

# Communicating Science for Climate Action

## Report

**2021**



ORGANISED BY



British  
High Commission  
Kuala Lumpur

IN PARTNERSHIP WITH



UK Science  
& Innovation  
Network



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# Foreword

Today, we live in a digital age where access to vast amount of information has never been easier and more convenient. Despite this, there is a pattern of science-related issues such as climate change being not effectively communicated to the general public. So, ironically in this information age, we need better communication tools and tactics to disseminate science-based information accurately and more concisely for public understanding.

In February 2021, the British High Commission Kuala Lumpur (BHC) along with EcoKnights, launched the Communicating Science for Climate Action programme, with two main objectives: Firstly, to enhance public understanding of climate change factors and impact through the projects of five selected grassroots Malaysian groups/organisations. Secondly, to gain insights into effective science communication tools/methods to improve understanding of climate change-related information.

So, the first half of the report highlights Malaysian public knowledge, attitudes, and perception towards climate change and general science communication awareness, through data collected through a survey we conducted. The second half of the report details the projects executed by the selected grassroots Malaysian groups, including their effectiveness as reported by the target beneficiaries.

Throughout the report, a common theme that cuts across the programme findings is the need for communicators to be more attuned to the type of communication tools and to ensure that the techniques adopted are appropriate and localised for the target audience.

And the most important conclusion is that if we want to see greater climate action amongst the Malaysian public and communities, we must find ways of effectively communicating the robust scientific knowledge, literacy, and understanding which people need. That is a task for all of us who want to see the kind of ambitious climate action we will need if we are to prevent a climate catastrophe on our planet.

**H.E. Charles Hay, MVO**

British High Commissioner to Malaysia.

**Fadly Bakhtiar**

Programme Director of EcoKnights.

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# Executive Summary

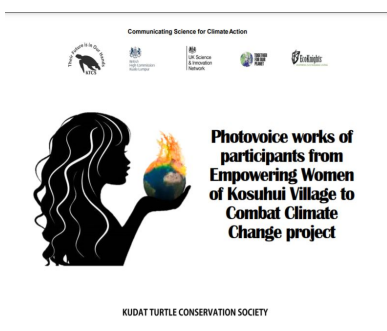
The act of providing information, education, awareness raising and scientific discovery and demonstration on science-related topics is called scientific communication. Science communicators and audiences are vaguely defined, and the expertise and level of scientific knowledge varies from group to group.

The British High Commission Kuala Lumpur (BHC), supported by EcoKnights, launched the Communicating Science for Climate Action program in February 2021 with the participation of 5 Malaysian grassroots groups or organizations (in no particular order) Malaysia Media Science Center, Kudat Turtle Conservation Society, DeRiA, University of Malaysia and University of Nottingham in Malaysia, and Time to Rice; (also known as program grantees).

Each organization was chosen as the grantee for different themes. They are as follows:

- Ocean and Climate Change - Kudat Turtle Conservation Society
- Land and Climate Change - Time to Rice
- IPCC Reports on Global Warming (For Teachers/Educators) - University Malaya and University of Nottingham Malaysia
- IPCC Reports on Global Warming (For Teachers/Educators) - DeRiA
- IPCC Reports on Global Warming (For Media Communities) - Science Media Centre Malaysia

Below are the **key takeaways** from each project:



## ***Kudat Turtle Conservation Society***

Kosuhui women are potentially more conscious about their future actions and more willing to change, and educate the younger generations to be more aware of local climate effects. It is greatly recognized that educating these women is crucial, as they are one of the key local marine resource users, but are yet to be given priority in local marine resources management.

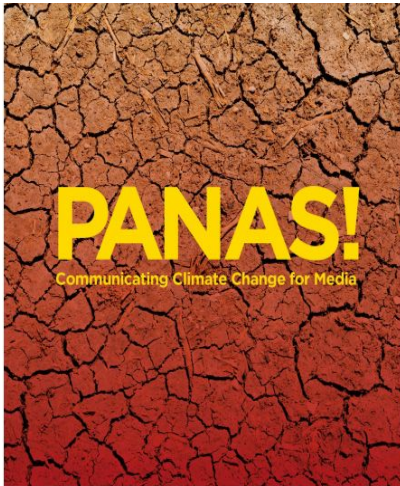


**TIME TO RICE:**  
Co-creating & Gamifying  
Climate Science Communication Workshop  
Documentation Report

## ***Time to Rice***

Gamification of supply chains is a great tool for education and awareness raising through learning-by-playing, and provides more specific ways for young adults and youth to learn about environmental and climate related topics.

# Executive Summary

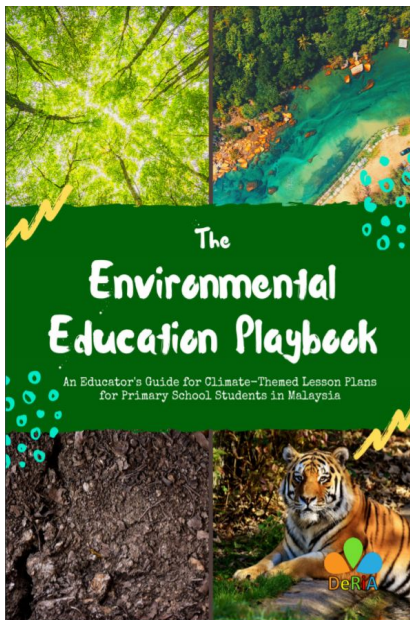


SCIENCE  
MEDIA  
CENTRE  
MALAYSIA



## *Science Media Centre Malaysia*

In the face of climate change, journalists and content creators increasingly play a major role in helping accelerate climate action through advocacy and education. Through this PANAS! project, the beneficiaries/participants are empowered through the workshops and communications-related activities. The platform is provided for them to write about the topic of climate change which normally would not get much attention from local editors/media outlets.



## *DeRiA*

DeRiA utilizes science communication techniques through basic EE awareness-based teaching activities in Malaysian schools to boost the interest and commitments of young people, primarily those within the age 7-12 years old. The Environmental Education Playbook was published and was highly regarded among participating teachers, educators, and researchers - further highlighting the importance of the Playbook as an effective environmental resource in schools.

## *University Malaya and University of Nottingham Malaysia*

Through designated modules, entertaining byte-size materials, and interactive social media campaigns, program participants as well as the general public were receptive to the climate-centric content and had a greater understanding of climate change and environmental issues, locally and globally.



# At A Glance

23.4%

have a Very Good  
knowledge and understanding of climate  
change drivers and impacts

70.28%

have an extensive  
knowledge and understanding of COVID-19  
pandemic

## Public Understanding and Knowledge of General Science

2.86%  
Very Good

Scientific Literature

1.17%  
Very Good

Climate Change

8.00%  
Very Good

COVID-19 Information

## Communication Materials Produced by Program Grantees



Byte size materials including:

- Videos & Tiktok
- Infographics
- Quizzes
- Podcasts
- Reading list & resources



- E-photobook of Photovoice work featuring the Kosuhui women
- Climate Change Witness Stories (Interview Videos)

**SCIENCE  
MEDIA  
CENTRE  
MALAYSIA**

- PANAS! Communicating Climate Change for Media Digital Toolkit



- Environmental Education Playbook using Multisensory Learning Approach

- Gamification workshop Template, Manual and Report for public use
- Infographics





# 1.0 Introduction



Science communication is the linguistic process of informing, educating, and enhancing cognitive understanding of science-related topics, discoveries and arguments<sup>1</sup>. Science communicators and audiences are ambiguously defined, and the expertise and level of science knowledge varies among these groups. In today's world, science communication is vital to society<sup>2</sup> in order to effectively communicate technical information, and to spread awareness about science related matters accurately.

The tools and tactics that are being used in communicating science-related issues such as climate change are hugely significant. Either as an advocate, a scientist or a regular citizen, science-based information can and will affect the way people understand and think about both the problem and solution of the subject matter. Not only does science communication raise awareness about the climate-affected issues, this understanding can influence a behavioural change among individuals to take climate-driven actions for a greater purpose.

The British High Commission Kuala Lumpur (BHC), supported by EcoKnights launched the Communicating Science for Climate Action program in February 2021 with participation by five grassroots Malaysian groups or organizations (in no particular order) - Science Media Centre Malaysia, Kudat Turtle Conservation Society, DeRiA, Universiti Malaya & University of Nottingham Malaysia, and Time to Rice; (also known as the program grantees).

The program aims to enhance understanding and awareness of the drivers and impacts of climate change among various stakeholders in Malaysia, comprising targeted communities of the program, as well as the general public. With the drive to accentuate science and innovations available to tackle climate change, the five grantees were selected among science communication experts and enthusiasts in Malaysia. They proposed and implemented projects that directly and effectively communicate climate change science information and knowledge to their targeted beneficiaries and/or communities. The grantees received further input, guidance and recommendations from field experts and researchers who work in their respective climate spheres for their project delivery.

Science communication plays a key role in forming the foundation of knowledge and understanding of climate change. This then contributes to the development of effective approaches to address this crisis. While science-backed information about climate change is widely available, the level of uptake and understanding on it differs across stakeholders. Ensuring effective communication of climate science for credible climate action, especially to those who have a key role in pivoting action for climate change, is a critical step in the fight against climate change.

<sup>1</sup> LibGuides: *Science Communication: Introduction to science communication*. (2019, May 8). Science Communication.

<sup>2</sup> Jucan, M. S., & Jucan, C. N. (2014). The Power of Science Communication. *Procedia - Social and Behavioral Sciences*, 149, 461–466.



# 2.0 Communicating Science for Climate Action Survey

As a component of this project, the Communicating Science for Climate Action survey was conducted, involving the Malaysian public for a duration of one month (May - June 2021). The survey aimed to better understand the knowledge, attitudes and perception of the public towards climate change and general science communication knowledge and awareness. A total of 175 respondents took the survey, primarily from the Kuala Lumpur, Selangor, and Johor regions.

By providing a diverse range of views on the matter, the survey seeks to gather information to strengthen science communication strategies, techniques, and innovations to tackle these issues in the future, and to deliver climate change messages effectively to the general mass. From this report, we hope these findings could provide valuable insights towards advancing the public's understanding of climate change and improve the use of science communication across different audiences.

## 2.1 Understanding of Climate Change

The first step to better understand how to strengthen science communication strategies and techniques is by identifying the **awareness levels of climate change** among the target audience. Figure 1 and 2 depicts the understanding on the **impacts and drivers of climate change** among the survey respondents.

