Science to Enable and Empower Asia Pacific for Sustainable Development Goals
Introduction

Asia and the Pacific has achieved remarkable development in recent years. However, several challenges remain. Between 2002 and 2013, more than 700 million people in the region moved out of extreme poverty, while between 2000 and 2016 the region’s share of global GDP increased from 29% to 41%, in terms of purchasing power parity. At the same time, Asia and the Pacific remains highly vulnerable to a wide range of hazards. The region is regularly affected by typhoons, tsunamis, floods, droughts and fires. A highly diverse region home to half the world’s population, Asia and the Pacific stretches from the highest mountain ranges in the world to over 60,000 islands, a number of Small Island Developing states (SIDS) and Least Developed Countries (LDCs).
As a specialized agency of the United Nations, UNESCO works to create the conditions for dialogue among civilizations, cultures and peoples, based upon respect for commonly shared values. The UNESCO Jakarta Office serves two dimensions: as a Cluster Office, representing UNESCO in Brunei Darussalam, Indonesia, Malaysia, the Philippines, and Timor Leste in all UNESCO fields of competence, and as a Regional Bureau for Science, covering the Asia and Pacific Region, with programmes in Freshwater, Oceans, Environmental Sciences, Basic and Engineering Sciences, Earth Sciences, Local and Indigenous Knowledge Systems (LINKS), and Small Island Development States (SIDS). The Office has embarked on a strategy that aims at maximizing the effectiveness, impact and visibility of its programmes, including UNESCO’s established scientific programmes such as the International Hydrological Programme (IHP), Man and the Biosphere (MAB), the International Geosciences and Geoparks Programme (IGGP).

While UNESCO’s Medium-Term Strategy for 2014-2021 (document 37 C/4), adopted by 195 Member States of UNESCO, guides the Organization’s strategic direction, this Regional Support Strategy is an initiative of the Regional Science Bureau for Asia and the Pacific to clarify its strategic programme priorities and approach in the field of science.

In September 2015 the United Nations adopted the 2030 Agenda for Sustainable Development with its 17 Sustainable Development Goals (SDGs) and 169 targets. The 2030 Agenda is based on principles of universality, pledging "leaving no one behind" and "action in all countries for all countries". This Science Support Strategy covers a critical time during which the world is embarking on the implementation of the SDGs. Promoting the balanced integration of the economic, socio-cultural and environmental dimensions in policy-making and development planning processes at all levels is the core of the catalytic actions for transformation towards sustainable development. In this context, the Regional Bureau’s Science Programmes are in the process of continuously strengthened their reach and engagement at all levels to respond to the needs of the region (Figure 1) by:

• Helping develop a thorough understanding of the origin, scope, complexities and inter-relatedness of key challenges of this century.

• Addressing these challenges by steering a number of important transformational shifts in key sectors, such as energy, food, and water. Sustainability Science could be an effective approach to help better understand and address the multi-faceted challenges. Meanwhile, STI needs to focus on foresight and on mobilizing and using ‘big data’ for modeling, scenario development, and monitoring to ensure the transformational shifts lead towards sustainability.

• Ensuring inter-sectoral knowledge sharing & collaboration by creating synergy between UNESCO environmental programmes (IHP, MAB, IGGP, DRR) and inter-sectoral cooperation (Education, Culture, Communication and Information, Social Human Sciences) needs to be highlighted in order to address common challenges, foster knowledge and information sharing, provide a comprehensive pathway to the achievement of SDGs.
**Vision**

*Fostering Science for Sustainable Development in the Asia-Pacific Region*

The UNESCO Regional Science Bureau for Asia and the Pacific will contribute to the ultimate vision where Member States will be able to meet society’s needs via science based solutions by fostering dialogue, cooperation, networking, capacity building and knowledge-sharing with the scientific community, decision makers, and civil society in the Asia-Pacific region as well as at country level.

**Mission**

- Work with Member States on key issues and problems in Asia and the Pacific, in order to engage science in the service of human needs and improve both environment and quality of life of the region’s peoples.

- Mobilize science, technology, innovation and policy, for enabling Member States in the region on addressing new and emerging challenges that could facilitate to set a course for a sustainable future.

**Key roles of Regional Science Bureau for Asia and the Pacific**

As a specialized agency of the United Nations, UNESCO works to create the conditions for dialogue among civilizations, cultures and peoples, based upon respect for commonly shared values. The UNESCO Jakarta Office serves two dimensions: as a Cluster Office, representing UNESCO in Brunei Darussalam, Indonesia, Malaysia, the Philippines, and Timor Leste in all UNESCO fields of competence, and as a Regional Bureau for Science, covering the Asia and Pacific Region, with programmes in Freshwater, Oceans, Environmental Sciences, Basic and Engineering Sciences, Earth Sciences, Local and Indigenous Knowledge Systems (LINKS), and Small Island Development States (SIDS). The Office has embarked on a strategy that aims at maximizing the effectiveness, impact and visibility of its programmes, including UNESCO’s established scientific programmes.

**The Bureau will:**

- continue to develop regional flagship programmes, support regional networks and the foster science-policy interface through UNESCO’s major science programmes, strengthen STI capacities, and enhance regional scientific cooperation for inclusive sustainable development. It will exercise leadership in ocean and fresh water issues and develop holistic solutions to climate change adaptation and disaster risk reduction and will be centrally involved in bridging the multiple gaps between science, policy and society by mobilizing and supporting multidisciplinary scientific knowledge to inform decision-making;

- recognize and promote the ethical, social, environmental and economic aspects of
sustainable development and the eradication of poverty by encouraging the design and application of effective, innovative approaches and policies. Policy-making will be coupled with concrete action through UNESCO programmes on the ground at the national and regional levels, through mechanisms to provide science policy advice and capacity-building that is robust, socially inclusive, rights and ethically-based.

• put into practice integrated science for sustainable development, or sustainability science. Sustainability science draws on the full range of scientific, traditional and indigenous knowledge in a transdisciplinary way in order to identify, understand and address economic, environmental, ethical and societal challenges.

• focus on concrete mechanisms or examples of how STI will be driven/achieved. Initiatives will be developed, such as the UNESCO-ASEAN Framework Agreement for Cooperation and the Joint Programme of Action – that contribute to cooperation among Member States in the region and respond to challenges emerging under the 2030 Agenda.

• pay special attention to the opportunities offered by green economy approaches, by working with Member States to provide a reference policy framework, highlighting the opportunities that a greener economy could generate for a more sustainable growth in countries of Asia and the Pacific region.

Figure 1. Regional Bureau’s initiatives in relation to SDGs and targets.
Strategic Focus Areas

The Bureau assists Member States of Asia and the Pacific region in building knowledge societies based on science and sustainable development by focusing on three main axes (Figure 2) to achieving SDGs:

**Axis 1: Science, Technology and Innovation: Creating a policy environment to enable knowledge generation and application with consideration of gender equality**

The development of knowledge societies involves the implementation of public policies which are based on holistic scientific research in order to address the profound and complex global and regional challenges and social transformations taking place in all Member States. Specifically, UNESCO will work to provide sound policy advice in assisting countries of the region to invest in STI, to develop national science policies, to reform their science systems and to build capacity to monitor and evaluate performance through STI indicators. For instance, the Global Observatory of Science, Technology and Innovation Policy Instruments (GO-SPIN) and STEM and Gender Advancement (SAGA) aiming at providing key information on STI governing bodies and improving the situation of women and reducing the gender gap in science, technology, engineering and mathematics (STEM) fields.

**Axis 2: Mobilizing international collaboration to advance knowledge generation, capacity development and provide models for local sustainable development**

Since its foundation, UNESCO has been a catalyst for and promoter of major international scientific programmes in the fields of oceans, freshwater, ecological, earth and the basic sciences, and has worked to create and share knowledge to bridge divides. The Organization today is both a pioneer and leader in international scientific cooperation. Through key global scientific programmes such as the Intergovernmental Oceanographic Commission (IOC), the International Hydrological Programme (IHP), the Man and the Biosphere Programme (MAB) and its World Network of Biosphere Reserves, the World Heritage Convention's natural World Heritage sites, the International Geosciences Geopark Programme (IGGP) and the UNESCO Global Geoparks, a significant body of scientific knowledge has been created and disseminated all over the world. With three site-based networks – World Heritage Convention, the World Network of Biosphere Reserves and the UNESCO Global Geoparks – UNESCO’s values, approaches, methodologies and sustainability frameworks are present on the ground in the organization’s member states, comprising a globally distributed network of special places of globally significant natural value. Complementing these networks are UNESCO-affiliated institutions such as the UNESCO Category 2 Centre HIST in Beijing, China, dedicated to the application and development of space-based technologies for the sustainable management of UNESCO-designated sites. Furthermore, UNESCO-affiliated science and technology parks, science centers and science museums contribute to the popularization of science among youth, with a special focus on women in science.

All of these major international scientific collaborative programmes contribute to the building of scientific capacity among UNESCO Member States in Asia and the Pacific, and form the core scientific knowledge base for, among others, raising awareness on the importance of science education, disaster-risk reduction, engineering science, and biodiversity conservation.
Axis 3: Expanding access to and equitable sharing of knowledge in all domains

Advances in STI generate enormous new potential for information and knowledge exchanges and for the emergence of new patterns of communication and exchange of ideas. In a relatively short time, STI education has moved from a rigid, fixed system to a highly mobile structure. Significantly, one of the main consequences of technology today is mobility. Internet, whether fixed or mobile, and mobile telephony, together with traditional media such as radio and TV broadcasting, enable large parts of the world’s population to have quasi-permanent access to information and knowledge from almost everywhere on the planet and at any time. The right to access these new technologies and all aspects of knowledge available through these technologies is fundamental to the mandate of UNESCO.

To foster access to knowledge as a mainspring of innovation, the Jakarta Office will continue to promote and support the utilization of Information and Communication Technologies (ICTs) in domains such as access to culture and related knowledge systems, monitoring World Heritage Sites, recording, registering and sharing knowledge about Intangible Cultural Heritage, digitalizing museum’s collections, building e-platform for geoscience training and capacity building, developing mobile applications of VISUS Finder for disaster deduction. The International Information and Networking Centre for Intangible Cultural Heritage in the Asia-Pacific Region (ICHCAP), a Category-2 Centre under the auspices of UNESCO, is working with many countries in Asia and the Pacific to restore and digitalize intangible cultural heritage related data, disseminate and use it for education and promotion purposes. The bureau will promote the use of tools such as Open Access (OA) - the online availability of scholarly information to everyone, free of most licensing and copyright barriers to enable global knowledge flows for the benefit of scientific discovery, innovation and socio-economic development of researchers, innovators, teachers, students, media professionals and the general public.
Science activities of UNESCO Families in Asia and the Pacific
Introduction

After its establishment in 1947, the Pakistan Academy of Sciences (PAS) has played a pivotal role in the popularization science and encouraging scientists and technologists for promoting research in emerging areas of science. PAS comprises of top notch scientists of the country with main role in advising the government for policy making, research commercialization and initiating projects to meet the growing requirements of the country. PAS also collaborates with other academies and associations for promoting science and technology. One of the launched campaigns under the slogan of “Making Pakistan Science Conscious” got tremendous appreciation from the international community.

PAS remained committed to implement the agenda of sustainable development and therefore has frequently embarked on projects related to the UN Sustainable Development Goals. Different conferences, workshops and dialogues are frequently organized by PAS in collaboration with national/international partners in the context of sustainable development goals. These events allows interaction of senior scientists and policy makers with young students for implementing the UN agenda for sustainable development. The recommendations are then presented to the relevant government ministries.

Activities

AASSA-PAS Regional Workshop on “Complimentary Medicine as an Answer to the Challenges faced in Achieving Sustainable Goals in Health”: Recognizing the reach and importance of alternative medicine in the context of “SDG 3 GOOD HEALTH AND WELL BEING”, a 3 day workshop was organized to highlight the advances in alternative care and issues in commercialization of herb research.

Challenges in Water Security to Meet the Growing Food Requirement*: The rapid rise of population necessitates the need of vibrant policies and scientific approaches to cater the future needs. This 3 day activity was directly aligned with the SDG 2,8,6 and 13 i.e. ZERO HUNGER, GOOD HEALTH AND WELL BEING, CLEAN WATER AND SANITATION AND CLIMATE ACTION respectively.

Workshop on Biosafety and Biosecurity in Life Sciences Research: Science with safety, security and responsibility has always been a popular slogan of PAS. Numerous workshops are conducted to raise awareness about the biosafety, biosecurity and DURC in life Sciences research. Young students were encouraged to present their views in the form of posters.

Policy makers and practitioners awareness workshop on Dual Use Education

Workshop on raising awareness on DURC in Biotechnology One Health Research Fellowships in Pakistan

Achievements:

- Literature produced in the form of books and papers
- Curriculum revision by introducing “Bioethics and Responsible Conduct of Science” Awareness about SDGs

Conclusion

Pakistan Academy of Sciences is leading several efforts to implement the agenda of sustainable development. Linkages between S&T institutions in Pakistan with world-class institutions in technologically advanced countries is essential to the cause. Exchange of personnel and development of mutual research programs will help improve R&D competences. More efforts are required to build international collaborations for the implementation of UN sustainable agenda.

