

**Science Diplomacy Workshop 2023**  
**In Conjunction with the ICGEB Training Course on the Molecular**  
**Microbiology and Microbiomes of Agricultural and Industrial Waste**  
**Utilizations**

**Program Report**

**Prepared by:**

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## **Program Summary**

This ICGEB-funded course focusing on the molecular microbiology and microbiomes of agricultural and industrial waste utilization was successfully completed on 14-17 August 2023. The aims were to equip the participants with the skills and knowledge to spearhead research in advanced waste utilizations, particularly on the microbiome aspects. The course brought together experts, researchers, postgraduate students, and enthusiasts from diverse fields to explore the powerful role of microbiology in transforming agricultural and industrial wastes into valuable resources.

The course content was designed to provide participants with a comprehensive understanding of both theoretical and practical aspects of molecular microbiology and microbiomes in agricultural, industrial, and related contexts. The first two days were filled with engaging talks from renowned experts and leaders in their fields, sharing their insights and experiences. The topics covered include microbial ecology, cutting-edge metagenomic techniques and applications, enzyme discovery and engineering, bioremediation and biodegradation of pollutants, and sustainable palm oil production. The public talk sessions on day 1 and 2 were also live streamed on the Faculty of Science Facebook page (<https://www.facebook.com/FakultiSainsUTM>), which can perpetually be viewed from all over the world. Day 3 and 4 were focused on practical sessions on total DNA extraction from industrial samples and a demonstration of computational biology tools for DNA sequence data analysis and visualizations.

With the support from INGSA-Asia, a special roundtable discussion on science diplomacy was included to introduce the participants to the concepts of science diplomacy and the case studies in their countries. Several facilitators from the Young Scientists Network-Academy of Sciences Malaysia (YSN-ASM) were specially invited to moderate this session. The session started with the introduction on science diplomacy concepts by Dr. Mohd Firdaus, before a small group discussion was held. The facilitators and participants finally drafted up a case study that can be used in future science diplomacy related training. Participants were specially selected and invited from the ICGEB member countries such as Bangladesh, Djibouti (non-member), Morocco, India, Nigeria, and Malaysia, from among the senior professors, mid-career, postdoctoral fellows, and postgraduate students.

In conclusion, the participants expressed enthusiasm about applying their newly acquired knowledge on science diplomacy, many of whom have never heard of it before. A new network for future collaborative endeavors was also created, becoming the platform to share science-related news among the participants.

Supporting documents are attached with this report.

1. Facilitators list.
2. Case study drafted.
3. Event photos.
4. Financial report.

1. Dr. Mohd Firdaus Abdul Wahab (UTM, Johor Bahru, Johor)
2. Prof. Ir. Dr. Denny Kok Sum Ng (Sunway University, Bandar Sunway, Selangor)
3. Dr. Siti Hawa Ngalim (Universiti Sains Malaysia, Penang)
4. Assoc. Prof. Ts. Dr. Aslina Baharum (Sunway University Bandar Sunway, Selangor)
5. Ts. Insp. Mohd Norzikri Kamaruddin (Royal Malaysian Police, Kuala Lumpur)

## **APPENDIX 2 - CASE STUDY**

### Participants Profile:

Shah Islam (Bangladesh) - Expertise in saline-tolerant bacteria/microbes.

Vijay Kannusamy (India) - Expertise in microalgae with robust strain for use in bioenergy, biodiesel and nutraceuticals.

Abd Rahman Jabir (Malaysia) - Expertise in detox applications of environmental microbes.

Peer Mohamed (Malaysia) (event speaker) - Fermentation of palm oil waste for sustainability and community benefits.

Hasna Nait (Morocco) - Expertise in isolating environmental strain, overseeing valorization between Morocco and France.

Abdirahman Fourreh (Djibouti) - Expertise in medicinal plants and fermentation.

### **Reflection on Diplomatic Issues in Participants' Own Countries/Continents**

Shah & Vijay: Water overflow and drought issues between India and Bangladesh.

Jabir: Palm oil misconception and deforestation issue in Southeast Asia.

Peer: Transboundary fisheries issues involving Vietnam and Malaysia.

Hasna: Geo-boundary disputes, natural resources conflicts, and third-party involvement in Morocco and Algeria.