**Youths are the majority who self-reported to have “good” understanding of climate change**

Figure 1 illustrates that over half (50.3%) of the survey respondents self-reported to have a good understanding on climate change, with 23.4% indicating that they have a very good knowledge and understanding.

This is consistent with other reports that surveyed youth's perception (16 years and above) of climate change. The findings from the National Youth Climate Change Survey Malaysia<sup>3</sup> indicated a similar trend of 16-30 years old individuals self-reported to have a fairly good understanding of climate change with 60.2%, while 11.9% of them self-reported to be very good.

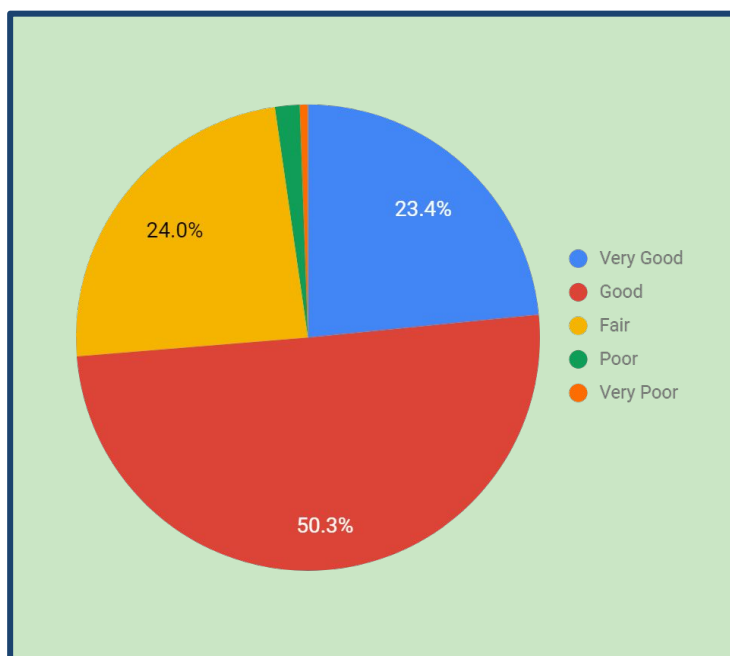
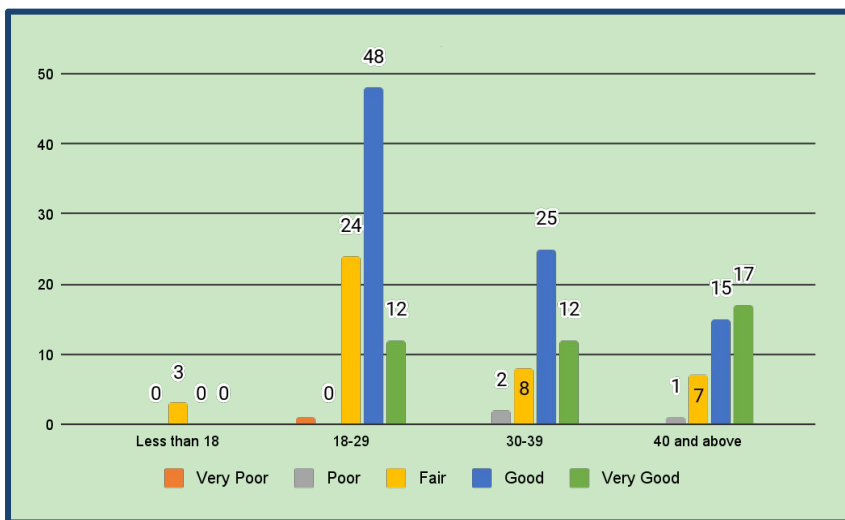


Figure 1. Self-reported Knowledge and understanding of climate change drivers and impacts

<sup>3</sup> UNDP, UNICEF, & EcoKnights. *Change for Climate: Findings from the National Youth for Climate Change Survey Malaysia* (Putrajaya, 2020)

# 2.0 Communicating Science for Climate Action Survey



*Figure 2. Self-reported Knowledge and understanding of climate change drivers and impacts by age group*

**18-29 years old individuals cover the majority 50.3%**

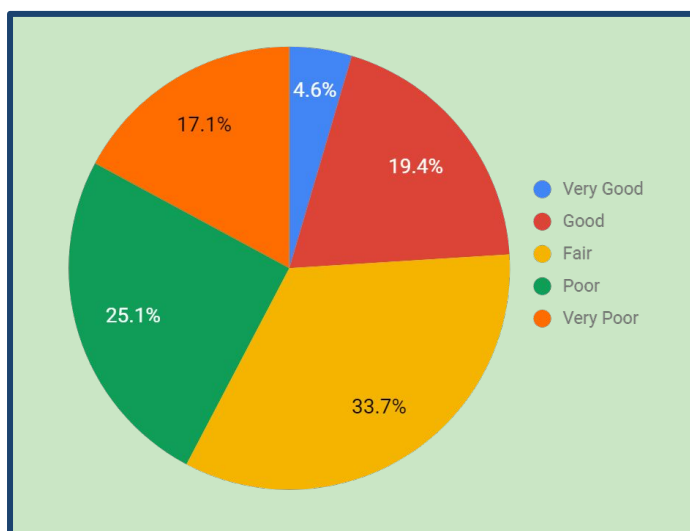
Figure 2 depicts the different age groups among the respondents. The majority (27.43%) of respondents who self-reported to have a “Good” understanding of climate change are within the 18-29 age group, followed by those within the 30-39 age group with 14.29%, and 8.57% are those who are above 40 years old.

Respondents also rated their level of knowledge and understanding on the **Intergovernmental Panel on Climate Change (IPCC)** reports and its content - developed by the United Nations. Findings seen below:

**Over 75% of respondents have fair to very poor knowledge of the IPCC Reports**

Although a majority of the respondents have a good understanding of climate change, Figure 3 reveals that a lower percentage of respondents have a good (19.4%) and very good (4.6%) understanding of the IPCC reports respectively.

This is further depicted when most respondents only have a fair to poor understanding (33.7% and 25.1% respectively) of the IPCC report, suggesting that even when 50.3% of respondents self-reported to have good understanding of climate change, less than 20% understand the IPCC reports and its content.



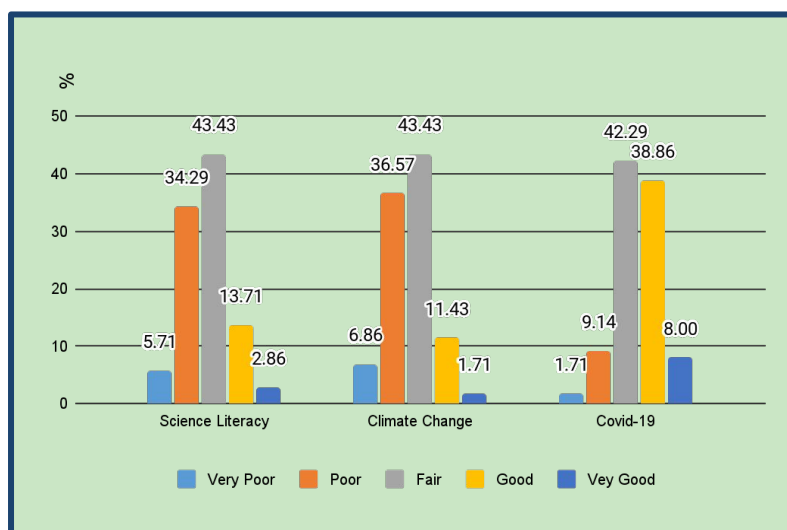
*Figure 3. Knowledge and understanding of IPCC Reports and its content*

These findings further supports that climate change issues in mainstream media have little to no direct reference to the IPCC reports. This is reported in 2.2 (Source of Information).

# 2.0 Communicating Science for Climate Action Survey

These findings further supports that climate change issues in **mainstream media have little to no direct reference to the IPCC reports**. This is reported in 2.2 (*Source of Information*).

Figure 4 displays the respondents' assessment on the **public's knowledge regarding science literacy, climate change, and COVID-19** respectively. This section aims to identify the areas that the respondents believe the public has the best understanding in, and to thereafter assess **factors that may affect the higher or lower understanding of certain science topics**.



*Figure 4. Assessment of general science literacy, climate change knowledge and COVID-19 perceptions among the public*

A majority of the respondents perceived that the general **public has fair science literacy, and climate change knowledge**, with **43.43%** respectively, while they think that the **public's knowledge of COVID-19 related issues is mostly fair (42.29%) to good (38.86%)**.

This also depicts a higher level of percentage for those who understand COVID-19 related issues compared to science and climate change knowledge, as **less than 20% of the respondents** discerned that the **public has a fair to good understanding** of science literacy and climate change knowledge respectively.

This higher level of perceived knowledge among the public on COVID-19 could be due to several factors. Firstly, there is a surplus of information widely available for the public on COVID-19. Furthermore, information on the pandemic is presented through a variety of formats such as infographics, audiovisual means, posters etc., which may appeal to and engage with a wider and more diverse target audience in Malaysia.

In addition, although climate change is already being communicated through different techniques, the discrepancy in knowledge level could be owed to the greater sense of urgency that the public feels regarding COVID-19 as opposed to science- and climate-related topics. This could then result in a lower level of interest in learning more about climate change among the general public. Moreover, the public could potentially view COVID-19 as an immediate health threat, rendering higher priority and urgency.

# 2.0 Communicating Science for Climate Action Survey

## 2.2 Source of Information

In this section, survey respondents reported their **main source of climate and science information**. By gathering data on which channels are more utilised, this can help to share more reliable climate-related knowledge as well as increase audience reach on the appropriate platforms.

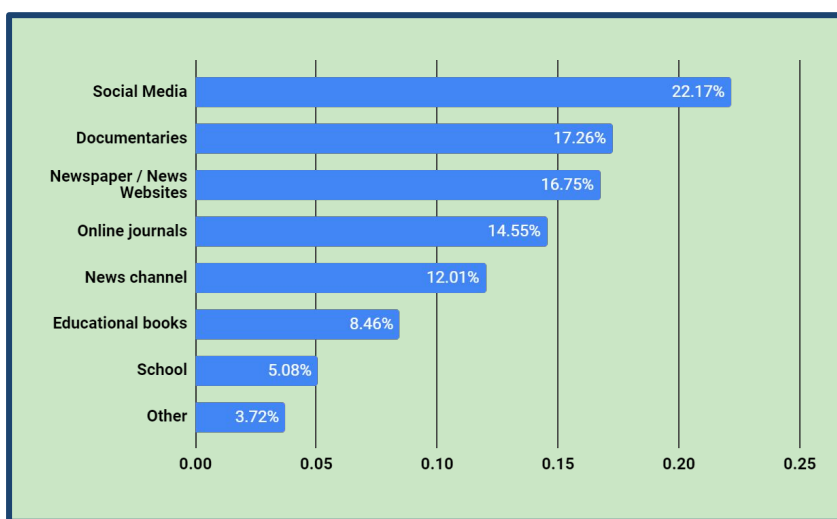


Figure 5. Source of climate change and science information

Over 15% of the respondents have selected **documentaries and newspaper/news websites** as their source of information for science and climate change, respectively. This indicates the use of digital (audio/visual) means among our respondents.