Acknowledgment
Albay Biosphere Reserve

Introduction
Albay Biosphere Reserve is the third BR in the Philippines to be part of WNBR. ABR encompasses the whole of Albay Province including its islands and its adjacent waters. Its terrestrial core areas are composed of one national park which houses the perfectly cone shaped Mayon Volcano, a watershed forest reserve, dozens of caves, and two geothermal reserves. Its aquatic core areas include several mangrove forests, 20 turtle spawning grounds, and 15 marine sanctuaries.

Activities
1. Implementation of LAWIN Biodiversity Conservation and Protection System in the terrestrial core areas
2. Orienting LGU planners re: BR concepts and its integration in local plans
3. Inclusion of ABR concepts in Local Tourism Development Plans
4. Purposive cultural mapping of all local government units

Conclusion
The completion and adaptation of the management plan is a huge accomplishment for ABR. However, it is still imperative that in the next three years, a sturdy management regime be organized and continuous education and networking with LGUs be tirelessly conducted.

Acknowledgment
Provincial Government of Albay
Component Cities and Municipalities of Albay
Bicol University
Department of Environment and Natural Resources
UNACOM Philippines
Philippine Biosphere Reserves Network
Association of Academies and Societies of Sciences in Asia

Prof. Yoo Hang KIM, President, AASSA

AASSA in General
The principal objective of AASSA is to act as an organization in Asia and Oceania which plays a major role in the development of the region through science and technology.

The AASSA serves as a forum to discuss and provide advice on issues related to science and technology, research and development, and the application of technology for socio-economic development.

Activities (Workshops)
Since 2012 a total of 40 Workshops have been organized in different member countries.

Through these Workshops AASSA is successfully:
1. Communicating and sharing knowledge, experience and expertise in SDGs-related topics
2. Engaging with stakeholder and high-level policy-makers
3. Gaining maximum exposure to scientific community and general public
4. Extending Scientists human network and establishing new joint programs
5. Capacity building of host academies

Member Academies
Afghanistan, Armenia, Australia, Azerbaijan, Bangladesh, China, Georgia, India, Indonesia, Iran, Israel, Japan, Jordan, Kazakhstan, Korea, Kyrgyzstan, Malaysia, Mongolia, Nepal, New Zealand, Pakistan, Philippines, Russia, Singapore, Sri Lanka, Tajikistan, Thailand, Turkey, Uzbekistan, Vietnam

Objectives of AASSA
1. Sustainable Development In Asia (SDA)
2. Science Education in Asia and Oceania
3. Women in Science and Engineering (WISE)
5. Economic Advancement through Science, Technology and Innovation

Publication of AASSA’s FNSA Report

Women in Science and Engineering

Science to Enable and Empower Asia Pacific for SDGs 2 (SEE AP for SDGs 2)
INTEGRATING TECHNOLOGY INTO FOREST PROTECTION EFFORTS

RADARSAT-2 TECHNOLOGY

In February 2020, Asia Pulp & Paper (APP) launched APP Forest Conservation Policy (PCP) to use RADARSAT-2 technology. In order to provide alert on forest cover change in near real-time.

- High-resolution Synthetic Aperture Radar (SAR) imagery regardless of light and weather conditions.
- Image pixels with spatial resolutions ranging from 1 to 300 meters, providing coverage from HA to 2500 km in a single scene imaging supports high spatial accuracy.
- With 21 imaging modes, it provides the great flexibility and commercial capacity of any SAR mission, enabling users to select the right combination of resolution, polarization and swath width to address their specific requirements.
- Able to serve as a moving source to the most operationally focused SAR mission available.

Forest Cover Loss Alert using RADARSAT-2

- NDA uses RADARSAT-2 satellite to monitor forest cover change alert through APP's pollution sentinel areas in Sumatra and Kalimantan.
- Monitoring data and analysis is being provided to change alert forested areas that are not difficult to identify from the ground.
- The satellite orbits the earth from north-south with an elongated path following the equatorial band. There are 200 geographic regions shown on each orbit and the same orbit position every 24 days cycle.
- After completion of each 24 days cycle, the algorithm developed by NDA will automatically compare the captured data with the data captured in the previous cycle to determine whether or not there is a difference in land use.
- Once the data processing, it will indicate which the forested areas have been converted to other uses as well as identify which forested areas are losing forest cover.
- APP's forest monitoring team has been involved in the process of identifying areas of forested land converted to other uses.

Advantage of RADARSAT-2

- Scalability: Gigantic RADARSAT-2 footprint provides transverse large area coverage.
- Reliability: RADARSAT-2 operates in the same imaging geometry every 24 days.
- Sensitivity: 3 meter resolution includes birefringence highlighting forest cover change.

How We Use The Data

1. After the NDA provides us with analyzed data on forest cover change, APP will verify the data with the existing data on natural forest distribution, topographic data, and regional economic data.
2. APP's team will verify forest cover change in areas with insured forest cover change. Special attention is paid to the location of deforestation and forest degradation.
3. If the cause of forest loss due to illegal activities, it will be reported to the APP's Forest Conservation Management (FCM) to be added.
4. The data from NDA will also be used to identify areas where reforestation needs to be increased or further intervention, such as in the Collaborative Conservation Management (CCM) needs to be added.

IMPACT

Significantly reduced the forest cover loss in our suppliers' protected areas.

In 2015 The areas experiencing forest cover loss reached 65% from total protected areas in APP's suppliers' concession.

In 2017 & 2018 The areas with forest cover loss has been reduced to 0.1% and 0.14% respectively.

0.14% Forest cover loss in protected areas in 2018
Groundwater supply for repeated drought and underlain by saline groundwater in the Northeastern of Thailand

Introduction
The northeastern Thailand is one of the most important areas where groundwater played a significant role in agriculture system. Many areas of the region have faced droughts and shortages of surface water in the dry season, which shows that water resource management in the past has not worked as it should. So that one of the basic reasons for this problem solving that the development and management of groundwater resources are carried out in order to ensure adequate water supply for people in the area. But the important problem of groundwater resources in the northeastern areas is the poor groundwater quality that can be found widespread in middle and lower of the northeastern Thailand. This is because it is dominated by the dissolving of rock-salt. Thus, Department of Groundwater Resources (DGR) has developed and carried groundwater supply from groundwater resources with high potential and good groundwater quality map for the repeated drought area in the Northeastern of Thailand.

Activities
The pilot areas are in 3 critical provinces; Nakhon Ratchasima, Khon Kaen and Maha Sarakham. The represent areas were selected from 15 villages that lack of water supply or salty groundwater quality. The activities consist of 5 mains; (1) field investigation, (2) drilling production wells, (3) construction of one 20-cubicmeter tower tank, (4) installing one automatic water treatment plant, and (5) distribution system by pipe with length not less than 3 kilometers forward to the selected area that there the problems lack of water supply or poor groundwater quality.

Result and Conclusion
Criteria for selected the 15 pilot areas for groundwater development has been launched by studying the secondary data. The field investigation comprises on the study of groundwater consumption from questionnaires survey. There were geophysics investigation, groundwater testing and geophysical borehole logging etc. All these data sets were analyzed by kept current and reflected the true demand at the community. Therefore, the 15 pilot areas from 15 villages will be obtained from the affected by drought, poor groundwater quality as well as poorly organized surface water management. For example, of the distribution system as shown in the picture below.

Acknowledgement
Firstly, I would like to express my sincere gratitude to Department of Groundwater Resources for the continuous budget supporting. Special thanks to the local administrators and stakeholders that cooperated for questionnaires survey. Finally, thanks to many persons unannmed above who help on one way or another to make this study completed.
Introduction

The SATREPS program is a collaboration among Japanese government agencies: JST, AMED, and JICA. Based on the needs of partner countries, JST/AMED and JICA cooperate to promote international joint research targeting global issues with the objective of future utilization of research outcomes. Implemented through collaboration with Official Development Assistance (ODA), the aim of the program is to acquire new knowledge and technology that lead to the resolution of global issues and the advancement of science and technology, and through this process, to create innovations. International joint research under this program also aims to enhance the research and development capabilities of partner countries, and helps create sustainable research systems able to address and resolve issues.

Activities

SATREPS Project Scheme

Overall research and development management of the international joint research is handled jointly by JST, which has expertise in funding research projects at research institutions in Japan, and JICA, which has expertise in technical cooperation in developing countries.

JST will provide financial support to the Japanese research institutions for the project activities in Japan and JICA will provide financial support to the research institutions in the ODA recipient countries within the framework of the technical cooperation projects.

- Research fields
  - Environment/Energy
  - Bioresources
  - Disaster Prevention and Mitigation
  - Infectious Diseases Control

- Duration of research
  - 5 years

- Countries covered by SATREPS
  - ODA "Technical Cooperation Projects" receiving countries

- Project budget
  - Approx. 480,000 USD* per year for each project
  - JST(AMED): 390,000 USD*, JICA: 90,000 USD*

Contributing to SDGs

Joint research activities that address global challenges through science and technology contribute greatly to capacity development and scientific and technological advancement in both Japan and developing countries. They also facilitate research outcomes with the potential of finding wide applicability in society. In view of the foregoing, the program is anticipated to play an important role in Japan’s efforts to actively address the Sustainable Development Goals (SDGs) adopted by the United Nations.

Research Fields

Environment/Energy

- Global-scale Environmental Issues
  - Climate change is occurring, population levels are growing, cities are becoming increasingly overcrowded, and pollution and population levels are increasing. Projects address the growing need for research into technology that can resolve environmental and energy problems.

- Low Carbon Society/Energy
  - Promoting the utilization of renewable energies and new energies, and using energy, including fossil fuel energy, cleanly and efficiently. Research outcomes can potentially be utilized in clean, economical energy systems to cut greenhouse gas emissions and realize a low carbon future.

Bioresources

Bioresources provide us with foods, medicines, animal feeds, textiles, energy, and much more, but sustainable production is threatened today by problems such as desertification, salinization, deforestation, urbanization, and unreliable rainfall. Research activities contribute to collaborative research that can point the way to sustainable means of production and utilization.

Disaster Prevention and Mitigation

Natural disasters are constant danger in Japan, and have resulted in the accumulation of a great deal of knowledge and expertise. In addition to applying this knowledge to disaster and risk reduction in developing countries, collaboration is urgently needed to make further progress in research into earthquakes/tsunami early warning systems and high precision weather forecasting.

More Information

Go to our web site

Science to Enable and Empower Asia Pacific for SDGs 2 (SEE AP for SDGs 2)
Young Technopreneurs for Sustainable 2030

Introduction
- Over 300 students aged 13-18 tackled problems associated with SDG 7 and 12
- Students were given access to interactive learning resources through a learning management system
- Students were mentored online for a period of one month
- Open access to tools, makerspace, challenge statements and technologies was provided

Results
- Students came together to prototype and present their solutions
- Owing to mentorship given, students were able to tackle local problems
- Many solutions proposed were sustainable, both technologically and economically
- Kagu App connects Karanguni men to sellers, thereby prolonging product lifecycles
- The Fiper project converts fruit peels from Ijooz orange machines into usable paper

Activities
Screen images from open content created for the programme

Anticlockwise from left: Modules to introduce youth to the UNSDGs, Walkthrough guide to allow youth to solution for the SDGs, Technical tutorials to help the youth invent new solutions.

Moving Forward
- Leveraging technology to provide open access to content and mentorship.
- https://tinyurl.com/vtsonline

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We thank the Temasek Foundation for their generous support of the project. We also thank our content partners—Sustainable Living Lab, Innovation Garage, Intel, Cognizant, National Environment Agency, Empower AI and other partners for their support in the form of expertise and time.
UNESCO IGCP in the Service of Society

Yongie Kim (Korea Institute of Geoscience and Mineral Resources)
Ozlem Adiyaman Lopes (UNESCO Earth Science and Geo-hazards Risk Reduction Section)

Introduction

Developing an advanced understanding of the Earth’s fundamental processes and resources is essential to fulfill the United Nations 2030 Agenda for Sustainable Development. The International Geoscience Programme (IGCP) is the oldest and most successful example of scientific cooperation between a non-governmental organization – the International Union of Geological Sciences (IUGS) – and an intergovernmental organization – UNESCO. During almost 50 years, this programme has been the gateway to successful scientific careers in pioneering research for thousands of IGCP project scientists. It facilitates international geoscience cooperation among scientists from industrialized and those from low income countries in research on geological problems related to global issues.

KIGAM (Korea Institute of Geoscience and Mineral Resources) contributes to sustainable national development through dedicated research and service across the fields of geoscience and technology. KIGAM’s leading technology is well recognized worldwide. Korea was once the recipient of international aid in the past. However, Korea now stands as a donor country including geoscience technology as well. KIGAM performs capacity building and international collaboration projects for contributing SDGs implementation in developing countries.

Activities

Oversight of IGCP Projects in 2018

- The IGCP has always built bridges between disciplines and between scientists with aims of stimulating cutting-edge research and sharing scientific knowledge for the benefit of all.
- IGCP projects primarily deal with geoscience activities related to global issues within five theme areas: Earth Resources, Global Change, Geohazards, Hydrogeology, and Geodynamics.
- In 2018, 4,483 scientists from 125 countries participated in the delivery of 27 IGCP projects. All the project participants include young scientists (56%), women scientists (32%), and scientists from developing countries (65%). A total of 160 project leaders from 57 countries have taken part.

