

REPORT ON IAP/SEP PROGRAMMES / ACTIVITIES 2018

1.0 PROGRAMS FUNDED UNDER IAP SEP

1.1 IAP SEP Global Council Meeting 2018, 10 April 2018 Islamabad, Pakistan

The above meeting was held on 10 April 2018 and was hosted by the ECO Science Foundation (ECOSF) and the Pakistan Academy of Sciences at Islamabad, Pakistan and was attended by 9 members of the IAP SEP Global Council. IAP SEP GC Chair, Dato' (Ir) Lee Yee Cheong Matters discussed included the following:

1. IAP SEP Report on Funding for 2017 activities
2. IAP SEP Summary of One Belt One Road Fusion of Civilisations Curriculum Workshop in Kuala Lumpur
3. Report from Regional Coordinators (NASAC, AASSA)
4. IAP SEP 2018 Programme
5. Programme Proposals for 2019
6. IAP Structure and Governance
7. IAP SEP Global Council Chair 2019 – 2022
8. Host for IAP SEP 2019 Meeting

The meeting also announced that the Dr. Mustafa El Tayeb is the incoming Chairman of IAP SEP Global Council from 2019 and the National Sudanese Academy of Sciences will take over as the lead academy from January 2019.

1.2 International Forum on Science Education, 9 April 2018, Islamabad, Pakistan: Quality Science Education at Schools – A Must for Quality Higher Education and Economic Development

The forum was organised by the ECO Science Foundation (ECOSF) in conjunction with the IAP SEP 2018 Global Council Meeting and the OBOR Fusion of Civilisations Curriculum Design Meeting. The Forum attracted more than 200 participants including 20 from 12 countries and diplomats from the Pakistan-based foreign embassies. The international Forum deliberated in depth the interaction of the digital and development revolution, non-formal science education, science museum, women in science, role of media in science education and in promoting linkages between science and sustainable development and STEM Education based on IBSE. The Forum culminated in the Islamabad Declaration and Recommendations. (see Appendix 1)



Group Photo of Science Education Forum in Islamabad



IBSE Panel Session in Islamabad

1.3 International Conference on Climate Change Education, Kuala Lumpur 7 – 8 May 2018

The above conference was held in collaboration with the International Science, Technology and Innovation Centre for South-South Cooperation at its 10th anniversary celebration. 129 delegates from 20 countries attended the Conference. A Declaration and Recommendations was issued at the end of the Conference and among others calling up stake holders to initiate follow up events throughout the world on climate change education and closer collaborations among international agencies such as IPCC, International Council for Science (ICS), IAP SEP, Office

for Climate Education on effective implementation of climate change education throughout the world. (The Declaration and Recommendations is attached in Appendix 2)



Reception by HE French Ambassador to Malaysia at his Residence



HE French Ambassador to Malaysia with Four Malaysian Primary Science Teachers who went to Paris on Malaysia France Primary Science Exchange Program 2017-2018



IAP SEP Global Council Chairmen: Jorge Allende, Chile (courtesy Photoshop); Pierre Lena, France; Lee Yee Cheong, Malaysia and Mustafa El Tayeb, Sudan

1.4 Training Workshop for IBSE Master Trainers on Climate Change Education, Kuala Lumpur 27-30 August 2018

The training workshop was held in collaboration with the Office for Climate Education and was attended by thirty seven participants including nine international participants presenting five countries. The workshop was in two parts – the first was on climate change education and was facilitated by officers of the Office for Climate Education. The second part gave focus on how to be effective trainers which was facilitated by trainers from the Ministry of Education, Malaysia. Both components had very good reviews by the participants in terms of acquisition of new skills and knowledge, relevance to work, conduct of workshop (IBSE and hands-on) and the field visit.



Poster Session

As part of the training workshop, all participants were requested to prepare in advance a poster that showcase the IBSE projects they had been carrying out in their respective schools or organisations. The topic would ideally be on climate, otherwise other topics were acceptable too. These posters were put up for display throughout the programme. Participants presented their posters and exchanged experiences during the training workshop.