**22.17%** of the respondents have selected **social media** as their main source to receive science and climate change information, which further highlights the digital connectivity and tech proficiency among survey respondents.

The 2020 National Youth Climate Change Survey Report<sup>4</sup> depicted a similar trend of Malaysian youths choosing social media as their primary source of information. While social media and digital means of receiving information enables greater access to a range of news sources and provides a platform for the Malaysian public to engage in climate change discourse, it is crucial to be aware of misinformation easily spread online (fake news). This is evident from the numerous fake news surfacing online, both globally and locally, about science-related information such as the COVID-19 virus.

This highlights the importance of providing reliable science and climate change information/sources that are adequately evidence-based and scientific for the general public, as well as utilising effective science communication strategies to do so. Under this Communicating Science for Climate Action program, one of the project grantees - a team of experts from Science Media Centre Malaysia - has developed a toolkit<sup>5</sup> for journalists, writers, and content creators as a guide to effectively write about environmental and climate change issues in a local context.

<sup>4</sup> UNDP, UNICEF, & EcoKnights. *Change for Climate: Findings from the National Youth for Climate Change Survey Malaysia* (Putrajaya, 2020)

<sup>5</sup> Science Media Centre Malaysia. *PANAS! Climate Change Stories in Malaysia* (Kuala Lumpur, 2021)



# 2.0 Communicating Science for Climate Action Survey

## 2.3 Science Communication & Climate Change

This section aims to detail **science communication within the context of climate change**. While we receive information from a vast array of sources on this topic, the respondents have shared their views on who they believe should communicate technical content to the general public.

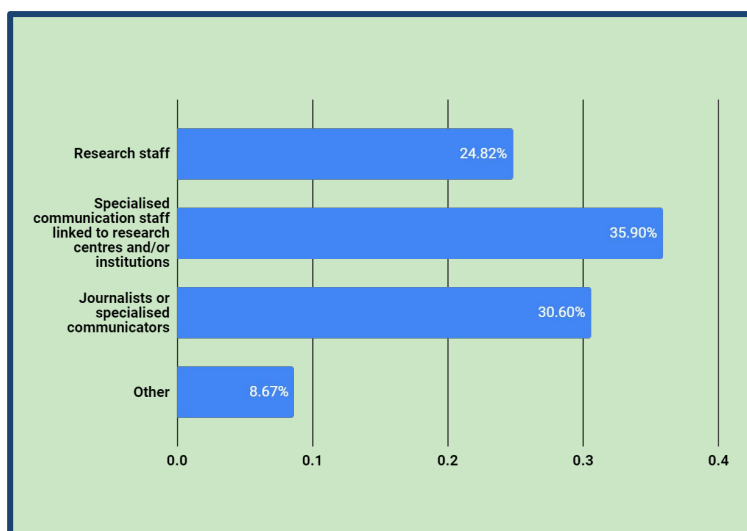


Figure 6. Communication of climate change and science information

A majority of survey respondents (35.9%) agree that **specialised communication staff linked to research centres and/or institutions** should be the ones to communicate and deliver information about science and climate change. 30.6% of respondents picked **journalists or specialised communicators**, while 24.82% picked research staff.

This shows the importance of having specialised science communicators who are aware and has expertise on the methods, techniques, strategies and innovations available to effectively deliver science and climate information to different audiences.

Figure 7 outlines the topics of interest in climate change, chosen by the survey respondents. A majority of them (36.57%) chose **climate and environmental education**, with 25.71% of them choosing **economy and environment** as topics of interest.

Malaysian public has exponentially become more aware and vocalized in climate movements over the years, especially among the younger generation. Under this Communicating Science for Climate Action program, two program grantees - DeRiA and experts from Universiti Malaysia and University of Nottingham Malaysia - have developed climate- and environmental-themed educational resources.

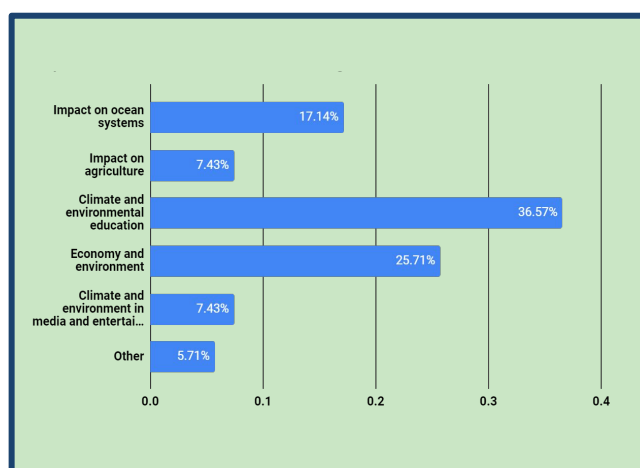


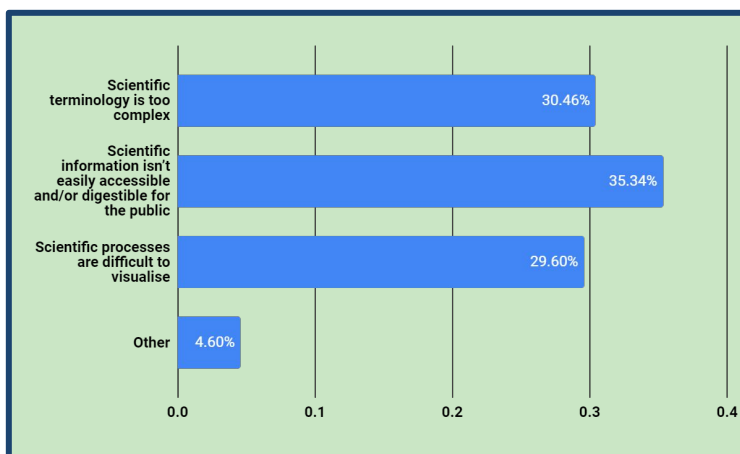
Figure 7. Topics of interest regarding climate change and environment

# 2.0 Communicating Science for Climate Action Survey

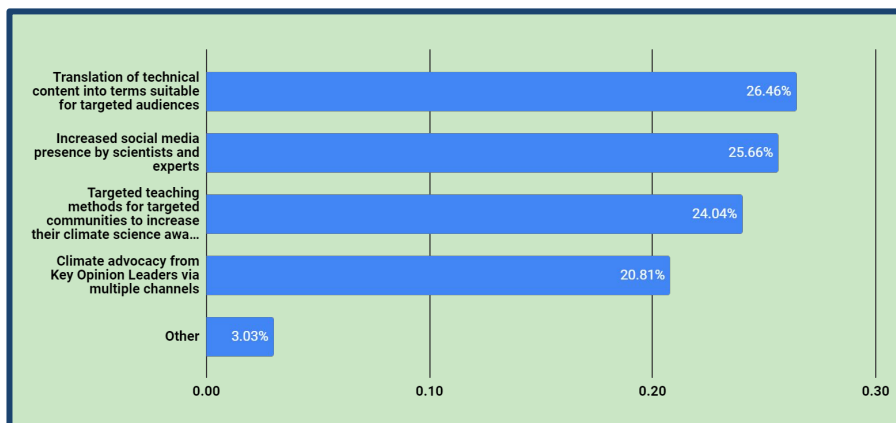
## 2.4 Science Communication Methods

This section reports the **challenges** faced by respondents **in understanding scientific information**, and the proposed methods to tackle scientific information communication challenges.

**Figure 8** demonstrates that **35.34%** of respondents have agreed that **scientific information is not easily accessible, nor is it digestible** for the general public. **30.46%** of respondents also state that **scientific terminology is too complex** for the general public, which might hinder understanding for the public on all levels of knowledge. **29.60%** of respondents have stated that **scientific processes are too difficult to visualise**.



*Figure 8. Challenges in understanding scientific information among the public*



*Figure 9. Methods to tackle scientific information communication challenges*

**Figure 9** displays that a majority of the respondents (**26.46%**) agree that **translation of technical content** from the IPCC reports into terms suitable for target audiences would be an **effective way** to narrow the gap between the general public and climate change scientists and experts.

# 2.0 Communicating Science for Climate Action Survey

Survey respondents provided **recommendations on tackling science communication challenges**. The findings detailed a variety of responses, with **key responses** grouped and seen below:

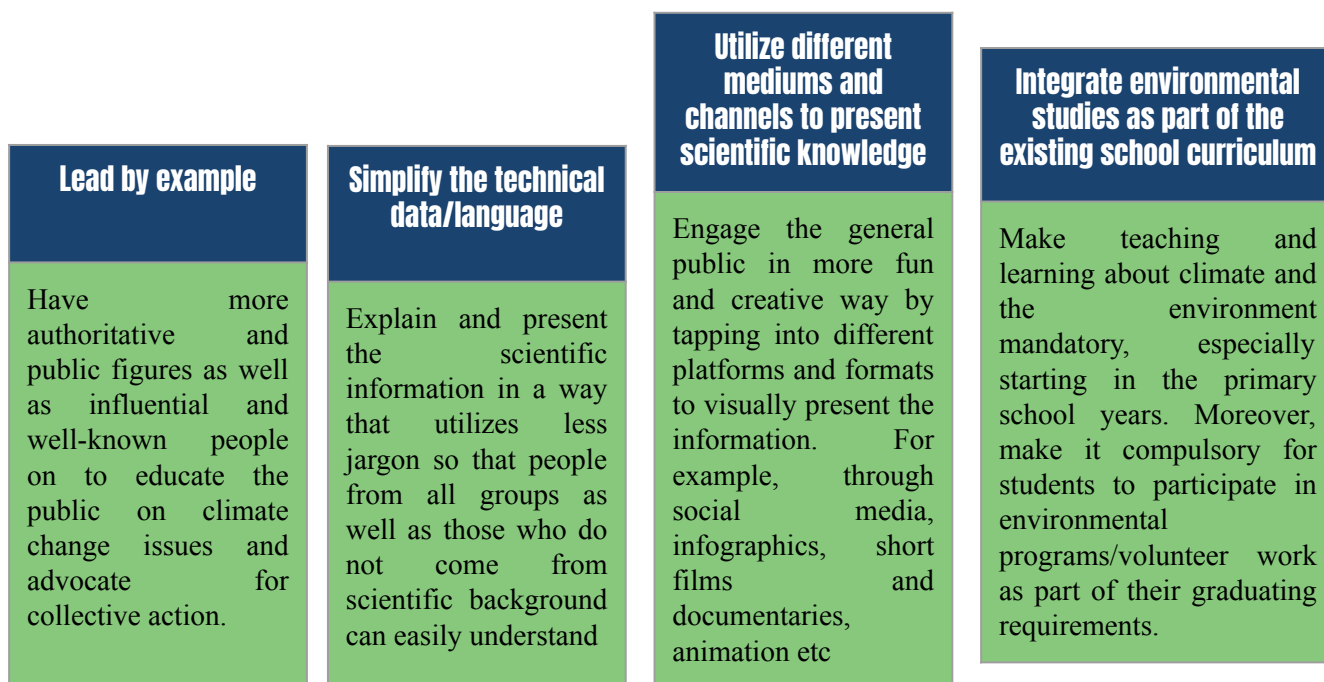


Figure 10. Grouped responses on methods to tackle scientific information communication challenges