Case Study and Results / Achievements

- IGCP 652: Reading geologic time in Paleozoic sedimentary rocks (Belgium, Germany, China, USA, Vietnam, France, Brazil)
  - This project facilitates greatly the sharing of project results with scientific communities and publics, including 3 popular science articles and 3 radio interviews, 6 press releases mainly concerning the papers on Nature Communications and Scientific Reports, and 17 newspaper articles related to outcomes of the project.

- IGCP 643: Water resources in Wet tropics of West-Central Africa (Ivory Coast, Benin, Cameroon, France, Niger)
  - The SWCA project aims to build the capacity of laboratories associated with PICASS/TEAU LMI to better predict the responses of water resources to climate change and land use in wet tropics of west-central Africa, such as supporting for exchange students and teacher mobility, funding of laboratory equipment, and helping in setting up new research project.

KIGAM IS-Geo & UNESCO Joint Training Course: Geological Mapping and Exploration (13 sub-Saharan African countries)

- The 12 days training course provided participants an interdisciplinary approach to explore the academic knowledge and practical skills on the expertise of geological mapping and mineral exploration.

Conclusion

Global society is facing critical decisions about how we use our planet and its resources. Our reliance on the Earth for water, energy and mineral resources significantly affects climate change, economic prosperity, environmental impact, and health and wellbeing. At current rates of consumption, and with a future reliant on technology, the range and volume of resources we use are constantly evolving. There is an urgent need for a wider discussion on how we will resource future generations in a socially sustainable way and without disadvantaging future generations.

- How do we as individuals value the discovery, extraction, use and disposal of resources?
- What are the implications of the uneven geographical distribution of both resources on local, regional and national communities?
- What ethical dilemmas play a role in the development of future resources?

Acknowledgment

We would like to thank JIPDC (Juju Province Development Co.) for contributing 100,000 USD to support IGCP projects and UNESCO Global Oceans Parks between 2018 and 2022. We also thank the UNESCO Office, Jakarta for sponsoring to participate the workshop “Open Science for Networked Societies.”
**Introduction**

In 2008, the International Research Center on Karst under the auspices of UNESCO (hereinafter IRCK) was formally established in Guilin, China. It is also the first category II center concerning geosciences. 15 international cooperation agreements have been signed with 11 countries or international organizations. 10 international training courses have been held by IRCK, and more than 200 trainees from all continents have got the training on karst geology. In 2013, IRCK successfully passed the first six-year evaluation by the Experts Panel of UNESCO, who agreed that IRCK was an efficient category II center under UNESCO. In 2016, the Renewed Agreement of IRCK was signed, indicating the formal operation of phase II of IRCK.

**Activities**

Carbonate rock distributes widely around the world, with an area of 22,000,000km² which occupies 15% of the land area. Therefore karst system plays an important role in the surface system of the Earth.

IRCK is conducting IGCP661, as the 6th IGCP related to karst from 1990 continuous, and amount of achievements have been got during the cooperation of scientists in China and overseas that sponsored by UNESCO and IUGS. IRCK is positive to attend the events of MAB, also jointly published an special issue with Chinese MAB committee. 2 personals of IRCK have taken the position of chair and vicechair of IAH Commission on Karst Hydrogeology.

**GLOBAL KARST:**
Since the implementation from 2016, Resources and Environmental Effects of Global Karst Dynamics Systems International Big Scientific Plan (Global Karst) has attracted the attention from karst geologists and government.

**Technology roadmap of GLOBAL KARST**

1. **Karst ecosystem and rocky desertification.** Detected the rules of water and soil interaction, and established scientific models to develop proper economic plants to improve the environment and increase the income of poor people.
2. **Carbon cycle and global change.** Estimated the huge quantity of geological carbon sequestration, especially in karst areas. Illustrated the paleo climate and environment by the spelechemistry and isotope methodology, to direct the research of global change nowadays.
3. **Geological landscapes and geopark.** Depend on sufficient experience on geomorphology, landscape exploration and conservation, IRCK has successfully assisted 8 UNESCO global geoparks and 11 World Natural Heritage application.

**Conclusion**

IRCK will insist Global Karst with international partners, and get the direct with UNESCO, IUGS and Chinese government. ISO/TC 319 strengthens this international platform and provides a strong and normative support to Global Karst implementation.

**Acknowledgment**

Thanks to the strong support from Chinese government, international organization and scientists to GLOBAL KARST, like Ministry of Natural Resources, UNESCO Office Beijing, International Union of Geological Sciences, ISO/TC 319.
Roads and landslides in Nepal

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UINSPIRE Nepal

Organization Introduction

Himalayan Risk Research Institute (HRI) is an interdisciplinary research-based organization of young scientists and professionals in Science, Engineering, Technology and Innovation (SETI) for Disaster Risk Reduction (DRR) research, humanitarian actions and voluntary social works. HRI is a platform to develop and carry out independent as well as collaborative (national and international) research projects, social activities and movements. At HRI, as an interdisciplinary resource base, we work at the nexus of scientific outcomes and implementing scientific knowledge at grass-root communities. HRI is now associated with UINSPIRE Nepal.

Activities

We conduct scientific research related to natural hazards and disaster risk reduction in accordance with the sustainable development goals.

In-line with IH-P, our activities are also focused on water related disasters. We investigate various dimensions of rainfall triggered landslides and flood hazards in Nepal. We promote youth and young professionals’ mobilization in SETI for DRR through the UINSPIRE platform.

Some of our activities are outlined here:

1. UN INSPIRE Nepal Inception: Youth mobilization in Science, Engineering, Technology and Innovation for DRR
2. Transport network disaster resilience (Case: Sindhupalchowk, 2015)
3. Transboundary research: Landslides susceptibility along China-Nepal highway
4. Flood disaster response study (Case: Gaur municipality, 2017)
5. Disaster related fieldworks (Case: Gorkha earthquake 2015)

Case study: Roads and landslides in Nepal: How development affects environmental risk?

What’s the status of sustainable development policy of the government in rural areas of Nepal- where there is an immediate need of road access? Why and how much are we compromising nature conservation? In this study, we determine the effect of informal roads on generating landslides by comparing the random distance between roads and landslides in Sindhupalchowk district of Nepal.

In (b) and (c), landslides are triggered on these informally engineered road networks. The rainfall-triggered landslides are more than twice as likely to occur within 100 m of a road than the landslides generated by the earthquake.

Conclusion

There are likely to be twice as many monsoon-generated landslides in terrain with poorly constructed roads as would be present without roads.

Although foreign investment aids construction, maintenance costs fall on impoverished communities who must decide between access and basic services.

Economically feasible and environmentally sound adaptations can reduce losses in resources and lives.

Acknowledgment

This work is supported by Yale-NUS college grant and Himalayan Risk Research Institute. This work is recently published in the NHESS Journal.
The Water Availability in Indonesia Karst Region

Hidayat Pawitan\textsuperscript{1} and Yopi Ilhamyiah\textsuperscript{2}

\textsuperscript{1}Laboratory of Hydrometeorology, Dept. of Geophysics and Meteorology, Faculty of Mathematics and Natural Sciences, IPB University, Bogor \textsuperscript{1}Laboratory of Marine Meteorology, Dept. of Marine Science, Faculty of Marine Science and Fisheries, Syiah Kuala University, Banda Aceh

\textbf{Introduction}

\begin{itemize}
  \item \textbf{Our Laboratories at IPB and Syiah Kuala Universities}
  \begin{itemize}
    \item Laboratory of Hydrometeorology
    \item Laboratory of Marine Meteorology
    \item Cooperation
    \item Numerical weather prediction, Air-Sea interaction, Fishing ground
    \item Hydrology
    \item Preservation of water resources
    \item Public weather climate, and ocean service
    \item Center for Climate Initiative
    \item Human Welfare
  \end{itemize}

\item \textbf{Activities}

\begin{itemize}
  \item Indonesia National Committee – UNESCO International Hydrological Program
  \item ERCE-UNESCO, Lodz-Poland 2011; APCE-UNESCO
  \item UNESCO-IHP RSC-SEAP Awardee 2015

  \item UNESCO-ICTP Third Workshop on Water Resources in Developing Countries Planning and Management in Face of Hydroclimatical Extremes and Variability, Trieste-Italy, April 27-May 3, 2015
  \item UNESCO-ICTP RegCM Training Workshop for Southeast Asia, Manila-The Philippines, May 25-29, 2015
  \item UNESCO-ODC Training Course on Ocean Dynamics and Multi-scales Interaction, Qingdao-China, September 5-16, 2016
  \item UNESCO-ODC Training Course on Development of Coupled Regional Ocean Models, Qingdao-China, June 12-23, 2017
  \item UNESCO-ICTP Second Training Workshop on Regional Climate Modeling for Southeast Asia, Hanoi-Vietnam, October 22-26, 2018

  \item Dr. Yopi Ilhamyiah

  \item The writer of The Jakarta Post, The Conversation, Detik.com, Konan Jakarta, Local newspapers

\end{itemize}

\begin{itemize}
  \item \textbf{Indonesia karst region:}
    \begin{itemize}
      \item Representing 20\% of total Indonesia, i.e., Bukit Barisan Sumatera, Java Island, eastern islands in Nusa Tenggara, Sulawesi and Papua
      \item Gunung Sewu Karst in Yogyakarta and Maros Karst in South Sulawesi are typical Tropical Karst
      \item Contrary to the land surface conditions as water crisis region, actually there are substantial subsurface water storages, including existence of underground rivers
    \end{itemize}

  \item \textbf{Framework of water availability in karst region}

  \item \textbf{Citatah West Java 10320 ha}

  \item \textbf{Maros 42750 ha}

  \begin{itemize}
    \item 2014
    \item Parameters
    \item Gunung Sewu
    \item Values
    \begin{itemize}
      \item Karst areas (ha)
      \item Coefficient runoff
      \item Surplus (mm)
      \item Water availability (million liter/year/km\textsuperscript{2})
      \item Water demand (million liter/year/km\textsuperscript{2})
      \item Water Utility Index (%)

      \begin{itemize}
        \item 148,536
        \item 0.25
        \item 817
        \item 1230 x 10\textsuperscript{6}
        \item 182 x 10\textsuperscript{6}
        \item 15
      \end{itemize}
    \end{itemize}

    \item \textbf{Conclusion}

    Despite strong impression as dry areas lacking water for daily needs, Indonesia karst regions provide substantial water resources underground.

    \textbf{Acknowledgment}

    UNESCO Jakarta, Ministry of Research, Technology, and Higher Education; Students of Dept. of Geophysics and Meteorology IPB
Creating Ecosystem of Responsible Waste Management in Indonesia

Waste4Change

Introduction

Indonesia’s waste problem seem to be never-ending. We see waste everywhere - on our streets, in our rivers, and to our oceans. It is estimated for this year, over 69 million tons of solid waste is generated in Indonesia annually. From this number, the majority (69%) are being landfilled, while 0.48 – 1.29 MMT/year of it are polluting our oceans, ranking Indonesia as the second biggest plastic waste contributor to marine debris.

Waste management is undoubtedly a complex issue in Indonesia. As a developing country, we often do not think far ahead into what we produce, and what ends up in the life cycle. The role of each stakeholder can have a significant impact to the society, economy and ultimately, environment.

Therefore, Waste4Change was created as a social enterprise that provides services in waste management with an environmentally friendly and responsible approach. Our work strives towards implementing Circular Economy in Indonesia.

Case study and Results/Achievements

Achievements

By 1st Quarter of 2019, we have done 28 researches, 24 program assistance in communities, 51 campaign projects, throughout Indonesia. We also collect and recycle solid waste from 46 clients including embassies, private and public sectors.

Campaign

Waste4Change created an interactive educational tour to raise awareness of responsible waste management among stakeholders. We conduct waste management study in 7 Indonesia’s borderlines to evaluate current waste management system and shape technical instruction in planning, arranging, controlling & monitoring of improved solid waste management.

Consult

We collect segregated waste from clients offices/building and convert collected waste into recycled materials and compost. Clients: IKEA, Uniliver, Ministry of Maritime, Dutch Embassy & many more.

Activities

Waste4Change is providing end-to-end solution for waste management and working on 4 core businesses which are:

Consult: Give consultation based on in-depth research and conduct program assistance and training to communities in order to achieve responsible solid waste management

Campaign: Through various education programs, we aim to increase people awareness of responsible solid waste management and circular economy.

Collect: Provide responsible solid waste collection services to commercial and private sectors in ethical way so no more waste is mixed

Create: Collaborating with our recycling partner to transform collected waste into recycled material.

Our main goal is to achieve SDGs 12: Responsible Consumption and Production and we believe it impacts on other SDGs such as SDGs 8 Decent Work and Economic Growth, SDGs 11 Sustainable Cities and Communities, SDGs 13 Climate Action, SDGs 14 Life Below Water, SDGs 17 Partnerships for the Goals.

