailed overview of the collaborative team dedicated to supporting and driving the success of this initiative.

Participants Relations, Event Promotion & Program Execution	Green Growth Asia Foundation	
Finalizing Trainers, & Food Expenses	ISTIC	
Trainers & Training Module	Office of Climate Education	
Trainers Airfare	Amanah Lestari Alam	
Teachers Participation Marks	Teacher Professionalism Sector, Ministry of Education Malaysia	

Together, this cohesive and dedicated team will ensure that every aspect of the program is executed with precision and effectiveness. By harnessing our collective expertise and working collaboratively, we are confident that we can achieve our goals and create a meaningful impact. We look forward to the success of this initiative and the positive changes it will bring to our community.

# ABOUT US



Young Reporters  
for the environment

Young Reporters for the Environment (YRE) is an award-winning international programme coordinated by Foundation for Environmental Education (FEE). Green Growth Asia Foundation (GGAF) as the national operator for YRE Malaysia organises the NYRE Competition, a national initiative to empower Malaysian youths to take an educated stand on environmental issues they feel strongly about and gives them a platform to articulate these issues through the media of writing, photography or video.



GGAF is a nonprofit organisation. We provide a platform for leadership, thought and action in responding to sustainability challenges in Asia. It is taking a lead in promoting a new green growth strategy that strikes a balance between economic development, social inclusivity and environmental sustainability. Asian Development Bank (ADB) and ICLEI South Asia have played a catalytic role in the formation of Green Growth Asia Foundation (GGAF). ADB believes GGAF will fill the knowledge and green growth project implementation gap that they perceive exists.



Green Growth Asia Foundation (GGAF) was incorporated through Suruhanjaya Syarikat Malaysia (SSM) on 12 March 2018 1271638-X. GGAF operates as a nonprofit foundation or 'yayasan' with tax exemption status for its operations.

## OUR PAST PARTNERS



INTERNATIONAL SCIENCE, TECHNOLOGY AND  
INNOVATION CENTRE FOR SOUTH-SOUTH  
COOPERATION UNDER THE AUSPICES OF UNESCO