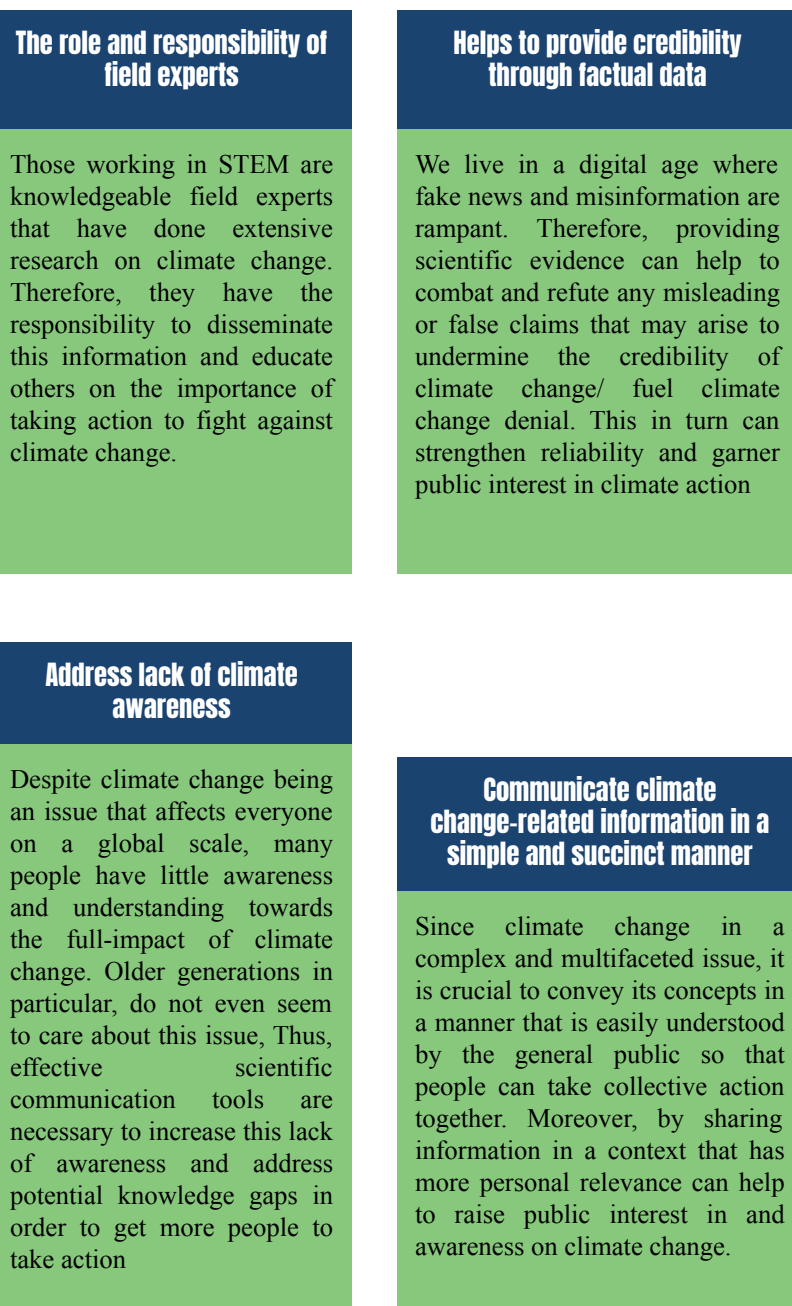
“  
*A more concerted effort by business, academia and government together [are needed].*

””  
*Information needs to be condensed into more digestible and bite-sized forms. Use of infographics or “explainer videos” would be most effective to engage with audiences who have fleeting attention spans.*”

“  
*Use less jargon and more analogy to help the public relate to the topic.*

# 2.0 Communicating Science for Climate Action Survey

This section details the importance of expert engagement in the science and climate fields with targeted communities. The key responses have been extracted and are as grouped below:



**Figure 11. The importance for experts to utilise effective science communication techniques to engage with the general public and targeted audiences**

“  
*It is necessary for the public to understand basic science and climate change concepts because it will affect everyone on a global scale.*  
 ”

“  
*Those working in STEM are experts in their field and thus, they are the best options available for sharing/delivering their research, knowledge and ongoing activities relevant to the problem statement.*  
 ”

“  
*[It's necessary] so that the general public would not be easily influenced with any false information and would have extensive reliability on the knowledge they receive from the authorities involved.*  
 ”

“  
*[Expert engagement] can bridge the gap between complex reports/journals with more simplified, targeted information to the suitable beneficiaries/groups.*  
 ”



# 2.0 Communicating Science for Climate Action Survey

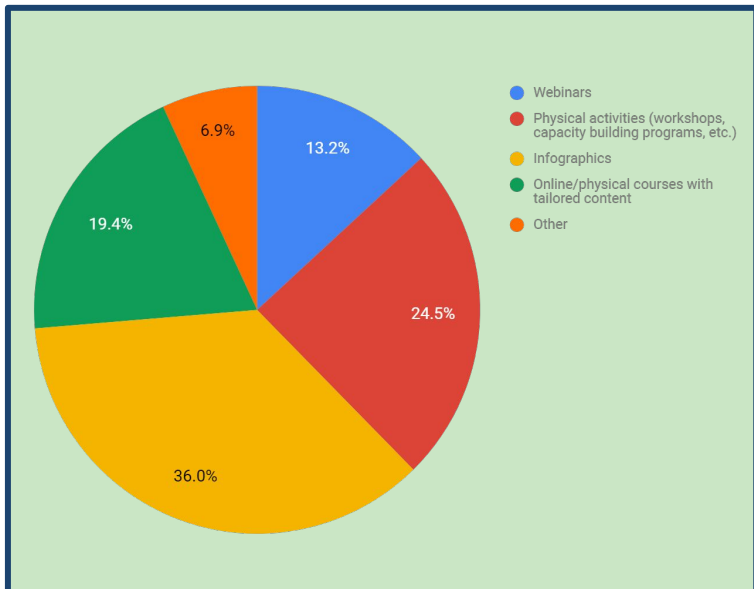


Figure 12. Potential methods used to tackle challenges in science communication

When asked to suggest different techniques that could be useful for the public to better understand science and climate change, the majority of respondents (36%) suggested **infographics** as a way to better engage and communicate scientific information. **24.5%** suggested **physical activities** such as workshops and capacity building programs, while **19.4%** suggested **online or physical activities with content tailored** to the target audience.

This indicates that **close to 45%** of the respondents prefer to **participate in hands-on activities** either done physically or virtually to gain information and learn about science communication. Meanwhile, **36%** of respondents chose **infographics as an effective option** to communicate scientific information and concepts, highlighting the importance of eye-catching, engaging and succinct visual graphics to translate technical and scientific information into content more digestible for the public.

## 2.5 General Science Communication and COVID-19

The final section of the survey sought to understand the **public's ability to comprehend and digest general scientific information**; in particular, this segment was designed to assess the **public's capacity to understand information regarding the current global COVID-19 pandemic**.

The majority of respondents (**70.28%**) have stated that they have **extensive knowledge** on COVID-19 origins, while **22.86%** believe that they have **moderate knowledge**.

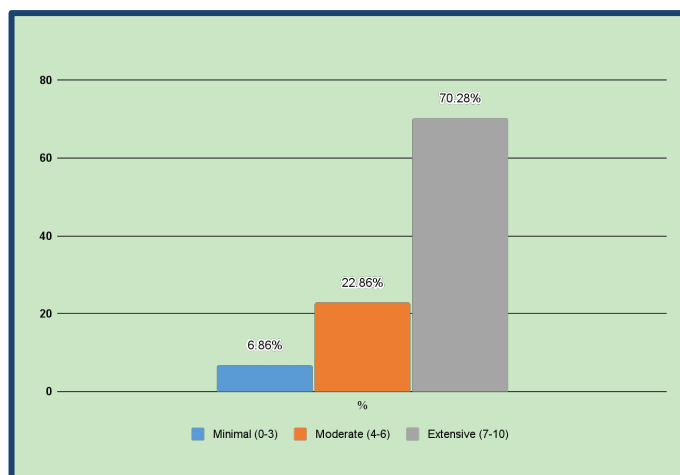


Figure 14. Knowledge on COVID-19 pandemic

**65.14%** of the respondents have self-reported to face little to no difficulties in understanding the science behind the COVID-19 pandemic, in particular, the virus, vaccine, variants, reason behind SOPs, etc. while **26.86%** have reported to have a moderate level of difficulty in understanding, and **8%** have stated that they find difficulty in understanding.