Conclusion

Our vision is to become the leader in providing ethical and responsible waste management solutions towards a better Indonesia and we believe collaboration is the most important part to create more massive and sustainable impacts.

Acknowledgment

We say thank you for our clients and shareholders who believe in us on sharing visions towards better solid waste management in Indonesia.
Regional Flood Forecasting Model for Sindh
Shoab Ahmed, NED University of Engineering & Technology, Karachi

Introduction
For Pakistan, there are two major causes of floods: rain floods due to intense rainfall and overflowing of rivers and streams due to intense rains or glacial melt. The average rainfall of Pakistan ranges from 125mm in South-East (Figure 1) region to 750mm in the North-West region. Pakistan has one of the largest irrigation systems in the world, and her Gross Domestic Product (GDP) index and export is significantly controlled by agricultural production, therefore it is essential to protect the cultivated areas and human lives from floods. Pakistan has witnessed multiple catastrophic floods that originated in the River Indus systems. The recent two floods in 2016 and 2017 had been an eye-opener to better planning and management of water resources. The 2010 flood was recognized by the United Nations as the greatest natural disaster in its history, affecting twenty million people. One-fifth of Pakistan was submerged during that flood. The inevitability for establishing an early flood forecasting and warning system has thus been recognized. The assessment and mitigation strategies for flooding needs to be executed at provincial levels since flood impacts have spatial variation throughout the timeframe of flooding events.

Objectives/Activities
The primary objective of this study is to develop a flood forecasting early warning system for Sindh. The specific objectives of this study are:
1) Modeling runoff and flow from upstream
2) Forecasting the lead time i.e., the time of flood to occur, and hydrograph for flood wave at outlet
3) Forecasting depth and extent of flood
4) Developing a flood database and a flood broadcasting mechanism.

Enabling the community for preparedness, these technical objectives target Sustainable Cities and Communities (SDG 11) & Climate Action (SDG 13). The model used for simulation and forecasting is PC Storm Water Management Model (PCSWMM) (Figure 2). Data have been prepared on Geographic Information System (GIS) for each of the model based on their input requirements (Figures 3, 4). For better visualization and understanding, 2D modeling has been used for this study. The method involved setting up 1D Model then importing hydraulic infrastructure, setting inflow boundary conditions and river cross-sections and hydraulic parameter. Calibration and validation of the model was done on the flood extent and depth maps of flood 2018. Moreover, lead time of flood was also forecasted.

Results & Discussions
Validation results for PCSWMM showed NS-efficiency and R² as 0.85 and 0.79, respectively (Figure 4), that justify the performance of the model. The difference in flood extent (Figure 5) is not more than 18%, making the results sound and acceptable. The observed data showed 7 days and simulations also show that within 7 days the lead time was achieved (Figure 6). Furthermore, for depth parameter, Larkana and Sajawal areas show close values of depth since the difference between observed and simulated values is not more than 0.4m (Figure 7).

Conclusion
• PCSWMM model successfully performed flood inundation analysis using the input data for 1D as well 2D modeling. The appreciable statistical results show strong evidence of the performed simulation of flow.
• An extensive Geographical Information System Database consisting all utilizing datasets is created. This data can be updated accordingly for future studies.
Strategic Strengthening of Flood Warning and Management Capacity of Pakistan

Prof. S. Khan, Dr. A. Sugiura, Mr. R. Shah, Dr. A. Younas, Mr. J. Naseem (UNESCO)

Introduction

Pakistan faced floods and perturbing rains during consecutive monsoons from 2010 to 2015. In order to reduce the human and socioeconomic impacts of flooding in Pakistan a project "Strategic strengthening of flood warning and management capacity of Pakistan" assisted by Government of Japan was launched in 2011; first phase of the project was completed in 2014, and second phase was completed in April 2019. Primary objective of this project was reducing human and socio-economic impacts of floods in Pakistan as described in SDG target 1.5 and SDG target 3.1, to improve the social economic and ecological benefits of floods as in SDG 6.6 and SDG 9.1, and to foster safer human settlements near flood plains as described in SDG 11.1 and 11.2.

Activities

- Up-gradation and improvement of Indus Integrated Flood Analysis System/Rainfall Run-off Inundation (Indus-IFAS/RRI) system covering the whole Indus River catchment including the Eastern rivers (Jhelum, Chenab, Ravi and Sutlej) in Pakistan
- Strategic strengthening of ground observation network to meet the WMO standard and increase the density of the observation network with installation of at least 34 Automated Weather Stations (AWS).
  URL: http://faws.pmd.gov.pk/
- Significantly increase the number of the advanced experts (Master’s degree level) who can fully operate and handle the IFAS/RRI model
- More than 40 water experts from neighboring countries are so far trained on flood management including flood forecast, warning and hazard mapping to enhance technical cooperation with the South Asia region for its stability
- Soil characterization survey of Indus River catchment are conducted
- Through the several training workshops on flood forecast, warning and hazard mapping techniques for flood related agencies in Pakistan more than 800 experts are trained to enhance & improve coordination of flood management approach among these agencies in Pakistan

- Indus-IFAS is the first hydrological model to cover upper Indus catchment and it has enabled PMD to forecast floods about 24 hours earlier for the study area.
- For the first time in Pakistan, a soil characterization study was conducted in the upper Indus catchment; soil texture, infiltration, hydraulic conductivity (saturated and unsaturated), and resistivity data was collected for 377 sites.
- A Rainfall-Runoff-Inundation model has been established in the Lower Indus region to support the analysis of the link between the spatial extent of the flood hazards and flow predictions by the Indus-IFAS model.
- As a part of human resource capacity development program of the project, 12 government officers were sent to ICHARM for the Master degree in Disaster Management.
- Seven international trainings were organized in Pakistan, during this project. In these trainings international experts came from all over the world and shared their knowledge and experience in the areas of flood forecasting and mitigation. More than 800 mid-level managers from various flood management related government organizations were trained by local and international experts.
- Community trainings were organized to enhance their understanding about water related hazards and their vulnerabilities. Communities were trained on watershed management practices like rainwater harvesting through rooftop, micro catchments, in-situ moisture conservation measures through on-farm soilwater control structures, gypsum application for moisture conservation, green manuring and on-farm composting.

Conclusion

Flood early warning and flood forecasting information obtained through these hydrological models would be instrumental in flood management and decision support system for mitigation and relief activities. Flood inundation and hazard maps visualization tools have been developed at the district level which will used to disseminate flood related information to the District Coordination Officers to properly use the flood management assistance provided by the government agencies, UN organizations, and local and international NGOs. During this project a number of trainings were organized, where international experts were invited through UNESCO network to share their knowledge and experience with the top and middle management staff of flood management organizations in Pakistan.

Acknowledgment
Laying the Foundation for Youth and Young Professionals in Disaster Risk Reduction and Climate Change Adaptation for Sustainable Development – The Role of SEADPRI-UKM

Mohd Khairul Zain Ismail, Joy Jacqueline Pereira, Sarah Aziz Abdul Ghani Azis, Lim Choon-Sian, Tan Ling Ling & Nur Fashareena Muhammad
Southeast Asia Disaster Prevention Research Initiative, Universiti Kebangsaan Malaysia (SEADPRI-UKM)

Introduction

Universiti Kebangsaan Malaysia’s Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM) has been in operation since June 2008. Based at the Institute for Environment and Development (LESTARI), the Centre addresses crucial challenges on disaster risk reduction in Malaysia and the region. The research focus is on climatic hazards, geological hazards and technological hazards, with emphasis on capacity building, mainly through post-graduate programmes and specialised training. Transdisciplinary research conducted by the Centre is action-oriented, bridges the science-governance interface and provides pathways for disaster prevention. In 2016, SEADPRI-UKM was acknowledged by the Integrated Research on Disaster Risk Programme (IRDR), jointly sponsored by International Science Council (ISC) and the United Nations Office for Disaster Risk Reduction (UNDRR), as an IRDR International Centre of Excellence (ICOE) for Disaster Risk and Climate Extremes (ICOE-SEADPRI-UKM). Globally, SEADPRI-UKM now sits with a group of 16 institutions with such recognition, representing various regions. The focus of ICOE-SEADPRI-UKM is to strengthen local inputs for addressing regional disaster risks in conjunction with national and international partners. A major flagship is the Asian Network on Climate Science and Technology (ANCST), coordinated by SEADPRI-UKM and funded by the Cambridge Malaysian Education and Development Trust, to link disaster risk reduction and climate change for building resilience in the region.

Achievements

SEADPRI-UKM organises about six capacity building events annually with various partners. Over 20 major projects have been implemented with multi-national research consortiums operating primarily in ASEAN. Major platforms have been established to enhance communication between scientists and early career researchers and young scientists working in the region. The Asian Network on Climate Science and Technology (ANCST), which comprises self-organised special topic groups on climate science of importance to Asia was established in 2013 [www.ancst.org]. The ASEAN Partner Institutions on Climate Change Adaptation (ASEANadapt), recognised by the ASEAN Working Group on Climate Change (AWGCC) in 2016 [www.aseanadapt.org], facilitates continuous exchange of information on good practices for climate change adaptation and building disaster resilience among universities and other affiliated organisations in ASEAN Member States. The Malaysia Window to Cambridge at UKM (MW2C@UKM), served as a gateway to Cambridge for scientists from Malaysia and Asia. It was launched in 2017, to facilitate training of early career researchers and young scientists in Asia, focuses on capacity building in atmospheric science and climate change.

Activities

A major research focus of SEADPRI-UKM is to explicitly link disaster risk reduction and climate change to achieve the goals of sustainable development. The ongoing project on ‘Integrating Disaster Risk Reduction, Climate Change Adaptation and Loss and Damage’ identifies areas and communities that are exposed to both fast and slow-onset hazards due to climate change at the local level in several ASEAN countries. The Project of “Newton-Ungku Omar on Disaster Resilience Cities of Kuala Lumpur” is a pilot initiative to develop the first ever multi-hazard platform on forecasting system at the city level for the tropics. The pilot is expected to promote coherence with integrating risk reduction, adaptation and mitigation within development actions in cities. SEADPRI-UKM also instrumental in formulating the National Science, Technology and Innovation Plan for Disaster Risk Reduction, which intends to facilitate systematic advancement of science and technology to address knowledge gaps in current and emerging hazards, particularly with respect to disaster risk reduction and its linkages to climate change and sustainable development. The establishment of ‘Special Topic Group for Youths, Disaster and Climate Change’ under the aegis of ANCST will provide a catalyst for youth and young professionals’ involvement in science-policy interface for DRR and climate change.

Conclusions

The experience of SEADPRI-UKM indicates that two-way engagement with youth and young professionals and other relevant stakeholders in local and regional area settings expedites the delivery of science-based solutions to promote policy coherence. University alliances and young scientists networks are important for capacity building in DRR, to enable and empower the science-policy interface in addressing the challenges of disaster risks, climate change and sustainable development for a transformed region.

Acknowledgment

Asia-Pacific Network for Global Change Research, Institute of Global Environmental Studies, Japan, Newton-Ungku Omar Fund, Cambridge Malaysia Education Development Trust, Malaysia Meteorological Department, Mineral and Geoscience Department Malaysia, Department of Environment Malaysia, University of Malaya and all other partners of ICOE-SEADPRI-UKM.
Permaculture Garden in School:
National Curriculum for Primary Schools in Timor-Leste
University of Chinese Academy of Sciences:

A university to promote cultivation of talent through scientific research

University of Chinese Academy of Sciences (UCAS), formerly named Graduate School of CAS, was the first graduate school in China. In 2014, UCAS started enrolling undergraduate students, and since then an intact higher educational system has been established.

Being the largest graduate education institution in China, UCAS has over 60,000 ongoing students, and half of them are doctoral students. There are more than 1,800 international students from 103 countries, including 1,050 doctoral students, ranking first in China.

With strong support from CAS institutes all over China, UCAS espouses the philosophy of "The Fusion of Scientific Research and Teaching" as its basic system of education. The disciplines represented at UCAS include all fields of science and 90% engineering.

According to the Global University Ranking by Essential Science Indicators (ESI) in July 2019, UCAS ranked No. 1 in China and No. 86 worldwide. Furthermore, the 2018 Nature Index Institution Ranking placed UCAS No. 24 worldwide.

UCAS highly values its partnership with world-class institutions. As a member of the Association of Pacific Rim Universities (APRU), UCAS has established close ties with over 100 world-renowned universities. In collaboration with UNESCO and the International Center for Theoretical Physics (ICTP), UCAS is constructing the International Center for Theoretical Physics Asia-Pacific (ICTP-AP) on campus. To help promote education in B&R countries, UCAS has been involved in international projects, including CAS-TWAS fellowship and the CAS "The Belt and Road" Master fellowship program. Based on CAS overseas joint research centers, UCAS is building overseas joint centers for education and research to promote capacity building on B&R.