1.5 Forum on Promoting Science Literacy Through Science Museums of ASEAN Countries 25 August 2018, Bangkok, Thailand

The above Forum was part of the National and Technology Fair held in Bangkok. It was an exclusive forum organised by the National Museum of Thailand and was attended by four members of IAP SEP Global Council (Dato' Lee Yee Cheong, Dr. Carol O' Donnell, Dr. Manzoor Soomro and Dr. Aphiya who was also the host), representatives of national and agencies associated with science communication and science literacy from Indonesia, Philippines, Malaysia, Myanmar, Thailand and the Office for Climate Education, UNESCO Principal Regional Office for Asia and the Pacific (PROAP), as well as the group members of the OBOR Fusion of Civilisations Curriculum. The Forum was organised as a platform to share on experiences of utilising existing facilities in raising public science literacy. Attendees who gave presentations talked about initiatives taken their respective organisations which include science literacy modules, exhibitions, forums which cover topics such as water, food security, waste management, health, energy, climate change and internship for youths.



1.6 One Belt One Road Fusion of Civilisations Curriculum Project

Four meetings were held to discuss and edit the structure, content, teaching and learning activities of the draft resources as well as strategy for pilot.

- i. Fusion Of Civilisations Workshop 9 April 2018, Islamabad, Pakistan
- ii. Fusion of Civilisations Curriculum Group Meeting, 24 August 2018 Bangkok, Thailand
- iii. Fusion of Civilisations Curriculum Group Meeting, 18&19 September 2018, Beijing, China
- iv. Fusion of Civilisations Curriculum Editing Sub-Group Meeting 4-7 December, Nanjing, China 2018

A draft project publication has been prepared in the form of teachers and pupil materials which can be used directly in the classroom. The modules highlight the science and technology innovations of the time along the land and maritime silk roads which contribute to modern science of today. The draft modules will be piloted in group member's countries – Malaysia, China, Pakistan, Indonesia and Thailand, from March – May 2019. A report of the pilot will be produced in June 2019 and the findings will provide inputs into the finalisation of the modules for printing.

The project publication will have the following structure:

- A. Preface
- B. Background of FoCED
- C. Guideline for teachers
- D. Content:
 - Part 1: Land Silk Road
 - Part 2: Maritime Silk Road
 - Assessment at the end of each Part

Each Part will comprise learning units and based on the following structure:

- Brief general introduction to the Land Silk Road and Maritime Silk Road for the respective parts of the modules
- Overview
Introducing the great travellers (Ibn Batuta and Zheng He) to the reader.

The above will precede the learning units

- Learning Unit (With title)
Each unit to contain the following:
 - The Story (with title- students materials)
Contains the narrative part on the travels of the great traveller along the silk road or about the technological discovery of the time
 - Activity
Contains the suggested activity for students that are related to the story. Each activity will follow the structure as follows:
 - Introduction
 - Level
 - Objectives
 - Focus Question(s)
 - Inquiry
 - 1. Materials
 - 2. Procedure
 - 3. Suggested method (if any)
 - Connectivity
 - Worksheet (student's materials)
 - Suggested reading materials (teacher's materials)
 - Glossary (at the end of each Unit)

The Land Silk Road comprises three (3) Learning Units:

Unit 1: Water Resources

Activities:

- 1.1 The windlass
- 1.2 The water wheel
- 1.3 The water pump
- 1.4 An oasis in the desert

Unit 2: Astronomy

Activities

- 2.1 Telescope
- 2.2 Astrolabe
- 2.3 Height of buildings

Unit 3: Architecture

Activities:

- 1.1 Pillars
- 1.2 The roof

1.3 Kuwait Water Tower

1.4 The Dome

The Maritime Silk Road comprises five (5) Units:

Unit 1: Zheng He's and His Voyages

Activities:

1.1: Looking for Polaris

Unit 2: Zheng He's fleet

Activities:

2.1: Know your junk

2.2: Zheng He's junk

Unit 3: ZH navigation tools

Activity:

3.1: Make Your Own Compass

Unit 4: Traders sail to Malacca

Activities:

Activity 4.1: The Wind Socks

Activity 4.2: The Effect of Monsoon/Tsunami

Unit 5: Malacca as a trading centre

Activities:

5.1: Spices in My Favourite Food

5.2: Food Preservation Experiment

5.3: Testing My Own Recipe



Group Meeting in Islamabad



Group Meeting in Beijing



Group in Beijing



Group in Bangkok Meeting



Editing Sub Group in Nanjing

2.0 PROGRAMS SUPPORTED BY IAP SEP

2.1 Climate Change Education

From the momentum generated by the International Climate Change Conference of May 2018 in Kuala Lumpur and actively promoted by IAP SEP Global Council incoming Chairman Mustafa El Tayeb, a high level multistakeholder “Brainstorming Session on Science Education and Climate Change Education” was held in UNESCO Head Office in Paris on 9 November 2018

It is well worth noting the attendance at the Session:

1. Dr. Flavia Schelegel – ADG for Natural Sciences, UNESCO
2. Dr. Stepania Gianni – ADG for Education, UNESCO
3. Dr. Vladimir Ryabinian – ADG Inter Governmental Oceanographic omission (IOC) UNESCO
4. Dr. Mustafa El Tayeb, IAP SEP Chairman 2019-2022
5. Sharifah Maimunah, Executive Director, ISTIC
6. Prof. Pierre Lena – Chairman, Office for Climate Education
7. Dr. David Wilgenbus – CEO, Office for Climate Education
8. Dr. David Jasmin – CEO, La main a la Pate Foundation
9. Ms. Laurence Constantini – Director, La main a la Pate Foundation
10. Peter McGrath, InterAcademy Partnership (IAP)
11. Dr. Salvatore Arico, UNESCO/IOC
12. Dr. Lucila Spini (ISC) – International Science Council (ISC)
13. Ms. Nathalie Forproix – International Union for Biological Sciences and TROP ISCU
14. Mr. Jacques de Me'reuil, Executive Director World Federation of Engineering Organisations (WFEO)
15. Ms. Julia Hess – UNESCO Programme Specialist, Education for Sustainable Development

16. Antoine Cardey, Associate Project Officer, UNESCO Section for Youth, Literacy and Skills Development
17. Mr. Imteyaz Khodabux – Programme Specialist, UNESCO Science Sector
18. Dr. Yoslan Nur, Programme Specialist, UNESCO Science Sector
19. Mr. Peter Dogse, Co-Chair UNESCO Task Force Team on Climate Change

The meeting was informed on the various activities related to science education and climate change education undertaken by UNESCO sectors, associated offices and other agencies represented.

The following matters were raised:

- a. The critical role of education for all levels of society
- b. importance of classroom teachers in effecting climate change education
- c. Implementation at local level – having regional conferences similar to what ISTIC has done
- d. The importance of teacher trainers
- e. The critical role of high level policy makers
- f. The role of engineers and scientists who can provide technological solutions and dimensions
- g. Role of science centres / museums in promoting science communication
- h. Establishment of OCE as a UNESCO Category 2 centre
- i. The need for co-ordination between the UNESCO science and UNESCO education sectors as an organised effort.
- j. Use of open –source approach for dissemination
- k. Important role of ‘helping’ rather than just ‘coordinating’

The meeting’s conclusions were:

- l. The recommendations and outcomes of session will be collated and coordinated by the Secretariat
- m. With regards to the establishment of OCE as a UNESCO category 2 centre, it was suggested that the meeting could provide some pressure to UNESCO.

2.2 “Mosquito! Community Research Guide” by Smithsonian Science Education Center (SSEC)

The project was suggested at the IAP SEP Global Council meeting in Santiago, Chile April 2017 then at the height of the Zika Pandemic in Latin America. IAP SEP Global Council member Carol O Donnell, Director of SSEC offered to undertake the curriculum design on mosquito borne diseases for schools based on the IBSE methodology. Funding was obtained from the Moore Foundation through IAP SEP IAB member Bruce Alberts and the Smithsonian Institute.