# 2.0 Communicating Science for Climate Action Survey

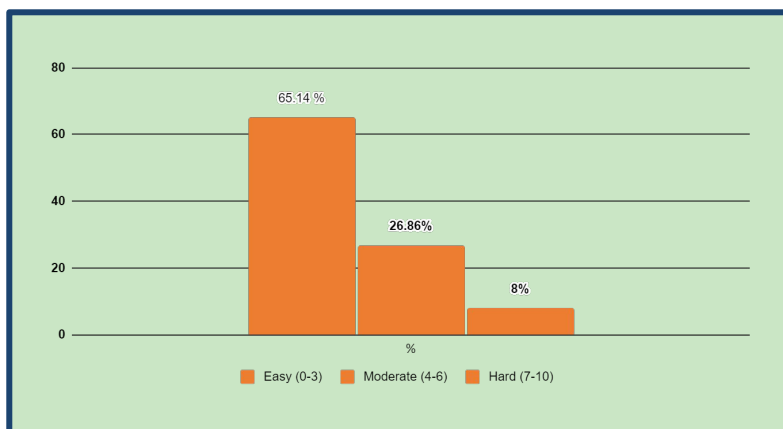


Figure 15. Difficulty in understanding science behind the pandemic

Here, it is reported that the respondents have **high level of understanding about the COVID-19 pandemic**, potentially attributed to the amount of information that is easily accessible both online and physically.

The Health Ministry of Malaysia has been consistent in providing daily reports, updates, and health statuses relating to the coronavirus through various communication mediums including press conferences, media coverage by local news outlets, social media updates, infographics, PSAs (e.g. bite-size videos, radio & TV commercials), and more.

The survey respondents have provided insights on their understanding and opinion behind the non-pharmaceutical interventions during the COVID-19 pandemic, such as social distancing, mask-wearing, lockdowns, etc. The responses have been grouped and are as shown below:

“

*This helps reduce contact between people and can help flatten the curve of those infected by COVID. It is more of a preventative measure than a solution. However, it is only helpful if everyone complies to this and not just a select few.*

”

“

*State governments often assume that these interventions are meant to protect individuals from eternal harm, but it's more about protecting those from around you which is not communicated well. Hence, many people who flout these rules often discount their own actions as "I'll take the risk" when in fact they are also risking the lives of their loved ones too.*

”

## Helps to reduce COVID-19 transmission and incidence rates

Many understand the need for non-pharmaceutical interventions during the COVID-19 pandemic as preventive measures meant to help and minimise the spread of and exposure to the virus. These interventions in place are for more than simply protecting oneself, they are meant to help protect highly vulnerable groups against the impacts of COVID-19.

## Greater need for public compliance

These measures are only effective if there is nationwide compliance and cooperation. Stricter enforcement of these interventions may be needed as it remains a challenges amongst the general public to comply with these rules and regulations.

Figure 16. Public understanding on the use of non-pharmaceutical interventions during the COVID-19 pandemic

# 2.0 Communicating Science for Climate Action Survey

This section reports the **respondents' perception of the role of the vaccine in tackling the pandemic**, with a range of answers summarized into key ideas as seen below:

## Builds people's immune system to reduce the severity of the virus

“The vaccine does not mean complete immunity against COVID-19. Instead, it helps to create antibodies in the body to fight against the intrusion of the virus and minimize its effects. Thus, this can help to reduce the chances of being hospitalized and the chances of death.”

## Generate herd immunity against the virus

“As more people get vaccinated, this can help to reduce infection and death rates of the virus, eventually enabling the community to reach herd immunity.”

Figure 17. The role of the vaccine in tackling the pandemic

“  
*Vaccine helps in building up immunity against the virus. It triggers your immune system to recognize and develop defensive responses against the pathogen. Thus, the rate of infection will be reduced.*

”

“  
*It plays a very important role to help a certain community to reach herd immunity. The vaccine is the key to reducing the infection rate of the virus, ameliorating the symptoms, reducing the number of deaths as well as the contagiousness of the virus.*

”

“  
*Vaccines are not going to make you immune. It just helps to reduce the severity of the virus, and the chance of death, which is incredibly comforting. As such even when vaccinated, social distancing and mask wearing should still be done.*

”

These qualitative answers suggest that a majority of the respondents have a **high level of comprehension and awareness about issues relating to COVID-19**. However, an **analysis of these responses indicate** that there remains **some inaccuracy around the fundamental scientific concepts related to COVID-19**, including the role of the vaccine.

# 3.0 Communicating Science for Climate Action Program

## Overarching Program Objectives:

For this program, we have invited science communication experts and enthusiasts to design various strategies to enable effective delivery of climate change and science information to selected target stakeholders/beneficiaries.

The project designs must harness scientific evidence, as well as data analysed and reported within the respective IPCC reports.

Additionally, this may also include other scientific literature reported by established researchers and organisations as supplementary sources. The program grantees must also share high quality Research & Innovation findings relevant to the themes they have chosen.

The IPCC was established to provide global policymakers with updated research and assessment regarding climate change to further inform on the mitigation and adaptation options in the future.

The IPCC reports are compiled by field experts and researchers to identify the current status of knowledge on climate change, and what gaps there may be in the research, on a global scale. The reports are neutral, policy-relevant, however, not policy-prescriptive.

1

To support climate science knowledge uptake and to enhance understanding of the science behind the drivers and impact of climate change among various stakeholders in Malaysia.

2

To encourage more people to take robust climate action at individual, community and national level.

3

To boost the science communication field by inculcating scientific literacy among the general public, enabling individuals the opportunity to interact with scientists and experts.

4

To increase scientific awareness and prompt an enabling system that will utilise scientific evidence to effectively drive social and economic progress.



# 3.0 Communicating Science for Climate Action Program - Overview

For this grant program, the **criteria** for the selection of grantees include, though not limited to:

- Groups of individuals comprising at least 5 members, either from youth-led organisations, university groups, NGOs/CSOs, and/or other relevant institutions,
- Open for those residing in the United Kingdom and Malaysia,
- Project leaders must have considerable experience in project management to be eligible for proposal submission.

## Preferred Project Outcomes



1. Understand the drivers of climate change, current trends and expected trends in global warming.



2. Develop the knowledge on potential ways to contribute in mitigating climate change.



3. Develop the knowledge capacity and awareness to adapt to the impact of climate change.



4. Understand the impact of climate change better in terms of climate change risk, ecosystem resilience, natural resource security, and the social and economic implications at personal or community levels.



5. Appreciate the stability of earth's life-support systems and human resilience to global changes; understand interdependencies, co-benefits & trade-offs across environment-human prospects and dimensions of sustainable development.



6. Aware of the multiple international initiatives in place to push and support global action for climate change including the IPCC, SDGs and UNFCCC.

# 3.0 Communicating Science for Climate Action Program - Overview

## Climate Change Themes

Through the initial public perception survey and range of interest assessment in climate change topics, four themes have been identified as the **main themes** under this program. These themes consist of **Ocean and Climate Change**, **Land and Climate Change**, **IPCC Reports on Global Warming (For Teachers/Educators)**, and **IPCC Reports on Global Warming (For Media Communities)**.

Under each theme, one team has been chosen as the grantee, apart from the Education theme, in which two grantees have been selected. They are as follows:

The following outlines the **overall outputs** compiled from all teams including the total number of participants, beneficiaries, stakeholders and experts engaged, as seen below:

Ocean and Climate Change	Kudat Turtle Conservation Society
Land and Climate Change	Time to Rice
IPCC Reports on Global Warming (For Teachers/Educators)	Universiti Malaya & University of Nottingham Malaysia
IPCC Reports on Global Warming (For Teachers/Educators)	DeRiA
IPCC Reports on Global Warming (For Media Communities)	Science Media Centre Malaysia



Throughout their program implementation period, each team has engaged with their respective target stakeholders as set out in their initial proposal. More details on each teams' engagements with their communities/beneficiaries is detailed in their respective reporting sections ahead.

As part of this program, each team was assigned several experts, some of whom work directly on IPCC reports, to engage with the teams and provide recommendations, input, and expert guidance to effectively guide their content creation, and validation of IPCC and scientific content. More details on each teams' engagements with the experts is detailed in their respective sections ahead.

# 3.1 Ocean and Climate Change



The Ocean and Climate Change topic covers ocean or coastal systems and its relevance with climate change. One of the main reasons for the severe effects of our ocean is the increase of carbon dioxide (CO<sub>2</sub>) and other greenhouse gas emissions (GHG) due to human activities. Degradation of marine and coastal ecosystems makes this an important issue to address.

In choosing this sector as one of the topics, the aim is to reach out to rural coastal communities in supporting climate change knowledge uptake. Coastal communities are heavily affected by climate change impacts which greatly endangers the economic, livelihood and food security of these communities.

The IPCC report used in reference to this theme is the 'IPCC Special Report: Ocean and Cryosphere in a Changing Climate'. This report addresses the importance of the ocean and cryosphere for people. Communities in close proximity to coastal areas such as small islands, polar regions, etc. are particularly vulnerable to ocean and cryosphere change, such as increase in sea levels and shrinking cryosphere<sup>6</sup>, further highlighting the importance of addressing this issue starting from a local scale.

## Team Background

### **Kudat Turtle Conservation Society (KTCS):**

Established in 2011, Kudat Turtle Conservation Society (KTCS) is a conservation centre based in Kudat, Sabah, Malaysia. Their primary aim is to conserve and improve Kudat sea turtle populations through public education and awareness programs.

They work hand-in-hand with partners in government and private sectors, civil societies and local communities in their effort to protect these endangered marine reptiles that are facing extinction globally.

## Project Background

### **Empowering Women of Kosuhui Village to Combat Climate Change:**

KTCS' project focuses on increasing awareness and knowledge among the coastal community of rural Kosuhui village in Sabah in regards to climate change. The project aims to do so by communicating scientific evidence related to sea level rise and warming of ocean temperature that impacted properties and fisheries.

The selected target audience is a group of local women in *Kumpulan Wanita Kg Kosuhui, Kudat*, also known as Kosuhui Women's Group, Kudat.

<sup>6</sup>IPCC, 2019. *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*. IPCC Reports. Intergovernmental Panel on Climate Change.

# 3.1 Ocean and Climate Change

## Empowering Women of Kosuhui Village to Combat Climate Change



### PROJECT OBJECTIVES

1. To increase community’s understanding and knowledge on climate change impact and adaptation at local context using scientific evidence.
2. To identify actions that can be carried out by the community that can contribute to combating climate change.
3. To provide platform for community members to talk and discuss about climate change with researchers.

### METHODOLOGY

The project was conducted in three phases, with participation from 10 Kosuhui women of the Women’s Group village. The Photovoice method is the primary science communication method used. It is a community-based and participatory research method that provides participants with a hands-on photography activity to document, reflect upon, and communicate issues of climate concern, with hopes to stimulate social and behavioural change<sup>7</sup>.