Please find more information at https://english.ucas.ac.cn/
Karezes of Balochistan - A Sustainable solution to water

Ms. V. Jensen, Mr. R. Shahe, Mr. J. Atiz (UNESCO), Dr. M. Asraf, Mr. F. Hasan, Ms. B. Fatimah (PCWR)

Introduction

Balochistan Province of Pakistan lies in the arid climatic region where rainfall is very low and its spatial and temporal variability is very high. Lift irrigation, springs and Karezes are the main sources of water for agriculture and domestic uses. The Karez-irrigation system is the peculiar and oldest gravity irrigation systems which was built centuries ago. It provides safe and free (gravity based) water supply for both irrigation and domestic uses, round the clock and throughout the year. The evaporation losses are minimal and its underground coverage protects against sediments from wind storms. A Karez is a masterwork of hydraulic engineering and cultural unity. It is an underground horizontal tunnel dug below groundwater level to intercept water. These are normally 1-5 km long, though some are as long as 50 km.

The Karez system faced great challenges over the last few decades such as drying up, abandonment and damage. These are mainly due to: (i) installation of shallow tubewells in the active recharge zones of the Karezes, (ii) indiscriminate irrigation of deep tubewells and groundwater pumping, (iii) the construction of reservoirs upstream, (iv) deforestation and (v) other human and natural activities. Due to flat rate of electricity and indiscriminate pumping, in some areas, the water table is declining at a rate of more than 5 m/year resulting into drying up of many Karezes. There is a need to revive this centuries old practice for sustainable livelihoods of the communities residing in Balochistan.

Activities

Under the framework of UNESCO Regular Programme, UNESCO Islamabad Office in partnership with PCWR and collaboration of ECO Science Foundation and UNESCO Tehran Cluster Office, started an activity on Karezes of Balochistan. Overall objective of this activity is to create conducive environment so karez water system will be revived. For this PCWR has accomplished a task of rehabilitating a dried karez. Now with the support of UNESCO Islamabad office, PCWR is developing GIS based digital inventory of Karezes, where all the data will be available on IHWIN. This database will provide ready to use information to decision/policy makers at provincial and federal level. Moreover, dossier development has been started for possible nomination of Karezes of Balochistan as Cultural Landscape to be enlisted in UNESCO World Heritage List. In this regard, a stakeholders’ workshop and steering committee meeting has been organized in July 2019. It has been anticipated that the world heritage nomination process will motivate the local communities in reviving and sustaining their karezes. UTG and ECOSF is supporting the exchange of experts from Pakistan and Iran to share expertise and experiences as Iran’s Karezes (Qanats) are already enlisted in World Heritage List.

Conclusion

Provincial Government of Balochistan and local communities will be benefitted by this activity. The activity will raise awareness and motivate the locals in reviving their centuries old practice. If enlisted in World Heritage list, tourism will increase that will improve the socio-economic conditions as well as livelihood.

Acknowledgment

Pre and post rehabilitation day light point of a karez, this activity has increased water availability in Karez, reducing their reliance on expensive tube well operations, Hana Karez, Quetta, Pakistan
Regional Workshop on Strengthening, Empowering, and Mobilizing Youth and Young Professionals in Science, Engineering, Technology and Innovation (SETI) for Disaster Risk Reduction (DRR) in Asia and the Pacific

Fajar Shidiq and Dr. Rahma Hanifa (U-INSPIRE)

Introduction

U-INSPIRE is a youth and young professional platform in Science, Engineering, Technology and Innovation (SETI) to accelerate the implementation of Disaster Risk Reduction (DRR) in line with the Sendai Framework to support DRR policy and action at local, national and international level. Our vision is fostering Indonesian youth and young professionals as the generator of innovation in science, engineering, and technology for disaster resilience at local, national, and global level.

Activities

Related to MAB or IHP or other UNESCO program/relevance and link with SDGs

This activity correlates with the vision of UNESCO science family which is to enable and empower Asia and the Pacific region in delivering science-based policy coherent systems solutions for SDGs 11, 17, 4, 8, and 9. SFDRR Priority No 3 and 6, and the Paris Agreement on climate change for a transformed region.

Case study and achievements

This workshop was conducted in addressing some of the youth and young professionals’ challenges and potentials in contributing to DRR. The challenges include, inter alia, limited opportunities and platform for young independent researchers to develop and contribute in SETI for DRR. They also have limited or no platform to have transdisciplinary interaction and communication; meanwhile, they live in a technologically savvy world. The objectives of this workshop were (1) to build understanding among youth and professionals on their role in SETI for DRR as well as various important topics to leverage their roles, (2) to develop joint activities to support the implementation of SFDRR; and (3) to share lessons learned from the establishment of U-inspire Indonesia.

This workshop involved 98 people from 32 countries in Asia and the Pacific, Africa, Europe, and America with the background vary from natural scientists, engineers, social scientists, science communication, and innovators; working in multiple sectors. The workshop was carried out in five consecutive days, consisted of five panel sessions on (1) Mainstreaming DRR in Higher Education, (2) Global Settings, Platforms, and Networks on Youth and Young Professionals in DRR, (3) Youth and Young professionals in SETI for DRR Challenges, Gaps, Needs, Expectations, and Initiatives, (4) Introduction to Integrated and Transdisciplinary Research in DRR, and (5) Introduction to Science Communication for DRR. Besides panel session, an about (1) S&T Roadmap for SFDRR, (2) Young Scientist Roadmap, and (3) U-inspire as a national platform for youth and young professionals in SETI for DRR. Those sessions were followed by introductory session, breakout sessions, sharing session regarding initiatives and challenges of youth and young professionals in contributing through SETI for DRR in their respective countries. The event was also complemented with a field trip to The Agency for the Assessment and Application of Technology (BPPT) to learn the recent 2018 Sulawesi Earthquake and Tsunami, and observation of various Early Warning System (EWS).

Conclusion

The conclusions from the workshop were youth, and young professionals agreed to have a stronger collaboration to bridge the missing link and to advocate their needs in Asia and the Pacific and globally. They also recognized the need to have a similar platform and would like to replicate U-INSPIRE in their countries to voice their aspiration. Currently, U-INSPIRE Pakistan, the Philippines, and India have been established. Similar efforts are also being initiative in Malawi, while the launching of U-INSPIRE Malaysia is scheduled in October 2019. On May 2019, U-INSPIRE also participated in the GPDRR to share the results from the workshop and the establishment of U-INSPIRE in several countries. Several events and workshops were also conducted in the participants’ respective countries as the follow up activities after the workshop. In December 2019, the second regional workshop is planned to be held in Chengdu, China, by the support of IDMR - Sichuan University.

Acknowledgment

[Logos of various partners]
From Earthquake Science to Building Earthquake Community Resilience

Fajar Shidiq and Dr. Rahma Hanifa (U-INSPIRE)

Introduction
Center for Earthquake Science and Technology (CEST), Research Center for Disaster Mitigation, Institut Teknologi Bandung, is a research center with vision to become a Science and Technology Center of Excellence that produces discoveries and innovations in the development of superior and respected seismic science and technology at the national level, is internationally recognized and contributes significantly in the context of creating conditions for Indonesians that are safer from the threat of disasters, especially earthquake disasters.

U-INSPIRE is a youth and young professional platform in Science, Engineering, Technology and Innovation (SET) to accelerate the implementation of Disaster Risk Reduction (DRR) in-line with the Sendai Framework to support DRR policy and action at local, national, and international level. Our vision is fostering Indonesian youth and young professionals as the generator of innovation in science, engineering, and technology for disaster resilience at local, national, and global level.

Activities
Related to MAB or IHP or other UNESCO program/relevance and link with SDGs
This activity correlates with the vision of UNESCO science family which is to enable and empower Asia and the Pacific region in delivering science-based policy coherent systems solutions for SDGs 11, 17, 4, 8, and 9, SFDRR Priority No 1 and 4, and the 7 target of SFDRR.

Experts within CEST plays important role within the National Center for Earthquake Studies (PusGeN) producing scientific-based map and book on the updating of the National Earthquake Source and Hazard Map 2017, as well publishing books on the assessment of recent significant earthquakes in Indonesia. The result is then used as a basis to build disaster resilient community.

Case study and achievements
Infographic of FAQ, case for Lombok Earthquake and Anak Krakatau Tsunami 2018
The result published scientifically by earthquake experts is then goes through a process of science communication by U-INSPIRE in creating an infographic version based on 10 most Frequently Asked Questions by the community.

Building Disaster Resilient Community
The science-based earthquake hazard and risk information is used as a basis in building disaster resilient community. 2 cases are presented:

a. ASEAN Youth Volunteer Program (AYVP) 2017 with theme Disaster Resilience Building, in collaboration between ITB with Universiti Kebangsaan Malaysia (The National University of Malaysia - UKM) with the advice and support of the Ministry of Youth and Sports Malaysia (KBS), ASEAN Secretariat (ASEC), and the U.S. Agency for International Development (USAID). Bandung specifically is prone to flood, landslide, volcano and earthquake hazard. Located just near to Lembang Fault, the main focus is to build disaster resilience to earthquake hazard. Earthquake hazard is a threat to all Asia countries, with highest risk in human loss, damage and economic loss. AYVP mobilize 50 Youths across ASEAN with 10 facilitators from Indonesia. Lembang Village, which was the targeted village during AYVP maintain the value obtain through AYVP by establishing village programs on DRR. Several DRR Youth Leaders from AYVP 2017 then establish Uinsure Indonesia and soon will launch Uinsure Malaysia on 15 October 2019.

b. The Tsunami Disaster Resilient Village Expedition by BPPE (EDT 2019) from East to Western Java from 12 July to 17 August 2019, was a response from the NDMO to build community resilience toward Megathrust Earthquake and its tsunami potential as scientifically proven by earthquake and tsunami experts including CEST and author's publication (Hanifa et al, 2014). Uinsure plays role during the expedition in communication science to the community, villagers and schools.

Conclusion
Strong collaboration between scientist, stakeholders and community is needed to bridge the missing link and to advocate science based research into action to building disaster resilience from local level to national and regional level. Youth, Young Scientist and Young Professional plays important role as catalyst and generator to provide more science and DRR actions. FAQ infographic on Flash Flood and Palu 2018 earthquake is currently ongoing, and more FAQ will be produce to bridge science communication from scientist to community. Next program on Youth and Young Professionals engagement in bringing earthquake science to building disaster community is being plan and seeking for collaborators.
International Center for Chemical and Biological Sciences (ICCBS)

Prof. Dr. M. Iqbal Choudhary, H.I., S.I., T.I. and Hina Siddiqui
H. E. J. Research Institute of Chemistry, Dr. Panjwani Center for Molecular Medicine and Drug Research (International Center for Chemical and Biological Sciences) University of Karachi, Karachi-75270, www.iccbs.edu

Introduction

Located in Pakistan’s financial centre and largest city, Karachi University’s International Center for Chemical and Biological Sciences (ICCBS) is one of the developing world’s finest research and training centres in its field. The large complex, which covers more than 40 hectares, is comprised of 17 research buildings that contain some of the region’s most sophisticated laboratory equipments. The complex also includes a residential area with 50 houses, five apartment buildings and an international guesthouse. ICCBS carries out research, training, product development and service delivery in the chemical, biological and biomedical sciences. The centre also provides diagnostic, analytical and clinical testing for a broad range of clients in both the public and private sectors. Over the past 50 years, more than 1,300 students have earned doctorate and master’s degrees at the centre. These degree-granting programmes have served as the focal points of ICCBS efforts to provide world-class training to young scientists coming primarily from developing countries, including those belonging to the Organization of Islamic Cooperation (OIC), an international network comprised of 57 Muslim countries. ICCBS also conducts cutting-edge research for the discovery of clinically important enzymes and antioxidants, explores innovative methodologies for the synthesis of novel proteins, develops effective pharmacological evaluations of bioactive compounds, and seeks to identify new varieties of horticultural plants through applications of biotechnology. ICCBS carries out cutting edge research in the field of structural biology and chemistry, nanotechnology, genomics, theoretical chemistry, systems biology, stem cell technology, polymer etc.

This center has won more international awards than any other institution in Pakistan. These international awards include the Islamic Development Bank Prize for the Best Science Institution (twice 2004 and 2010), World Health Organization Collaborating Centre (WHO), UNESCO Category II affiliation, Fellowship of the Royal Society of Pakistan International Prize, ECO and COMSTECH awards and UNESCO Science Prize. Center is recognized internationally by the UNESCO, OIC and, TWAS as their Center of Excellence.

Activities

1. Sustainable use of medicinal flora for the prevention of disease, and treatment of health disorders is the key theme of the ICCBS world-renowned research. The center has worked on several hundred medicinal plants of Pakistan, and other countries.
2. Our contributions to reverse bacterial resistance to antibiotics represent seminal contributions in this important field.
3. Faculty members of ICCBS has also discovered the two most potent antiparasitic natural products (soxivorones A and B), patented in USA, from a local medicinal plant Delphinium dem dumonin, which has attracted a major attention internationally and are currently in second phase clinical trial.
4. Faculty members of ICCBS conduct lot of research work in the area of ethnic and folk medicines, discovery of plant materials with pronounced anti-Pakistan, anti-leishmanial and cholesterol-lowering activities. These findings are at various stages of development.
5. Over 5000 scholars from developed and developing world have obtained advances research trainings in chemical and biochemical sciences at the international center for Chemical and Biological Sciences (ICCBS), University of Karachi. Students include from Germany, France, Turkey, USA, Cameroon, Nigeria, Kazakhstan, Sudan, Sri Lanka, Bangladesh, Nepal, Malaysia, Iran, China, Iraq, Cuba, Jordan, Palestine, Saudi Arabia, etc.
6. ICCBS has contributed in the establishment of Centers of Excellence in Kazakhstan, Sudan, Bangladesh, Sri Lanka, and many other countries.
7. SAARC, and TWAS-based activities, including exchange of scientists, and young researchers.
8. ICCBS has a strong women empowerment program for the young women researchers of Africa and Sub Saharan Africa.