Mosquito! Community Research Guide - English

Inspired by a universal call-to-action from the InterAcademy Partnership (IAP) within the United Nations Sustainable Development Goals, the Smithsonian Science Education Center (SSEC), in conjunction with the Smithsonian Tropical Research Institute (STRI) and other organizations, is bringing together [a global team to design inclusive and equitable research-based science education.](#)

The Guide is available for free download from:

www.interacademies.org/47237/Mosquito-Community-Research-Guide-English



IAP SEP supports the translation of the Guide into as many languages as possible so that the Guide can be tested in schools throughout the world.

IAP SEP Global Council Chairman Lee Yee Cheong has suggested that using the Guide as the template, a comprehensive curriculum design project for schools entitled “Healthy Living for Body and Mind” should be undertaken to strengthen children’s resilience against pandemic diseases, obesity and poor health in old age. The curriculum should also include children’s defence against abuses both physical and mental as well as on-line harassment. He has written to the Director General of World Health Organisation for support.

2.3 The Belt and Road Science Education Coordinating Committee, Beijing

IAP SEP has been very supportive of the Belt and Road Teenager Maker Camp and Teacher Forum organised by CAST Children and Youth Science Centre in Beijing since December 2017.

During the Second Belt and Road Teenager Maker Camp and Teacher Forum held in Beijing, November 2018, the above Coordinating Committee was launched. Dato Lee Yee Cheong was elected Vice President in charge of science education resources. It is his intention to obtain CAST’s continued support of the Fusion of Belt and Road Civilization Curriculum Design Project as well as the proposed “Healthy Living for Body and Mind” project.



The second Belt and Road Teenager Maker Camp and Teacher Forum with 250 participants from 29 countries.



The President and Vice Presidents of the CAST Belt and Road Science Education Coordinating Committee

2.4 The CAST World Science Literacy Conference September 2018 Beijing

Dato Lee Yee Cheong was invited as a speaker.



2.5 Shanghai International Natural Conservation Conference, November 2018

Through the introduction of IAP SEP Global Council member Aphiya Hathayatham, Dato Lee was invited by the Director, Shanghai Science and Technology Museum, as a keynote speaker.



2.6 AEMASE 2018 Paris

Dr Sharifah Maimunah represented Dato Lee as a speaker at the above Conference.

Lee Yee Chung

IAP SEP Global Council Chairman
Kuala Lumpur 30-12-2018

Appendix 1



International Forum on Science Education 9 April 2018, Islamabad, Pakistan

Islamabad Declaration

In conjunction with the 2018 meeting of IAP SEP Global Council, the International Forum on Science Education was held in Islamabad on 9 April 2018, hosted by the ECO Science Foundation, the Pakistan Higher Education Foundation, Pakistan Academy of Sciences and Alif Ailaan. The International Forum was themed “*Quality Science Education at Schools- A Must for Quality Higher Education and Economic Development*”. The Forum attracted more than 200 speakers and participants from 12 countries as well as some diplomats from Pakistan based Embassies. The International Forum engendered animated and constructive deliberations, culminating in the recommendations and outcomes in this Islamabad Declaration.

The world today is in the throes of the 4th Industrial Revolution which is caused by the nexus of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge; and technology breakthroughs in fields such as Artificial Intelligence, Robotics, the Internet of Things, Autonomous vehicles, 3-D printing, Nanotechnology, Biotechnology, Materials Science, Energy storage, and Quantum computing. The 4th Industrial Revolution is really the Digital Revolution. Its impacts on the developed world have been the widening wealth inequality and massive unemployment in traditional sectors of the economy.

The world is also in the grip of poverty. Some 60% of world population in the developing world still live in poverty. Their human condition is further exasperated by the adverse impact of climate change. Fortunately the developing world is following a different development model from the developed world. This model is based on inclusive infrastructure development and nurturing of enterprises in the agricultural, mineral resources, manufacturing, trading and other services sectors. This is exemplified by China which has lifted her huge population out of poverty in three decades by more than satisfying the basic necessities of life they term “clothing, food, shelter and transportation” guided by their age-old precept “To get rich build road first” . China is sharing her development model with the rest of the developing world through the One Belt One Road Initiative. This is “the Development Revolution” of the developing world!