Phases	Description
<b>Phase 1:</b> A 2-day workshop introducing climate change and photovoice training	<ul style="list-style-type: none"> <li>• Project briefing to the Kosuhui women</li> <li>• Sharing sessions by Blue Communities Indonesia and Philippines researchers on how coastal communities from neighboring countries were impacted by climate change.</li> <li>• Identification of past environmental and climate events that impacted the village through Innovation History exercise</li> <li>• Introduction and training on Photovoice activity</li> </ul>
<b>Phase 2:</b> Photovoice and video production	<ul style="list-style-type: none"> <li>• Facilitation of the Photovoice activity</li> <li>• Production of a short interview-style video documenting the Kosuhui women’s personal experiences with climate change effects.</li> </ul>
<b>Phase 3:</b> <ul style="list-style-type: none"> <li>• Photovoice and video competition</li> <li>• Feedback from participants</li> </ul>	<ul style="list-style-type: none"> <li>• Program closure and feedback compilation</li> <li>• Assessment of the Kosuhui women’s knowledge on climate change through the Photovoice competition scoring criteria, followed by winner announcements.</li> </ul>

<sup>7</sup>Budig, K., Diez, J., Conde, P., Sastre, M., Hernán, M. and Franco, M., 2018. *Photovoice and empowerment: evaluating the transformative potential of a participatory action research project*. BMC Public Health, 18(1).

# 3.1 Ocean and Climate Change

## *Empowering Women of Kosuhui Village to Combat Climate Change*



### Results and Findings:

KTCS found that this project was the first environmental engagement program the Kosuhui women have joined. 80% of them have heard of or have some knowledge on climate change issues but not in a local context. The sharing sessions allowed an exchange in experience and personal-level information of how other coastal communities in different countries face climate change effects in their daily life.

The Kosuhui women were receptive to the Photovoice project as they gained the opportunity to voice out and share their stories through photographs taken for this project. The awareness of multiple international initiatives in place to push and support global action for climate change including the IPCC, SDGs and UNFCCC were mentioned, but these were considered as unfamiliar knowledge among the women.

#### Gaps in Project Implementation

Due to the baseline level of understanding on climate change among the participants, KTCS was only able to communicate the basics of the current and expected trends of climate change, particularly on global warming. A proposed solution is to prepare animated graphics to explain more technical aspects of climate change to increase engagement and ease of understanding.

#### Engagement with Experts

After several engagements with Professor Aileen Tan and Professor Melanie Austen, KTCS opted for the Kosuhui women to share their experiences with climate change effects through an interview-style video. In addition, they were able to prepare a more structured and straightforward discussion to ensure the women were fully engaged and able to comprehend the workshops flow and information received.

#### Science Communication Materials

KTCS produced the following science communication materials for this program:

1. E-photobook of Photovoice work of Participants from Empowering Women of Kosuhui Village to Combat Climate Change Project
2. Climate Change Witness Stories - Interview Videos



### Conclusion:

KTCS foresees that the women involved were potentially more conscious about their future actions and more willing to change their practices, and educate the younger generations via hands-on engagement. The Photovoice activity was particularly interesting for the participants as they were able to highlight the environmental issues they personally faced, and discussed these matters with other participants and scientists involved. KTCS believes that educating the women among the community is crucial, as women are one of the key local marine resource users, but are yet to be given priority in local marine resources management.



## 3.2 Land and Climate Change



The topic of Land and Climate Change addresses climate change in the context of land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems<sup>8</sup>. About 23% of global human-caused greenhouse gas emissions come from agriculture, forestry and other land uses. Land use change, such as clearing forests to make way for farms, drives these emissions. In choosing this topic, the target community are those in the agricultural community, whose livelihoods are directly affected by climate change.

The IPCC Report reference chosen for this topic is the IPCC Report: Climate Change and Land. This IPCC report covers existing science to date on how greenhouse gases are released and absorbed by land-based ecosystems, and the science on land use and sustainable land management in relation to climate change adaptation and mitigation, desertification, land degradation and food security.

### Team Background

#### Time to Rice:

Time to RICE is a multidisciplinary group of 5 young professionals united by their love of nasi lemak and the planet.

The team's backgrounds range from biochemistry-trained food security policy advocator, designers trained in architecture with knowledge of urban systems and sustainable development, educators in higher-education institutes, to a freelance journalist with a science background.

### Project Background

#### Co-creating & Gamifying Climate Science Communication Workshop:

Time to RICE aims to tackle land-related climate change challenges through the method of gamification, an approach that encourages young people to easily connect with and engage.

Food is a topic that is highly relatable in many societies, especially in Malaysia where food is core to the culture and identity -- an ode to their name, Time to RICE.

By translating the complex food supply chain process and mechanisms, and climate science into a more comprehensible language through gamification, it will enable young people to internalise scientific knowledge of the climate emergency.

<sup>8</sup>IPCC, 2019. *Special Report on Climate Change and Land*. IPCC Reports. Intergovernmental Panel on Climate Change.

# 3.1 Land and Climate Change

## Co-creating & Gamifying Climate Science Communication Workshop



### PROJECT OBJECTIVES

1. To instill a deeper understanding and appreciation of the 1.5°C mitigation pathways in climate science knowledge through an immersive co-creation exercise with gamification principles
2. To cultivate the general public's, especially youth's and educators', proclivity to engage and make personal changes in combating the climate crisis by contextualizing climate science knowledge and the cascading impacts of our decisions.
3. To co-develop tangible, modular, scalable and transferable communication material that can be used by educators.

## METHODOLOGY

Time to RICE used rice as a starting point to initiate discourse on climate change related events and actions in relation to food security, inviting participants on a mission to save Nasi Lemak. The game is broken down into 7 chapters (The Extinction of Nasi Lemak, The Time Travel, Know Our Rice, Gotong Royong, Time To Rice, To Rise or To Rice?, Sembang-semang). Gamified co-creation workshop flow:

Phases	Description
<p><b>Phase 1:</b> Develop an innovative toolbox to enable science communication materials among transdisciplinary educators</p>	<ul style="list-style-type: none"> <li>• Interactive, 3 hours workshop programme with story, quiz, and co-creation of game Canvas</li> <li>• Game simulation section, with feedback section.</li> </ul>
<p><b>Phase 2:</b> Establish stakeholders and focus groups to identify existing gaps and resistances in climate change science communication</p>	<ul style="list-style-type: none"> <li>• Time to RICE delivered the aforementioned workshop programme 5 times, with stakeholders and participants from NGOs, youth groups, educators and agricultural communities.</li> <li>• Collection of direct inputs from users' feedback as well as indirect inputs through observations by facilitators to further evaluate the gaps and resistances</li> </ul>
<p><b>Phase 3:</b> Produce social media and marketing materials for info dissemination</p>	<ul style="list-style-type: none"> <li>• Infographics creation based on group members' extensive research on climate change and food systems, and also via conversation with IPCC experts.</li> </ul>

# 3.1 Land and Climate Change

## Co-creating & Gamifying Climate Science Communication Workshop



### Results and Findings:

Participants were actively engaged in the co-creation and gamification workshop, as they provided live feedback and opinions on ways this workshop could be improved into a more refined educational tool. Several participants have shown interest in the development of the workshop. It was evident that all participants have deepened their interest and understanding towards climate change as well as the food system upon completion of the workshop. Overall, the participants were inspired to engage in similar gamification virtual workshops such as this due to the innovative, collaborative and engaging nature of it.

#### Gaps in Project Implementation

At times, the knowledge gap among participants was notable. Participants with zero to little background knowledge found themselves unable to contribute “scientifically” and some were unfamiliar with the topic of food supply chain. Some of the participants struggled to play the role of the lesser-known-players.

Moreover, some participants were too critical and realistic which sometimes led the game to a pessimistic atmosphere.

#### Engagement with Experts

Prof. Tim highlighted the need for systemic design thinking and suggested looking at the problems from a macro perspective. Dr Sofie and Dr Stephanie provided more detailed facts and accounts across South East Asia and other wider tropical regions. Meanwhile, Dr Aazani helped to contextualise the realities of the local Malaysian food systems and the gamification elements.

#### Science Communication Materials

Time to RICE produced the following science communication materials for this program:

1. Co-creation and Gamification Workshop Template & Manual
2. Infographics & interactive posts about food system and climate change on different social media platforms
3. Workshop Documentation Report



### Conclusion:

The gamification of the supply chain is an excellent tool in education and awareness enhancement through learning-by-playing, further providing a tangible way for youth and young adults to learn about environment- and climate-related topics. This workshop enabled the participants to understand the food supply chain as well as how their decisions in food-related occupations and personal food purchases can affect the climate emergency.

# 3.3 IPCC Reports on Global Warming (For Media Communities)

The media and climate change theme covers the role of the media in highlighting the impacts of 1.5°C global warming on natural and human systems with support from stakeholders and policymakers to address climate change. The target audience for this sector is the media community as the potential of journalists being involved in climate action still remains largely untapped. The report further details the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty<sup>9</sup>.

## Team Background

### Science Media Centre Malaysia:

The team consists of experienced media professionals, science journalists and communicators, as well as climate change researchers and experts. SMC is an online and independent resource centre with an aim to provide evidence-based information to support local journalists to report on complex or controversial science issues that make the headlines.

## Project Background

### PANAS! Climate Change Stories in Malaysia:

In Malaysia, the main stories and news covered are often the intersection of climate change and natural disasters. The lack of understanding on climate science and its technicalities attributes to the inability of journalists to link climate impacts to the public, as well as relating climate change coverage to high level climate policies such as reports by UNFCCC, including the IPCC. As a result, these topics are reported only at the surface level which lacks in-depth analysis and reflection. To tackle this, SMC focuses on the development of a digital toolkit which serves as a guide and resources for journalists, writers, and content creators covering climate change topics by referencing the IPCC report.

<sup>9</sup>IPCC, 2018. *Global Warming of 1.5 °C*. IPCC Reports. Intergovernmental Panel on Climate Change.

# 3.3 IPCC Reports on Global Warming (For Media Communities)

*PANAS! Climate Change Stories in Malaysia*

## PROJECT OBJECTIVES

1.

Commission local journalists and content creators to produce human-centred stories responding to the IPCC fact sheet

2.

Train and mentor journalists with necessary skills to report on the IPCC through capacity building workshops and mentorship programme

3.