Conclusion

International Center for Chemical and Biological Sciences (ICCBS), (H.E.J. Research Institute of Chemistry, and Dr. Panjwani Center for Molecular Medicine and Drug Research), University of Karachi is the world class research institution, fully engaged in training of young researchers from home and abroad in sustainable science. The research work at ICCBS is in line with the SDGs and its impact on Science and Technology, capacity development is internationally recognized.

The center is looking forward to expanding its research program in sustainability science, through its global network of scientists, and R & D organizations.

Acknowledgment

1. Husein Ebrahim Jamal Foundation, Pakistan
2. Dr. Panjwani Memorial Trust, Pakistan
Introduction
The History & Present of IRTCES

With the approval of the Chinese government and the 22nd session of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Research and Training Centre on Erosion and Sedimentation (IRTCES) was jointly established by the Chinese government and UNESCO in July 1984. The major functions and objectives of the Center are to:

1. promote scientific research on erosion and sedimentation (including sediment transport theory, fluvial/coastal and reservoir sedimentation, sedimentation engineering, soil erosion, soil and water conservation, environmental and ecological impacts of sedimentation);
2. provide technical advisory services and create a mechanism for the exchange of scientific and technical information on the results of research among experts in various countries;
3. host and coordinate the implementation of projects relevant to sediment, sustainable water management and water environment, as well as ecology;
4. coordinate international cooperative research activities and establish laboratory and research centers in order to provide facilities for laboratory and field work for the experts from other countries; and,
5. organize international training courses, symposia or workshops on special subjects, as well as international study tour and lecturing activities.

Activities
Activities related to IAP OR IHP or other UNESCO programme/
Relevance and link with SDGs

- Under the support of UNESCO and the direct leadership of the Ministry of Water Resources, PRC, the Center has been focusing on pioneering, innovating and developing in practice, and achieved fruitful outputs in various fields. Through conducting a large number of activities including domestic and international academic exchange, technical training, consulting research and information exchange, the Center has promoted scientific cooperation and knowledge sharing in the field of erosion and sedimentation, has disseminated and since its founding and under the support of UNESCO and the direct leadership of the Ministry of water resources, PRC, the Center has been focusing on pioneering and innovating exploring and developing in practice, and achieved fruitful outputs. It has also made great contributions to the advancement of global technology progress in the field of soil erosion and sedimentation. At present, the Center publishes the International Journal of Sediment Research (IJSR) and the FWSAP (Water, Sediment and Agriculture Journal), and serves the work of the two international academic organizations of the World Association for Sedimentation and Erosion Research (WASER). The World Association of Soil and Water Conservation and the Secretariat of the (UNESCO) International River Sediment Initiative (IIS), and organizes regularly the International Symposium on River Sedimentation (IIS), the International Conference on Erosion and Sedimentation Technology (INEP), and the IRTCES World Conference and the International Youth Forum on Soil and Water Conservation (WFSWC) and is responsible for the holding of the Biennial International Symposium on Erosion and Sedimentation Technology (INPES).

Until the approval of the Chinese government and the 22nd session of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Research and Training Centre on Erosion and Sedimentation (IRTCES) was jointly established by the Chinese government and UNESCO in July 1984. The major functions and objectives of the Center are to:

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3. host and coordinate the implementation of projects relevant to sediment, sustainable water management and water environment, as well as ecology;
4. coordinate international cooperative research activities and establish laboratory and research centers in order to provide facilities for laboratory and field work for the experts from other countries; and,
5. organize international training courses, symposia or workshops on special subjects, as well as international study tour and lecturing activities.

Conclusion
Conclusions and way forward: In the new period, the Center will actively play the role of leading and bridge links, expand research and consultation both at home and abroad, vigorously carry out the technology training of sediment and soil and water conservation, and strive to promote the development of the World’s sediment and soil and water conservation.

Acknowledgment
Ministry of Water Resources, P.R. of China, UNESCO, and other donors who have contributed to the development of the IRTCES/Advanced Workshop on Sediment/Soil and Water Erosion and Sedimentation (China, 2019) and for their support.

Science to Enable and Empower Asia Pacific for SDGs 2 (SEE AP for SDGs 2)
The Plastic Initiative
UNESCO

Introduction

The Plastic Initiative is UNESCO’s comprehensive approach to the plastic problem. UNESCO, with its World Network of Biosphere Reserves (BRs), as well as its capacities in the natural sciences, education and youth mobilization, is uniquely positioned to play a substantial role in reducing the problem, and it has a clear mandate. BRs are ideal places to systematically try and test existing and innovative ideas to clean up ecosystems and to keep them clean, with the involvement of government authorities, the private sector and young people. However, all places, including urban, rural and natural places can and should be sites for the implementation of future grassroots activities.

The Plastic Initiative contributes to the Sustainable Development Goals 1, 2, 3, 4, 5, 6, 11, 12, 13, 15, 16, 17, and above all to SDG 12, Responsible Consumption and Production, and 14, Life Below Water, which is mainly dedicated to coastal/marine ecosystems. We will turn to action and “Think globally, act locally”.

The initiative will include numerous grass-root level activities throughout the vast Asia/Pacific region, including the application of plastic-recycling machines, as it currently being prepared at UNESCO Bangkok.

Conclusion

There is no ‘easy fix’ to improve the situation. A comprehensive approach is needed, centered on UNESCO Biosphere Reserves combined with environmental education.

Acknowledgment

Sincere thanks are due to the Directors of the UNESCO Regional Offices in Bangkok and Jakarta, and numerous professional staff and interns at UNESCO Headquarters and in the Field, who assisted developing this initiative.
The Maritime Local Government Network (LGN) Promoting Conservation, Protection and Sustainability of Coastal and Marine Resources

Introduction

LGN is a network of local government leaders who are promoting the conservation, protection and sustainability of coastal and marine resources within the six Coral Triangle countries (Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor Leste).

LGN provides a platform for local governments to collectively discuss and collaboratively develop and strengthen projects, policies and action agendas that contribute to regional and local capacity for engaging coastal and marine ecosystems, and to improve the health of the Coral Triangle region.

The network was formed in 2011 as a result of the C4.5 Mayors’ Roundtable Meeting held in Wakatobi, Indonesia, and in response to the local governments’ interest to engage and contribute to the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF). In December 2018, LGN was granted legal status by the Ministry of Law and Human Rights of the Republic of Indonesia (Ministry of Law and Human Rights of the Republic of Indonesia, 2018).

Activities

On 17-19 June 2019, a regional workshop on ‘Building National and Local Capacity on Measuring SETI for SDGs in the Asia and the Pacific Region’ was held in Jakarta, Indonesia. It was a joint undertaking of UNESCO Office Jakarta (as the regional Science Bureau for Asia and the Pacific), the Coordinating Ministry for Maritime Affairs of the Republic of Indonesia and the Maritime Local Government Network (Maritime LGN) which aimed to encourage the achievement of SDGs targets through increasing national and local capacity for countries in the Asia Pacific, especially Coral Triangle Initiative (CTI) members. The Malaysia-UNESCO Cooperation Programme (MUCP) through the Facilitate in Accelerating Science and Technology in the region (AP-FAST) project supported the regional workshop.

Case study and achievements

Started with a regional meeting of local government leaders from the Coral Triangle countries (Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands, Timor Leste) in 2011, so called CTI Mayors’ Roundtable. The Maritime Local Government Network (Maritime LGN) was formed in response to the local governments’ interest to engage and contribute to the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF).

With the support of CTI-CFF, International Development Agencies and NGOs, LGN conducted country-level activities, regional exchanges and forums with the aim to encourage and support members to strengthen their policies and projects that protect and sustain the world’s richest marine biodiversity in the Coral Triangle region.

Hundreds of local government representatives have been advocating the critical role of local governments in marine conservation and protection for sustaining coastal and marine resources and raising awareness in their districts and provinces. Grow into an independent association connecting local government executives across the Coral Triangle region, LGN is now well positioned to align national goals, with regional goals from the “Coral Triangle Initiative” and the global “Sustainable Development Goals (SDGs)” and to take action on the protection and sustainable management of the coastal and marine ecosystems in the region.

Conclusion

As a new independent association, LGN continues to build ties with potential network members, develop strategic partnerships, and strengthen collaborations with current partners in order to implement planned activities and strengthen the capacity and performance of coastal and maritime local governments in conserving sustainable coastal and marine resources.

Acknowledgment

LGN’s STRATEGIC AND SUPPORTING PARTNERS:

Science to Enable and Empower Asia Pacific for SDGs 2 (SEE AP for SDGs 2)
The International center on Qanats and Historic Hydraulic Structures
Semsar Yazdi, Senior Advisor to UNESCO-ICQHS, semsar@icqhs.org

Introduction

A. UNESCO-ICQHS Establishment: After the proposal of Iran regarding the establishment of a center on Historic Hydraulic Structures and Qanats was approved by UNESCO's General Conference, in 2005 the agreement regarding the establishment of this center was signed between the Ministry of Energy on behalf of the government of the Islamic Republic of Iran and director general of UNESCO.

B. Mission: The main mission of the International Centre on Qanats and Historic Hydraulic Structures is an emphasis on recognition, transfer of knowledge and experiences, promotion of information and capacities with regard to all the aspects of Qanat technology and other historic hydraulic structures. This mission is to fulfill the sustainable development of water resources and the application of the outcome of the activities in order to preserve the historical and cultural values of these structures and inspire from them.

C. Venue: The center is based in the city of Yazd situated in the central plateau of Iran. This city is well-known for its Persian Qanats and Gardens as well as its historical district registered in the world heritage list. It is also famous for its desert, brick architecture, textile industry, ceramics, etc.

Implemented Activities:

In order to fulfill its mission, the center is focused on Research, training, technology transfer, scientific gathering, publication and cooperation with different countries, universities and organizations. The training courses of the center are categorized into two types: 1. Preplanned training courses which are held annually. 2. Tailor-made training courses which are designed according to the applicant's expectations. In this regard, the center has carried out different joint projects in countries like Algeria, Iraq, Azerbaijan, India, and Afghanistan.

Policies

The policies of the center in relevance to the objectives of this meeting are listed as follows:

- Promoting Traditional knowledge of Water Management and their lessons to present water challenges
- Establishing a task force on climate change adaptation at national level
- Studying and dissemination of the reasons behind the sustainability of HHS
- Documenting intangible heritage aspects of water
- Being inspired by tangible and intangible aspects of water relics
- Compiling the school and university texts regarding water traditional knowledge and water heritage and their message to climate change adaptation
- Supporting traditional practices in community participation
- Promoting the role of culture and society in Water resources management strategies
- Developing a Network in order to promote the synergy between researchers, practitioners, and experts to implement SDGs.

Suggestion

We suggest the Establishment of an (Asia Pacific For SDGs) Network which can be named as (UNESCO AP-Net). This web-based network will establish a link between all the UNESCO Chairs, centers and offices who are involved in different aspects of the outcomes of this meeting.

Given the Potentials of ICQHS, the center is ready to carry out joint educational and research projects in line with its objectives and contribute to the establishment of the mentioned web-based network.
NATURAL SCIENCES FOR SOUTH ASIA

Guy Broucke and Neha Midha
UNESCO New Delhi Cluster Office
for Bangladesh, Bhutan, India, Nepal, Maldives and Sri Lanka

UNESCO New Delhi Office

Natural Sciences Sector

- Strengthening science, technology and innovation (STI) systems and policies for sustainable development, poverty eradication, gender equality, and culture of peace and non-violence;

- Mobilizing science for the sustainable use of natural resources, renewable energy, water security, and for natural disaster reduction and mitigation.

Major Programmes

International Hydrological Programme

- Strategic Environmental Assessment for Scenario Based Water Management Strategies in New Delhi

- Spatio – Temporal Dynamics of Urban Wetland Landscape, Delhi

Disaster Risk Reduction

- Vulnerability Assessment for state of Kerala, India;
- Capacity building workshops for DRR planning;
- Guidelines for Prevention and Mitigation plans

Acknowledgments

Kerala Forest Department, India and UNESCO Heritage Emergency Fund
Regional Centre for Biotechnology
NCR-Biotech Science Cluster, Faridabad, Delhi NCR, India

An Institute of National Importance,
Established by Department of Biotechnology, Govt. of India
Under the auspices of UNESCO

RCB Vision and Mission
Regional Centre for Biotechnology (RCB) is an academic institution established by the Department of Biotechnology, Govt. of India with regional and global partnerships synergizing with the programmes of UNESCO as a Category II Centre. The primary focus of RCB is to provide world-class education, training and conduct innovative research at the interface of multiple disciplines to create high-quality human resource in disciplinary and interdisciplinary areas of biotechnology in a globally competitive research milieu. In 2010, RCB was recognized as an Institute of National Importance by the Parliament of India.