After nearly 25 years of experience throughout the world through the persistent

advocacy of the Interacademy Partnership (IAP) of some 110 national academies of sciences and 30 national academies of medicine under its Science Education Program (SEP), it has been proven that Inquiry Based Science Education (IBSE) methodology and approach for teaching and learning Science, Technology, Engineering and Mathematics (STEM) from preschool upwards, enhances the curiosity and creativity of children and youth and improves their language and numerical literacy. Moreover, IBSE/STEM education enables children and youth to think critically and to question certain cultural, social and consumption norms unless they have been proven by evidence, to be beneficial. In addition, IBSE for STEM education leading to higher education, will assure the human resources necessary for the digital revolution and the development revolution as well as equip the world with a rational and discerning citizenry to ensure global peace, harmony and prosperity.

The International Forum deliberated in depth the interaction of the digital revolution, the development revolution and IBSE/STEM education from preschool through primary secondary and tertiary/higher education education to lifelong learning. The International Forum is convinced that through their expert use of social media and mobile communication, IBSE/STEM savvy children and youth can be the agents of change to lead humanity towards sustainability.

Therefore the Islamabad Declaration, appreciating the efforts of Pakistan Academy of Sciences, ECO Science Foundation, Higher Education Commission of Pakistan and Alif Ailaan Pakistan in organizing the Forum,now:

- Calls on all IAP member academies of sciences and their IBSE/STEM partners to redouble their commitment to IBSE/STEM education, especially the enhancement of IBSE/STEM education by the application of digital technologies through active participation of UNESCO's flagship programs like ICT and Education 2030, Mobile Learning Week and Open Source Education etc.
- Calls on all IAP member academies of sciences to lobby their national governments to establish more interactive science museums/science centres. In the interim, to get their national and provincial museums to set up a STEM section to spread STEM literacy to their citizens.
- Calls on IAP SEP Global Council to actively support Climate Change Education- the IBSE way.
- Calls on industry, particularly the infrastructure and digital technology related enterprises to assist national academies of science and their national governments to enhance STEM education (following IBSE approach) policies and initiatives to ensure the formation of the creative and innovative human capital.
- Calls on China under the One Belt One Road Initiative; (i) to invest in the IAP SEP Project of Fusion of OBOR Civilizations Curriculum Design for Schools; (ii) welcome the wider participation of the youth from developing countries in

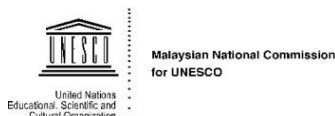
their OBOR Teenager Maker Camp and related digital activities; (iii) construct digitally interactive mobile exhibits (IBSE based approach) on the scientific and technological inventions and innovations in OBOR civilizations and (iv) uplift technical universities in developing countries in their digital technology curriculum by faculty and student exchanges and provision of laboratory equipment etc. Pakistan with China Pakistan Economic Corridor (CPEC) project could be a priority.

- Appreciates the establishment and efforts of Pakistan Alliance for Maths and Science (PAMS) and ECOSF for advocating and promoting IBSE/STEM education in Pakistan and ECO member countries respectively.
- Calls upon National Academies of Sciences in the 10 ECO member states to cooperate and collaborate with ECOSF for of IBSE and STEM in their countries.
- Calls on Pakistan, the host country of this International Forum to devote more resources to IBSE/STEM education in schools so as the assure quality intakes into their universities, which should lead to sustainable economic development.

Appendix 2



Supporting Organisations:



ISTIC 10th Anniversary International Conference on Climate Change Education 7 - 8 May 2018, Kuala Lumpur, Malaysia

DECLARATION AND RECOMMENDATIONS

In conjunction with its 10th Anniversary, the International Science, Technology and Innovation Centre for South-South Cooperation under the auspices of UNESCO (ISTIC) held the ISTIC International Conference on Climate Change Education from 7-8 May 2018 in Kuala Lumpur. The conference was attended by 127 delegates from 20 countries namely Algeria, Bangladesh, Cambodia, Egypt, France, Gambia, Ghana, India, Indonesia, Malaysia, Nigeria, Philippines, Senegal, Seychelles, Singapore, Sudan, Trinidad & Tobago, Thailand, Tunisia, Zimbabwe, and 10 international organisations.