Abdirahman: Challenges between Ethiopia and Djibouti as Djibouti imposes high 'toll' fees on Ethiopia to access to food supplies via Djibouti sea ports.

### **Roundtable Negotiation on Selected Diplomatic Issues**

Participants are divided (voluntarily) into two groups of nations in conflict.

Participants were asked to wear different hats, as politicians and as scientists.

## **Case Study 1: Water Issue Between Country A/India and Country B/Bangladesh**

#### Discussion Highlights:

Country A: Identified issues related to water irrigation system planning and behavioural challenges among its citizens.

Country B: Raised concerns about perceived mistreatment by Country A.

#### Potential solutions:

Country A: Proposed mutual understanding, proper rainwater management, joint investment in sustainable water management and behavioural change programs.

Country B: Suggested the formation of a river commission, creating water reservoirs, investing in seawater desalination, and exploring funding options (eg. 50%-50% allocation from both countries; else, ask help from international funding agencies)

#### Facilitators' Comments:

Some facilitators noted challenges in reaching an agreement, especially regarding financial contributions from both nations.

### **Case Study 2: Geopolitical Issue Between Country C/Algeria and Country D/Morocco**

#### Discussion Highlights:

Country C: Highlighted the role of minority support in Country D and their financial backing from a third party (Country F). Mentioned the halt in natural gas export to Country D.

Country D: Discussed their natural gas supply from Country E, their educational support in return, and the phosphate trade dispute.

#### Potential Solutions:

Country C: Proposed an equal exchange agreement, a peaceful referendum with UN and African Union involvement, and exploring alternative phosphate conversion methods.

Country D: Advocated for collaboration in research, technology and invention, resolving conflicts of interest, public enlightenment, and adopting biogenic process for raw biomass (good for SDG 2 - zero hunger, SDG 7- affordable and clean energy, SDG 11 - sustainable cities and communities)

#### Condition for Agreement:

Country D expressed willingness to cooperate if Country C refrained from involving a third party (eg: Country F) in the resolution process.



**Figure 1. Workshop participants during roundtable session.**



**Figure 2. Workshop participants during group discussion.**



**Figure 3. Workshop participants exchanging views during group discussion.**



**Figure 4. Dr Firdaus, Grassroots 2022 recipient engaging with participants during roundtable discussion.**

#### APPENDIX 4 - FINANCIAL REPORT

FINANCIAL REPORT		
INGSA-Asia Grassroots Science Advice Promotion Awards 2022 (Activity 2)		
<b>ITEMS</b>		
<b>GRANT AMOUNT (RM)</b>		<b>5090</b>
<b>ACCOMMODATION</b>	<b>Cost (RM)</b>	
Assoc. Prof. Ts. Dr. Aslina Baharum	220	
Dr. Siti Hawa Ngalim	211.46	
Insp. Ts. Mohd Norzikri Kamaruddin	220	
<b>TRAVEL</b>		
<b>Flight</b>		
Assoc. Prof. Ts. Dr. Aslina Baharum	67	
Dr. Siti Hawa Ngalim	291.01	
Insp. Ts. Mohd Norzikri Kamaruddin	258	
<b>Taxi/E-hailing</b>		
Dr. Siti Hawa Ngalim	179.1	
Insp. Ts. Mohd Norzikri Kamaruddin	39	
<b>Mileage</b>		
Assoc. Prof. Ts. Dr. Aslina Baharum		
82 km x 82 km, RM0.70 per km for first 500 km, RM0.65 for 501-1000 km (Kelas A)	114.8	
<b>Miscellaneous</b>		
Assoc. Prof. Ts. Dr. Aslina Baharum (Parking Fee)	92	
<b>MEAL REIMBURSEMENTS</b>		
Assoc. Prof. Ts. Dr. Aslina Baharum	120	

Dr. Siti Hawa Ngalim	120	
Insp. Ts. Mohd Norzikri Kamaruddin	120	
Prof. Ir. Denny KS Ng	120	
<b>TOTAL REIMBURSEMENTS</b>		
Assoc. Prof. Ts. Dr. Aslina Baharum	393.8	
Dr. Siti Hawa Ngalim	590.11	
Insp. Ts. Mohd Norzikri Kamaruddin	517	
Prof. Ir. Denny KS Ng	120	
<b>TOTAL SPENDING</b>	<b>3793.28</b>	
<b>SURPLUS</b>		<b>1296.72</b>