Academic Programmes
- Integrated MSc-PhD Programme in Biotechnology: Offered to students with graduate degree in any discipline of science, engineering or medicine with significant emphasis on laboratory training.
- Young Investigator Programme: A highly competitive award for meritorious PhDs to be mentored by the RCB faculty in the different areas being pursued.
- Multidisciplinary PhD Programme: Students with post-graduate degree (or equivalent) in any field of Science or technology can work under the mentorship of the faculty.
- Short Term Training Programme: Domain-specific programs designed to create a cadre of highly specialized scientists for high-end research and technology development.
- Hands on National Workshops: on several aspects of biotechnology and biomedicine, offering a combination of theoretical knowledge and hands-on experimental time in the appropriate area from experts in the field.
- Science Outreach: organize events such as Science day, open day, lectures in different schools and colleges by RCB faculty

Why Regional Focus?
- Promote cooperation for capacity building
- Develop knowledge rich, highly skilled human resource
- Facilitate harmonization of policies & procedures

International Networking
- DST-AIST International Laboratory for Advanced Bioimaging (DAILAB) set up in collaboration with National Institute of Advanced Science & Technology (AIST), Japan to facilitate joint collaborations engaging Indian and Japanese scientists
- Establishment of the Technology Advancement Unit (TAU), a joint initiative of the Swiss Agency for Development & Cooperation and DST with a focus on product development & technology transfer
- Acquisition and maintenance of synchrotron X-ray beam line in partnership with European Synchrotron Radiation Facility (ESRF)

RESEARCH AREAS
The programs of the Centre are designed to create opportunities for students to engage in multi-disciplinary research where they learn biotech science while integrating engineering, medicine and science, to provide solutions for human and animal health, agriculture and environmental technologies.

Contact Us:
Registrar
Regional Centre for Biotechnology
NCR Biotech Science Cluster
P.O. Box No. 3, Faridabad - 121 001 Haryana (NCR Delhi), India
E-mail: registrar@rcb.res.in; Phone: 91 129 2848800

Science to Enable and Empower Asia Pacific for SDGs 2 (SEE AP for SDGs 2)
**Introduction**

**Kyoto University**

“Since its foundation in 1897, Kyoto University has worked to cultivate academic freedom under a spirit of self-reliance and self-respect, and to open up new horizons in creative scholarly endeavor. The university has also sought to contribute to peaceful coexistence across the global community.”

**Japan ASEAN Science, Technology, and Innovation Platform (JASTIP)**

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**Activities**

**UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (WENDI)**

- Professor Kaoru Takara, Dean, Graduate School of Advanced Integrated Studies (Chair holder, UNESCO Chair WENDI)

**UNESCO International Hydrological Programme, IHP in Asia and the Pacific**

- Professor Yasunori Tachikawa, Graduate School of Engineering (Chair, The Japan National Committee for IHP)

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**Conclusion**

Kyoto University has been pursuing “Harmonious Coexistence” within the human and ecological community on this planet as a mission of our university since its establishment in 1897.

**Acknowledgment**

I would like to express my sincere gratitude to UNESCO Jakarta office for their kind invitation and great efforts to organize this meeting.
Youth Mobilizers and Community Coordinators for Post-Disaster Livelihood Recovery
Joshua Francisco V. Neol and Ginbert P. Cuaton

Introduction

On November 8, 2013, Super Typhoon (ST) Haiyan struck Northern Iloilo in the Philippines. The typhoon caused extensive damage, with agricultural fields, homes, and infrastructure destroyed. To address the immediate needs, the Agri-Business Caravan (ABC) Project was launched. This project aimed to mobilize youth to support livelihood recovery efforts.

Activities

The ABC Project was a multi-pronged approach, focusing on five activities across 10 regions: Farmer Organizing Workshops, Farming Entrepreneurship Trainings, Product Development and Quality Assurance Systems, Value Chain Development, and Agri-Business Caravan. Youth leaders were trained and empowered to lead resilience and entrepreneurship activities in their communities.

Conclusion

The following important lessons were learned during the ABC Project:

- Factoring in the local people’s skills, knowledge, and attitude during post-disaster situations is essential in implementing development projects.
- Partnership activities can be very helpful and productive when individuals in the community are tapped, trained, and empowered to lead and influence other members.
- Implementing livelihood recovery and rehabilitation activities using community-based resource management principles is highly effective not only in rehabilitating calamity-stricken areas but also in providing alternatives for food security and income to individuals needing them the most.

Acknowledgment

The authors thank the Business Fair Trade Consulting [bizFTC], Philippine Business for Social Progress [PBSP], Accenture Inc., and Smart Communications.
Space Technologies Facilitating Implementation of Sustainable Development Goals

Introduction

The International Centre on Space Technologies for Natural and Cultural Heritage under the auspices of UNESCO (HIST) was established in 2011. It is the first UNESCO Category 2 Centre dedicated to promoting, testing and demonstrating the applications of space technologies for better identification, conservation, management and sustainable development of World Heritage sites, World Biosphere Reserves and UNESCO Global Geoparks (hereinafter called "UNESCO Designated sites").

Since establishment, HIST conducted continuous cooperation research work with Cambodia, Sri Lanka, Italy, Brazil, Tunisia, Pakistan and Myanmar. With the support from CASEarth Program, HIST conducted several different case studies regarding to the Sustainable Development Goals, particularly focusing on SDG Targets 11.4 and 15.5 related to World Heritage sites and natural habitats.

Activities

As a World Heritage related UNESCO Category 2 Centre, HIST has taken a keen interest in SDG 11.4.

- HIST in a test study at Mt. Huangshan, a three-crown UNESCO designated site, observed that investments in preserving natural resources was beneficial to the ecological system of Mt. Huangshan and contributed to the sustainable development of the site.

- In a demonstrative study, HIST monitored strength of protection in 244 national parks in China, divided into several regions (Figure 1), as defined in SDG indicator 11.4.1 and compared the results with a new metric "investment per unit area" and found that it is more intuitive to measure the strength of protection by "investment per unit area" rather than "total expenditure per capita".

- HIST recommends revision of the SDG 11.4.1 indicator and also recommends broader international cooperation in future to establish a unified scoring standard for this indicator at a global scale.

In context of SDG Target 15.5, an Assessment of Giant Panda Habitat was carried out to estimate changes in panda’s natural habitats from 1976 to 2013 in China. The results showed that although the panda population increased from 1976 to 2013, disruptive anthropogenic activities and natural disasters have resulted in fragmentation and reduction of panda habitats. This study helped HIST highlight the importance of habitat preservation to ensure sustainability of wildlife preservation activity.

Conclusion

HIST has strong experience in utilizing Earth Observation and Big Earth Data, and is open to collaborate with UNESCO and other interested organizations from the UNESCO Natural Sciences family to development a cooperative platform to facilitate the implementation of the 2030 Agenda and the Sustainable Development Goals.
International Science Council, Regional Office for Asia and the Pacific

Introduction

The ISC is a non-governmental organization with a unique global membership.

- 140 National and Regional Scientific Organizations, including Academies and Research Councils and Regional Social Science Councils in Africa, Latin America, Asia and the Arab World
- 40 International Scientific Unions and Associations, across the natural and social sciences
- 30 Affiliates, including TWAS, AAS, IASA

The ISC was created in 2018 as the result of the merger between the International Council for Science (ICSU) and the International Social Science Council (ISSC).

Activities

Global scientific networks

International Research Programmes
- Future Earth
- Climate Research Programme (WCRP)
- Integrated Research on Disaster Risk Programme (IRDR)
- Urban Health and Wellbeing Programme (UHWPN)
- Comparative Research on Poverty Programme (CRPP)

International Scientific Committees
- World Climate Research Programme (WCRP)
- Global Geophysical System (GEOSS)
- Global Earth Observation System of Systems (GEOSS)
- Global Ocean Observing System (GOOS)
- Global Climate Observing Systems (GCOS)

Funding Programmes
- Transformations to Sustainability (Doi, Belmont Forum, Nurtures)
- Leading Integrated Research for a Sustainable Africa (Doi, Bosch Foundation)

ISC Regional Office for Asia and the Pacific

ISC ROAP was established in 2006 and promotes the development of science throughout the Asia and the Pacific and helps strengthen the voice of developing country scientists in this region.

ISC ROAP Principles of Engagement

- Encourage participation of early-career scientists and marginalized groups.
- Increase engagement with decision and policy-makers.
- Improve interaction with other Regional Organizations.

ISC Challenge Domains

Science: Projects and Programmes in 4 Domains of Impact

- The 2030 Agenda for Sustainable Development
- The Digital Revolution
- Science in Policy and Public Action
- The Evolution of Science and Science Systems

ISC ROAP Strategic Plan and Activities

- Science to Enable and Empower Asia Pacific for SDGs 2 (SEE AP for SDGs 2)
UNESCO Tehran

Introduction

- UNESCO Tehran Cluster Office covers Afghanistan, Iran, Pakistan, and Turkmenistan.
- UNESCO is a non-resident UN Agency in Turkmenistan and has national offices in Afghanistan and Pakistan.
- Objectives of SC Unit to create synergy among its four cluster countries to join forces in achieving SDGs, to support key participation of cluster countries in regional dialogues and initiatives that contribute to the wellbeing of the region (i.e., sustainable water resource management and water security are common issues across these countries).
- Approach: to promote water security across the region and attainment of SDG 6.
- SC is pivotal in fostering sustainable development in countries and beyond political borders.
- Climate change is posing multiple threats to the four countries but it can also be seen as an opportunity to bring countries to join forces and synergy across national borders.
- Weakness: the level of expertise, resources and technical needs are different in each of the four countries, making it difficult to develop common programmes across these countries.

Activities

1. Promoting Cooperation over shared water resources under the changing climate

In order to address the complexity of integrated water resources management and the challenges of working with riparian states, UNESCO Tehran has been building national capacities of its cluster countries to promote cooperation and dialogue on their shared water resources. The most recent activity in this regard has been the tailor-made training for Afghanistan and Iran on Transboundary Water Management in 2018.

- Venue: UNESCO Headquarters in Paris
- Timing: January 2018
- Beneficiaries: Government Officials, Universities and other national counterparts
- Brief summary: presentations made by renowned international experts with case studies and lessons learned from different regions in the world. Followed by a field visit to Germany and the Netherlands to see how they manage their transboundary waters together. The forum provided a chance for the officials of the two countries to express their needs and concerns outside of the formal context and better understand the needs of one another. Officials have expressed that the meeting had been very effective in setting an amicable tone for formal meetings and policy shifts.

2. Understanding the interlinkages of culture, religion and the environment in achieving SDGs

- What: Second International Seminar on Environment, Culture and Religion
- Who: UNESCO, UNEP and the Department of Environment of Iran.
- When: 23-24 April 2016
- Where: Tehran
- Brief description: Over 100 senior religious scholars, scientists, prominent academics, community leaders, NGOs and UN agencies from 18 countries came together discuss how culture and religion can contribute to the achievement of the SDGs. Christians, Buddhists, Hindus, Jews, Shias and Sunnis Muslims were the cultural and religious background represented. The importance of interreligious dialogue and its valuable contribution to promoting social cohesion, peace and development were underscored during the Seminar.
- Remarks: H.E. Hasan Rouhani, President of the I.R. of Iran opened the seminar, and was followed by other prominent Government Officials and a video-message of Ms Irina Bokova, former Director-General of UNESCO.

3. Simultaneous Earthquake Drills in Afghanistan, Iran and Pakistan to improve School Safety

Since 2016:

- Initiated simultaneous earthquake drills in schools across Afghanistan, Iran and Pakistan (earthquake-prone countries), aiming at boosting students’ readiness in the face of earthquakes and help make countries of the region less seismically vulnerable. Iran’s national earthquake drill simultaneously took place in 120,000 educational centers across Iran.
- Trained the 10 members of the Economic Cooperation Organization on School Safety and a holistic approach to DRR and Preparedness in Schools.
UNESCO International Centre for Water Security and Sustainable Management

Introduction

Water Security is a key cross-sectoral issue underlying the Sustainable Development Goals (SDGs) 2030 and is drawing increasing worldwide attention. As the international community seeking to tackle the water shortage of partner countries in the global south region, the UNESCO i-WSSM is established to enhance human welfare and quality of life for all through better water security.

The UNESCO i-WSSM is the first category 2 centre under UNESCO’s Natural Sciences Sector to be established in the Republic of Korea. Since its establishment in May 2017, the Centre has been undertaking integrated and problem-solving research on comprehensive water security solutions, providing case & field-oriented education and training tailored to different needs, and expanding globally networked cooperation platform.