Develop and produce a digital toolkit on climate change for local media outlets and journalists, addressing climate change issues and misconceptions and local climate action initiatives in Malaysia

## METHODOLOGY

Phases	Description
<b>Phase 1:</b> Shortlisted 10 submissions from journalists and content creators from across all media platforms and languages to produce content-based fact sheet from IPCC	<ul style="list-style-type: none"><li>• A call for submission for applicants to submit a 200-word pitch on a story angle of their choice.</li><li>• Nine successful grantees were selected and received RM500 each to produce a 500-700 word story regarding climate change</li></ul>
<b>Phase 2:</b> Conducted workshop on IPCC media coverage	<ul style="list-style-type: none"><li>• To upskill and educate the grantees on climate change topics, SMC organised a media workshop, provided mentorship and produced an online toolkit to assist them with their stories.</li></ul>
<b>Phase 3:</b> Produced and disseminated a climate change digital toolkit for the media	<ul style="list-style-type: none"><li>• To assist SMC in producing the toolkit, they set up a board of subject experts consisting of experienced journalists, media professionals and science communicators for feedback and input sharing.</li></ul>



# 3.3 IPCC Reports on Global Warming (For Media Communities)

*PANAS! Climate Change Stories in Malaysia*



## Results and Findings:

The “PANAS!” media toolkit was well received by the media community as it works as a primer for journalists, not just as a helpful starter for those unfamiliar with climate reporting. It enabled deeper dives as they were able to be connected with field experts. The media community including the general public were pleased to find the toolkit in Bahasa Malaysia version as generally resources on climate change are often limited to English.

### Gaps in Project Implementation

There was a lack of information and resources available in other languages besides English especially on environment and climate change topics in a Malaysian context. Hence, such content is needed more in Bahasa Malaysia, Mandarin, Tamil and native languages to create public awareness through the media. A high quality and impactful climate change story would ideally require participants to investigate the story by deep diving into the topic and conducting fieldwork, facilitate interviews, draft and re-edit, pre & post production which all takes time.

### Engagement with Experts

The team connected with Professor Fredolin Tangang and Dr Sally Brown to receive input and recommendations on the development of their digital toolkit.

### Science Communication Materials

SMC produced the following science communication materials for this program:

1. PANAS!  
Communicating  
Climate Change for  
Media Digital  
Toolkit



## Conclusion:

In the face of climate change, journalists and content creators increasingly play a major role in helping accelerate climate action through advocacy and education. Through this PANAS! project, the beneficiaries/participants are empowered through the workshops and the platform is provided for them to write about the topic of climate change which normally would not get much attention from editors/media outlets.

# 3.4.1 IPCC Reports on Global Warming (For Teachers/Educators)



The topic of IPCC Reports on Global Warming (For Teachers/Educators) covers climate information that is specifically intended for teachers. It is presented together with a selection of related activities and exercises that can be implemented in the classroom, and was produced by the Office for Climate Education. The IPCC Report reference chosen for this topic is the IPCC Report: Global Warming of 1.5°C. The report addresses the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty<sup>10</sup>.

## Team Background

### DeRiA:

DeRiA is a diverse group of young individuals from Southeast Asia (Malaysia, Singapore and Indonesia) that are united under a shared vision of fighting against climate change and global warming. Most of the members were Young Southeast Asian Leaders Initiative (YSEALI) Academic Fellows, a U.S. government's signature program launched by the U.S. President Barack Obama.

## Project Background

### DeRiA Environmental Education Playbook using Multisensory Learning Approach:

DeRiA firmly believes that in order to mitigate these effects, it is imperative to bring sophisticated environmental science-based research findings to the public.

While Environmental Education (EE) resources amongst students in Malaysia is available, it is limited. Therefore, DeRiA intends to utilise science communication techniques through basic EE awareness-based teaching activities in Malaysian schools to boost the interest and commitments of young people, especially school students in Malaysia towards becoming responsible green advocates and citizens.

<sup>10</sup>IPCC, 2018. *Global Warming of 1.5 °C*. IPCC Reports. Intergovernmental Panel on Climate Change.

# 3.4.1 IPCC Reports on Global Warming (For Teachers/Educators)



DeRIA

*DeRIA Environmental Education Playbook using Multisensory Learning Approach*

## PROJECT OBJECTIVES

1.

To promote multi-sensory activity and gamification methodology using Environmental Education Playbook (EEP)

2.

To gain more experience on Environmental Education (EE) among students

3.

To develop the green values and mindset act among students

## METHODOLOGY

Phases	Description
<b>Phase 1:</b> Discover	<ul style="list-style-type: none"><li>• Reading on various papers and articles on the multisensory approach for Environmental Education and implementation of this methodology during the training.</li><li>• Focus group discussions for generating lesson plan ideas with local teachers.</li></ul>
<b>Phase 2:</b> Diagnose & Design	<ul style="list-style-type: none"><li>• Inclusion of the physical and virtual lesson plan icon in the design of the Playbook.</li><li>• Inclusion of a “Family Friendly” icon in a few lesson plans, which can be conducted with family members at home due to the pandemic.</li></ul>
<b>Phase 3:</b> Launch & Implement	<ul style="list-style-type: none"><li>• Virtual launch of the Playbook for teachers, official partners and experts via Zoom, broadcasted live on Facebook.</li><li>• Introduction of the DeRIA Digital Library and a short crash course on how to use the Playbook in the classroom to the audience during the launch.</li></ul>

# 3.4.1 IPCC Reports on Global Warming (For Teachers/Educators)



DeRiA

*DeRiA Environmental Education Playbook using Multisensory Learning Approach*



## Results and Findings:

Based on the methodology conducted by DeRiA, most of the teachers/participants found the guest speakers during the virtual focus group discussions very engaging and motivating. Moreover, 40% of the teachers have already conducted the lesson plans based on the Playbook. Furthermore, the teachers were given the opportunity to network with other teachers from other countries and learn new teaching methodologies from one another. Overall, the teachers found the Playbook design to be engaging and simple to use with its ‘pick, adapt and execute’ approach.

### Gaps in Project Implementation

Some of the teachers found that the 2 hours ideation session was insufficient time to dive in depth into the assigned focus group discussion topics.

Moreover, due to various lockdowns and COVID-19 hotspots, some teachers faced difficulty in conducting their lesson plans.

### Engagement with Experts

Based on DeRiA’s interactions with Dr Alistair Hunt, Dr Choong Weng Wai and Dr Piers Forster, the team were given different perspectives to consider and were guided to elevate and refine the program.

The experts have also introduced the DeRiA team to their networks, enabling them to leverage these connections to improve the project even further.

### Science Communication Materials

DeRiA produced the following science communication materials for this program:

1. DeRiA Environmental Education Playbook using Multisensory Learning Approach



## Conclusion:

All teachers involved in the program have been highly receptive to the Playbook, and have expressed their willingness to recommend and share the Playbook within their social circles and networks. The impact of the Playbook has been highly regarded among the community, and thus highlights the importance of such an effective environmental resource.

## 3.4.2 IPCC Reports on Global Warming (For Teachers/Educators)



### Team Background

#### Universiti Malaya & University of Nottingham Malaysia (UM & UNM):

The team is a multidisciplinary group of five university educators with a passion for the environment and education, from world top-ranked universities, Universiti Malaya and University of Nottingham Malaysia, with experience in running international and national projects on haze, climate change, water security, as well as online learning.

Their combined expertise and experience in Climate Change and Online Teaching, alongside their respective universities' resources (eg. library, labs, reputation, networks) were utilized to create and conduct impactful climate change modules for university students and others.

### Project Background

#### Bite-Size Climate Action: Online Modules for Malaysian Youth

Currently, some confusion still remains regarding basic scientific climate concepts. Governmental and institutional responses to climate change are insufficient to secure lasting effects without the community's support. There is an urgent need for improved knowledge and awareness, and an even more urgent need to communicate climate science in a way that results in meaningful and impactful climate action.

Following the IPCC Reports on Global Warming and the implicit call to educate the youth about their role in mitigating climate change, the team from UM and UNM proposed to develop an online course consisting of a series of short online modules to communicate the science behind climate action and promote simple, "bite-sized", climate-friendly actions as a daily habit or lifestyle. The target audience chosen for this project were university students aged 18-25 years old.





# 3.4.2 IPCC Reports on Global Warming (For Teachers/Educators)

*Bite-Size Climate Action: Online Modules for Malaysian Youth*

## PROJECT OBJECTIVES

1. To develop impactful online modules for climate change by utilizing outcome-based microlearning principles and interactive online learning design.
2. To empower university students to be climate literate change-agents for climate change by modelling climate action behaviours for their friends and family.
3. To communicate the science of climate change and promote climate action by networking with Malaysian university lecturers and youth-led climate movements to integrate climate action modules into their respective programmes/ workshops/ courses.

## METHODOLOGY

Phases	Description
<p><b>Phase 1:</b></p> <p>Design of curriculum module and development of course materials</p>	<ul style="list-style-type: none"> <li>• Internal meetings to decide on the module curriculum design and technique as well as approaches used to develop the course materials.</li> <li>• A Focus Group Discussion with university students to find out what they liked and did not like in a project such as this.</li> <li>• Modules are designed based on the following key principles: (1) Practical application, (2) Authentic content, (3) Small, bite-sized lessons, (4) Social learning, and (5) Youth engagement through social media.</li> </ul>
<p><b>Phase 2:</b></p> <p>Test run with students</p>	<ul style="list-style-type: none"> <li>• Conducted a User Experience Exercise with 49 university students from around Malaysia from 19th to 22nd April 2021.</li> <li>• The broader scope of the survey allowed a wider range of responses, including students who are not necessarily 'environmentalists'. The team encouraged respondents to create a reflection video about the project and post it on social media.</li> </ul>
<p><b>Phase 3:</b></p> <p>Official module launch and continuation of promotion</p>	<ul style="list-style-type: none"> <li>• Official launch of the modules on 30th April 2021</li> <li>• Promotional activities after the launch</li> </ul>

# 3.4.2 IPCC Reports on Global Warming (For Teachers/Educators)

## *Bite-Size Climate Action: Online Modules for Malaysian Youth*

### Results and Findings:

#### Video

The video component was voted as the most 'helpful' in the User Experience Exercise.

#### Quizzes

Many comments indicated they liked the quizzes but wished they had more questions. The team then increased the number of questions to 8.

#### Infographics

The infographics were identified as the second most helpful. Overall, the detailed feedback said that the infographics were easy to understand.

#### Podcasts

Those who enjoyed the podcasts the most said that this podcast format was a very different format from what they were used to, which was refreshing.

#### Tik Toks

The feedback on the Tik Toks was largely positive, with many saying that it was unique, fun, and well-produced.

#### Reading List and Resources

Feedback on these items was also positive, with these links leading them to very useful additional information.

### Gaps in Project Implementation

The team could have benefited from running a User Experience Exercise with a larger, more representative group of Malaysian students. This would diversify and strengthen the feedback received regarding the modules.