The international conference focused on integrating climate change education into the curriculum, best practices and resources for learning within the context of the UN SDG 13 “Climate Action” which recognises the importance of education in its target 13.3 and indicator 13.3.1

- 13.3 Improve education, awareness-raising and human and institutions; capacity on climate change mitigation, adaptation, impact reduction and early warning.
- 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula.

The United Nations Climate Change Convention (UNCCC, 1992) and the Paris Agreement (UN, 2015) also recognise the importance of climate change education by stating that “The development and implementation of education and training programmes... in particular for developing countries“ (UNCCC Art. 6.b.ii) and “Parties should take measures.. to enhance climate change education” (Paris Agreement Art 12). The Conference also anchored itself on the Inter-Academy Partnership (IAP) Statement on Climate Change and Education.

The International Conference was officiated by Datuk Seri Dr. Mohd. Azhar bin Haji Yahaya, Secretary-General, Ministry of Science, Technology and Innovation Malaysia, representing the Minister and Dr. Shahbaz Khan, Director, Regional Centre for Science for Asia and Pacific and UNESCO Representative for Brunei Darussalam, Indonesia, Malaysia, the Philippines and Timor-Leste, representing the UNESCO Director-General.

Two scene setting lectures provided the current scenario which outlined the challenges facing the world within the context of climate change, its impacts particularly on the poor, and the need to transform consciousness, understanding, the will to act among the population and youth to address climate change and the importance of STEM education in developing the human capital especially for south countries. Both lectures stressed that time for action against the adverse impacts of climate change on our globe is running out.

The International Conference deliberated the issues under the following themes:

- i. Climate Change Education: Role of Inter-governmental Organisations
- ii. Climate Change Education: Role of National Government, Academia and STI Community
- iii. Climate Change Education: Sustainable Development Practices
- iv. Climate Change Education: Institutions and Resources

Recognising the urgent need to act in addressing the global challenges, the Conference concluded with the following recommendations:

1. Sensitise policy makers, politicians and national governments on the importance of climate change education in educating all levels of population and make legislations and regulations to make climate change education compulsory in school curricula.
2. Enact legislation and/or regulation to integrate climate change education across school curricula through formal and informal learning at all levels.

3. Adopt inquiry-based learning to develop analytical and creative thinking of the challenges in climate change and in-depth mitigation and adaptation solutions.
4. Strengthen teachers' and educators' capacities to deliver accurate information, promote critical thinking about and take action on climate change mitigation and adaptation, taking into consideration local environment and cultural circumstances
5. Allocate adequate resources to museums and science centres to carry out informal out-of-school and interactive activities on climate change in parallel with formal climate change education.
6. Involve young people to develop innovative solutions in addressing the challenges of climate change. The young are intrinsically more concerned and caring about our environment. With their expert use of social media as convening power, they will be a potent societal force for sustainable development.
7. Engage industries so as to promote, raise awareness and provide inputs on best practices and trends in their sectors for sustainable development.
8. Make national academies of science as lead in motivating and energizing the national STI community in government, academia, industry and civil society to act in concert in the effective implementation of climate change education.
9. Initiate follow-up events on climate change education throughout the world in collaboration with stakeholders such as IPCC, UNESCO, the Office of Climate Education and the Inter-Academy Partnership-Science Education Programs (IAP-SEP). ISTIC is willing to coordinate the organization of such events in developing countries, befitting its role as the acknowledged international platform for south-south cooperation
10. Ensure the active participation of international organisations such as UNESCO, International Council for Science (ICSU), Inter-Academy Partnership Science Education (IAP SEP), International Panel for Climate Change (IPCC) and ISTIC with the Office for Climate Education (OCE) in effective implementation of climate change education on the ground throughout the world.