### Engagement with Experts

The team has connected with Dr Choong Weng Wai, Dr Chris Smith and Prof Dr Piers Forster. Most of the discussion involved thinking about ensuring that the knowledge the team shared through the modules would ensure an actual change of behaviour and action.

### Science Communication Materials

The team from UM & UNM Malaysia produced the following science communication materials for this program:

1. Bite-Size Climate Action: Online Modules for Malaysian Youth

### Conclusion:

The modules allowed participants to immediately obtain a greater understanding of climate change in general and how their personal actions can contribute to climate change in the six identified module topic areas. They gained ideas about simple-to-do climate actions, inspired by mitigation pathways compatible with the 1.5°C global warming limit, to learn, practice, and build into a habit.

# 4.0 The Science Communication Process

## 4.1 Science Communication Process - From Experts to Science Communicators

As part of this program, experts from various fields—some of which are scientists who have worked or are working directly on the IPCC reports—engaged with the different teams by providing recommendations, guidance and inputs on science communication. Survey assessments were given out to both the experts as well as the teams to gauge engagement effectiveness and gather further insights on scientific topics and effective science communication techniques.

### 4.1.1 Survey assessment by science experts

The survey assessment provided to the experts revealed that engagement with the teams was generally very effective, with some minor challenges. When asked about the satisfaction level for the coordination of the team meetings, most experts scored 10, indicating a high level of satisfaction. Many of the experts felt that their professional experience and guidance were effective and had a lasting impact on the team's project direction and implementation.

The experts stated that it was a highly smooth process when it came to communicating scientific terms and concepts to the team. The teams were able to express insightful comments and challenges faced throughout the program. Although there were no barriers in communication from any academic background, cultural or location differences, some of the experts had pointed out that more meetings (perhaps three or more) would have been beneficial to properly observe and monitor further development of the projects.

When probed about the skills and preparedness level of scientists in generally communicating their study to the general public, there were mixed responses from the experts. On the one hand, some indicated that scientists generally make up a well-organized team who are informed about the subject matter. Conversely, other experts stated that many scientists are not properly trained to deliver and communicate scientific knowledge in an appropriate manner and considers the different academic background levels of the general public to be a factor.

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A strong climate message needs the same understanding of key words between all partners; in language and context that is understood by all.”

Oftentimes, the language used to express the information is too technical, further causing a disconnect between the scientific community and the public. On average, the experts rated public understanding with a score of 6 out of 10, suggesting that the general public do not have a comprehensive grasp on climate change. What is needed is for scientists to be prepped with sufficient material and training to deliver these information in simpler terms.

## 4.1.2 Survey assessment by program grantees (teams)

From the survey assessment, most team members scored 9 out of 10 on the level of productivity and effectiveness of the meeting sessions, indicating highly beneficial sessions. The experts were good at providing guidance and explaining specific terms and concepts in an understandable manner, which helped to consolidate the members' understanding for project development. The feedback and recommendations obtained enabled the teams to make thoughtful changes to their project—evident from the positive outcomes.

A majority of the teams agreed they were able to acquire interesting and instructive information on climate change science that they were unaware of prior to the meeting sessions. Some of the teams' key learning takeaways from the experts engagement include a better understanding of different industry insights and models, as well as application of various science communication approaches and techniques such as measuring behavioural change to strengthen their project's development.

Aligned with the responses given by the experts, the team members agreed that public understanding on climate change is still relatively low and could be improved. This is exacerbated by the fact that science and research work presented by scientists are often difficult to understand and grasp by the general public, especially for those without scientific background. Most members suggested that one way to potentially address this issue is to have more direct interactions with scientists to explain scientific concepts on a basic level.

## 4.2 Science Communication Process Overview

This section details the overall science communication process of the projects as surveyed by the program beneficiaries/participants. From the survey, most indicated that the delivered program they have attended by the respective team was productive and effective, while others described the process as being clear, straightforward, interesting and engaging.

The applicants indicated that the effective communication tools and delivery were those that did not bombard them with facts and scientific information. Instead, the projects that incorporated learning with fun, engaging and interactive approaches such as games, quizzes, role plays, open discussions, podcasts and Q&A sessions were most captivating.

Programs that encourage active participation by the participants, such as co-creating games and simulating role-plays not only offered good insight into the complexities involved in climate change, but also enabled participants to 'enter' the role of key stakeholders to better understand how and why certain real-life decisions are made in regards to climate action.

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As Carl Sagan predicted in his 'The Demon-Haunted World', **when society functions on a technological foundation understood only by few, it's a recipe not for revolution, but regression.**

Challenges such as the current pandemic and climate change will not slow down to wait for social debate and acceptance.

”

## 4.2 Science Communication Process Overview

This section details the overall science communication process of the projects as surveyed by the program beneficiaries/participants.

The ongoing Q&A sessions were helpful for active discussion as the team members would regularly check with the participants on their understanding of the topics, which led to better clarity for both parties.

Only several participants expressed that certain topics in the projects were too in-depth and required prior background knowledge on, which rendered understanding a challenge. A few participants felt that some activities were too independent, making it difficult to navigate through technical tasks on their own.

Hence, to improve the communication methods, participants suggested presenting scientific data and facts with simpler language/terms, having more guided group sessions, and including a section dedicated to community action (what participants can do to help contribute towards this issue).

Overall, the participants were highly satisfied with the coordination of the projects by the teams, scoring, on average, a 9 out of 10. In fact, several participants attended more than three sessions organised by certain project teams, indicating that some teams were able to effectively continue their engagement with the participants.

Moreover, through their projects, the teams were able to impart key learnings and relevant knowledge onto the participants, specifically relating to greater insights on climate change threats and the urgent need for everyone to do their part in helping to minimize climate change.

Without clear communication, the general public would not be able to properly understand scientific issues at hand and hence, miss out or lose engagement and interest. Only by effectively delivering a desired message to the intended recipient can a movement be able to mobilize.

With the right techniques and more targeted approaches, the message can be delivered more effectively to others. Delivering it is one thing but to ensure it serves its purpose is another. People need to feel something in order to relate.



## 5.0 Key Takeaways

### 5.1 The importance of science communication for climate action in Malaysia, and long-term impacts of climate education for local communities and the general public

Through this program, it is clear that effective science communication techniques are needed to champion robust climate action in Malaysia, at a local context. Misinformation runs rampant across digital platforms, and thus reinforces the need for reliable, evidence-based sources for climate and science information. Such information, especially with a largely technical nature such as the data reported in the IPCC reports, is not as easily digestible for the general public.

Communities such as rural, coastal, and agricultural communities, etc. are heavily impacted by climate change, and thus require support from those who are better versed in climate related science knowledge. One of the main roles of a science communicator is to ease communication and bridge any gaps between the scientific community and the general public.



The valuable insight into the concepts and information of climate change, science communication in Malaysia can further mobilise the general public to comprehend this information, then potentially contribute to the mitigation and adaptation of climate change, even from a small scale.

Environmental education (EE) on climate change is potent to ensure high public awareness and better preparedness for climate discourse. Upon receiving education on science communication for a long term, it would be easier for the public to understand how international initiatives, such as the IPCC, SDGs, and UNFCCC are assisting against climate change on a global scale. Understanding climate change issues on a deeper level with the information provided by these initiatives will help empower the people to tackle and adapt to the climate situation and make better environmental decisions for a more sustainable future.

## 5.0 Key Takeaways

### 5.2 The significance of local communities' empowerment in climate action

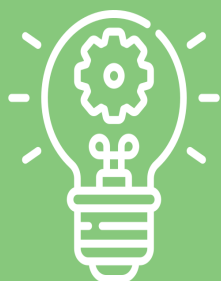
Local Malaysian communities, especially those in more rural areas, are more susceptible to the effects of climate change as these communities are considered some of the main primary users of natural resources of the country. Empowering local communities around Malaysia encourages them to use their own knowledge to make decisions on actions against climate change.

From this program, efforts by KTCS to empower women from rural Sabahan communities to champion climate change must be highlighted. The women play a bigger role in educating the younger generation as they are the ones who utilise the local marine resource users first-hand, but have not been given an opportunity to contribute to local marine resource management.

As the saying goes, youths are the backbone of a nation, empowering them to be climate literate change-agents. Youths were predominantly given high priority in this program as well as they are expected to develop personal actions and spark movements that can contribute to global efforts in the future.

The Communicating Science for Climate Action program, over the course of its implementation period, has brought to light some of the most effective science communication tools that could create impactful communication including the sharing and educational sessions such as:

1. KTCS' Photovoice activity and interview-style video production
2. DeRiA's Environmental Education Playbook using Multisensory Learning Approach
3. Time to RICE's Co-creating & Gamifying Climate Science Communication Workshop
4. SMC's PANAS! Communicating Climate Change for Media Digital Toolkit
5. Universiti Malaya & University of Nottingham Malaysia team's Bite-Size Climate Action: Online Modules for Malaysian Youth



## 5.3 Effectiveness of the Communicating Science for Climate Action program in delivering scientific information and climate science to targeted audiences

The rural communities from the coastal areas found the CSFCA program by KTCS to be insightful as they learned how coastal communities were impacted by climate change. It has been an eye-opener experience as they were exposed to an environmental engagement program for the first time. They gained opportunities to enhance their knowledge capacity and environmental awareness on climate change, particularly through the Photovoice technique and interview-style video production.



1.

2.



To deliver environmental science based research to primary level students, an EE playbook was produced to instill environmental values in children, starting the education from young. The simple "pick, adapt and execute" method by DeRiA enabled teachers to conduct lessons better and made it easier to form a network of communication among teachers around Malaysia to learn and form new teaching methodologies.

The gamification and co-creation tool used by Time to RICE targeting the youth age group helped instill deeper understanding on climate science knowledge and gave youths a fun way to engage and combat climate crisis during the gamification-style workshop.



3.

4.



The media toolkit, PANAS! developed and produced by SMC was well received by the media community as it was easily accessible. The bilingual versions of Bahasa Malaysia and English enabled readers to better understand the issue of climate change, myths and misconceptions to be written as a story in the media. This has definitely been an effective move to bring about a change within the media industry, and to involve more journalists in reporting about climate in more depth.

The Bite-Size Climate Action modules, developed by the experts from UM and UNM, with a selection of interesting climate activities and exercises for educators and teachers have created a positive response from their students. Various materials were created such as videos, infographics, quizzes and more. The module will remain to be used by the universities and the public to encourage active and positive behavioural actions against climate change, at individual levels.



5.

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