Activities

1. Integrated & Problem-solving Research
   - Publishing Global Water Security Issues. GWSI
     - i-WSSM has set out to write and publish the GWSI series with UNESCO HQ, introducing successful case studies in water security. It will contribute to explaining water security as it relates to technology, social and economic development, and governance, the report provides useful and up-to-date information and insights for working-level officials and policymakers.
   - Publishing Korean Executive Summary of World Water Development Report, WWDR
     - Upon suggestion from the World Water Assessment Programme (WWAP) and with UNESCO’s exceptional approval for publication in a non-official language, i-WSSM published the Korean Executive Summary of the WWDR.
   - Global Joint Research for Proposing Possible Policies on Securing Water for Sustainable Growth
     - It aims to define the concept of “water security”, establish a framework for analyzing its effects on economic growth, and provide empirical analyses of domestic and international case studies, using the analytical framework.
   - On-site Field Diagnosis and Problem-solving Programme
     - i-WSSM organized two investigations in Battambang, Cambodia in 2018 to help the city develop a strategy for expanding its waterworks. The research was a joint effort in partnership with the Korean Ministry of Environment and the UN Capital Development Fund (UNCDF).

2. Case & Field-Oriented Education & Training

3. Globally Networked Cooperation Hub Building
   - Global Network Activities
     - We actively participated in international sessions and conferences during 2016 including 8th World Water Forum, Korea International Water Week, 7th Africa Water Week, etc.
   - Integrated Global Networking Database
     - i-WSSM developed an integrated global networking database system in partnership with the partner organizations in an effort to create a centralized database containing information about relevant experts and events.

Conclusion

Cumulative contribution of i-WSSM in the region can be summarized as follows:

1. Build an integrated research system to achieve sustainable water resources management, related in particular to addressing challenges faced by developing countries;
2. Case & Field-oriented education and training programmes based on the needs of global south;
3. Develop a globally networked hub for sharing water resources information and enhancing global scientific and technological knowledge on water resources.
Introduction

India is a multi-hazard-prone country where the role of Youth and Young Professionals (YYP) is crucial. The starting of professional and academic courses focusing on disaster and climate change to further science and technology integration into risk reduction initiatives make it mandatory for YYP to be active members in policy and action.

Based on multicity consultation meetings with YYPs, the Confederation of Risk Resilient Professionals (CRRP) was formed with an aim to provide a platform to the YYPs to promote practical application of Science, Engineering, Technology and Innovation (SETI) for disaster risk reduction for making India disaster resilient.

Activities

- Currently, CRRP has 140+ members and is exploring 5 regional chapters in different states of India.
- They have been e-meets with the DRR professionals who presently working outside India and also with U-Inspire in Indonesia, Pakistan, Nepal.
- CRRP has been holding introductory sessions with YYPs across India.

Case Study and Results / Achievements

Understanding Risk (UR) Filed Lab: Chiang Mai Urban Flooding (June 2019)

- It was a one-month long arts and technology conference in Chiang Mai, Thailand exploring critical design practices in disaster risk management, collaborative technology production, hacking and art.
- The job was to co-design, test and produce new ideas, analysis tools, sensing technologies, artistic pieces and communication products to address complex issues of urban flooding.
- The event was hosted at the International Sustainable Development Studies Institute. The space is itself an experiment in sustainable design and architecture. Made from shipping containers.
- CRRP was represented by Bhola Saha, who worked on “Nature-Based Solution” group. His work for the Nong Hoi Community, for solving issue related to urban flooding and had to come up with solutions targeting community and households. The fact sheets that were developed will be used as a part of submission for the UR Forum meet in Singapore in May 2020.

Conclusion

The introductory sessions and e-meets have helped in bringing cohesiveness among YYPs. We will engage in the following activities in future;

- Webinar/podcasts
- Evidence-based research projects
- University outreach
- Hackathons
University Collaboration for Nature Conservation and Sustainable Development in Japan’s UNESCO Biosphere Reserves

IDA, Yoshihiko Ph.D.
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2. Secretariat Advisor and Member of Academic Group, Mount Hakusan Biosphere Reserve Council, Japan
3. Member of Japanese Coordinating Committee for MAB

Introduction
The UNESCO Medium-term Strategy 2014-2021 indicates that the linkage between science and sustainable development is strongly connected shown as “SOS: Promoting international scientific cooperation on critical challenges to sustainable development”. On the other hand, the Lima Action Plan 2016-2025 of MAB and the Biosphere (MAB) programme emphasizes on educational activity at local level in the target of “B1.2. Regional education, capacity building and training programmes established, including university courses”. In Japan as of June 2019, ten UNESCO Biosphere Reserves (BRs) are currently recognized. The core areas and the buffer zones in each biosphere reserve are successfully designated as national parks, quasi-national parks, wilderness conservation areas, nature conservation areas, or forest reserves in general. However, we now need to develop a local learning activity with multi-stakeholders further for nature conservation and sustainable development especially in transition area. In this presentation, I aim briefly to introduce the cases of university collaboration with UNESCO biosphere reserves in Japan.

JBRN’s characteristics from educational aspects

Iida and Mammadova (2019) shows the results of questionnaire survey on educational activities in each BR. All the seven BRs answered have educational collaborations with educational sectors. Universities are mostly important key collaborators in educational activities as well as elementary schools (Fig. 1). As a role of university education, most of activities are conducted in buffer zone and transition area within BRs (Fig. 2). Many of BRs expects several educational and research programmes with university in the future (Fig. 3).

Some universities such as Kanazawa university and Miyazaki university conducts educational activities on local sustainable development with several stakeholders and other universities such as Shizuoka university and Shinshu university take an initiative to research the conditions of nature in their related BRs (Fig. 4). For further information regarding to this, I recommend to check the downloadable document, Mammadova and Iida (2018), and then to understand the cases of university collaboration with biosphere reserves in Japan, Russia and Belarus (Fig. 5).

Future aspects
International exchange program using BR network should be established to nurture young field professionals who can learn scientific and ecological monitoring skills with academic fields of other scientific approaches including water, ocean, social and humanity sciences, and simultaneously who can be also involved in sustainable development at community level in the field of culture, education and information of each BR. The establishment of training strategy through the field experience in UNESCO biosphere reserves to foster nature conservation skills and to cultivate the philosophy of local sustainable development should be stressed as concretely. Each country of course has its own strong points, for example, community learning of JBRN and scientific monitoring of many of BRs in EuroMAB, SeaBRnet, EABRN. These regional networks can bridge their own gaps and can take an innovative role through university collaborations with other UNESCO’s programmes which should be integrated for the local in the future within BRs.

Acknowledgment
This presentation includes the outcomes of the project “Joint development of University Education Program for UNESCO Biosphere Reserves in Eurasia” that was financially supported by (FY 2018) Official Development Assistance for UNESCO Activities, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan.
DEBRIS AND MUD FLOW WARNING MODEL
FOR CAMERON HIGHLANDS
Norlida Mohd Dom & Nursyarin Abd Samad

The Regional Humid Tropics Hydrology And Water Resources Centre For South-East Asia And The Pacific

Introduction

ESTABLISHED 27 OCTOBER 1999

FUNCTIONS
- coordinate the implementation of cooperative hydrological and water resources research projects and activities;
- network with IHP National Committees and other similar centres for exchange of scientific and technical information on research results;
- organize training courses, seminars, workshops and meetings for knowledge and technology transfer;
- produce related hydrological and water resources publications and media for distribution.

OBJECTIVES
- Promote a conducive atmosphere for collaboration through technology and information exchange, in education and science;
- Increase scientific and technological knowledge on hydrological cycle.

Activities

 Năm 1999

Case study and Results/Achievements

Agricultural Land and Department of Irrigation and Drainage Rainfall Telemetry Stations

Conclusion

Assessment of the model is able to estimate, tonne/yr/km² at downstream reach

Acknowledgment

Introduction

On May 4th, 1948 Afghanistan was admitted as a member of the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The Afghanistan National Commission for UNESCO is acting as a bridge between Afghan Government and UNESCO organization.

Afghanistan National commission for UNESCO is working in the field of Education, Culture and Science.

Our vision: An active and committed National Commission towards Educational, Cultural, Technological and Scientific development for ensuring peace and sustainable development in Afghanistan.

Activities

- Raised public awareness in 32 schools on how to protect the environment and reduce natural disaster.
- Introduced 21 Gov personnel to participate in Multi-hazard Watershed Management for Flood and Drought Control workshop organized by UNESCO Jakarta Office.

- Completed two joint scientific and research Seminars on (The Impacts of Climate Changes on Water Resources in Charncha Mast watershed) in upper Kabul River Basin) with the Afghan Minister of Energy and Water.

Case study and Results/Achievements

Discussions with representatives of schools for raising public awareness on Water, Sanitation and hygiene (WASH).

Discussion with Ministry of Water and Energy and National Disaster Management Authority as well as other related organizations officials for making plan on how to protect people from the threat of floods, as well as meeting with the.

Conclusion

According to our statute Afghanistan National Commission for UNESCO is committed to play active coordination role between various state agencies responsible for Science and Technology to achieve SDGs by the year 2030.

We work with the Ministry of Education to raise awareness of school students and teachers on the management of watersheds controlling risk of disasters in Afghanistan.
Introduction

The fulfilment of sustainable development goals need active cooperation and collaboration as boldly mentioned in Goal 17: Partnerships for the goals. This spirit of enhancing global cooperation must also be supported by effective domestic networking. In addition, the regional interconnectivity plays important role to develop strong platform in sharing ideas, knowledge and fostering innovation and coordinating policies.

Recently, Indonesia issued laws of the National System on Science and Technology (No. 11 year 2019) which implied the harmonization and integration of research, development, assessment and implementation activities under one National Body for Research and Innovation. With the complexity of innovation process chain, the coordination between the stakeholders in the regional level to ensure the fruitful dissemination is important. Thus, knowing the role and positioning of each stakeholder in the context of regional innovation system is necessary to build effective networking. This study objective includes to review the positioning of non-ministry governmental research institutes to support innovation platform in regional context.

Activities

The objectives of Regional Innovation System are increasing leverage for regional development, transfer of knowledge and technology; Helping SMEs to achieve good economic scale; creating a creative environment to foster innovation and cooperation and Building the synergy of stakeholders. These objectives are aligned with the Regional Development National Priorities, namely the Regional Economic Development Priority Activities, which include the application of technology and innovation to increase added value of economic commodity and regional competitiveness.

In 2012 Joint Ministerial No. 03 and 36 of 2012 Regulations was published between Ministry Research and Technology and the Ministry of Internal Affairs, concerning Strengthening Regional Innovation System. It implies the demand of coordination team for strengthening regional innovation system in each province or region. Regional Innovation System comprises the whole process for fostering innovation conducted between government institutions, regional government institutions of research, educational institutions, supporting institutions of innovation, the business world, and the community in the region.

The presence of Regional Research and Innovation Body in the region is a major science and technology resource for strengthening the development and dissemination of science and technology in accordance with the potential and needs of the region. Thus, a competitive region can be created through the implementation of science and technology.

Example of Research Institute role in Global/Regional Partnership

- Man and The Biosphere (MAB)
- Intergovernmental Oceanographic Commission (IOC)
- International Hydrological Programme (IHP)
- Management of Social Transformations (MOST)
- Memory of The World (MoW)
- Intergovernmental Bioethics Committee (IGBC)

Acknowledgment

ASEAN Foundation and U.S. Agency for International Development (USAID) through ASEAN Science and Technology Fellowship 2019/2020

Conclusion

The presence of Regional Research and Innovation Body in the region is a major science and technology resource for strengthening the development and dissemination of science and technology in accordance with the potential and needs of the region. Thus, a competitive region can be created through the implementation of science and technology. Indonesian Institute of Sciences (LIPI) with its branch offices takes important part to form effective networking between relevant stakeholders, local governments, communities and the private sector, afterward, pushing the initiative to actively participate in national and global level. LIPI also needs to give motivation, provide stimulation and facilities, and to grow a conducive climate and to collaborate with other institutional elements in science and technology network and assist the formulation of priorities and policy framework.
Facilitator for science-based risk management on multi-stakeholder platform

- as a key for sustainable development in Asia and the Pacific -

Toshio KOIKE and Kazu FUKAMI
International Centre for Water Hazard & Risk Management (ICHARM) / Public Works Research Institute (PWRI), Japan

Development has inherent risks.
→ Risk management is indispensable for sustainable development

Science & Technology can & should play an important role

Science and technology enable us to collect objective data and their quick archiving & integration, to improve holistic understanding, and to promote dialogue & co-design.

Facilitators for sound-decisions on risk management bridging gaps between multi-stakeholders and science

Water is a key bridging between climate processes and societal benefits. There are a lot of relevant stakeholders on benefits & risks on water. It is essential to have common language, “science,” as the base for their mutual understanding.

Platform on Water Resilience and Disasters is to make risk-management discussions & sound decisions based on holistic understanding with science. Facilitators are to bridge gaps between inter- & trans-disciplinary science and multi-stakeholders. ICHARM is helping to make such platforms in Asia.

Conclusion

Disaster risk management through multi-stakeholder platform based on objective, i.e. science-based data & knowledge is indispensable for sustainable development. Facilitators are expected to fill the gaps between science and society. ICHARM is going to help building IFI Platform on Water Resilience and Disasters in AP region.

Acknowledgment

ICHARM expresses acknowledgements to all the worldwide IFI members and the founders of Platform on Water Resilience and Disasters in Asia such as Indonesia, Myanmar, Pakistan, the Philippines and Sri Lanka.
Introduction

SEAMEO Regional Centre for Quality Improvement of Teachers and Education Personnel (QITEP) in Science (SEAQIS) was established on 13 July 2009 through the approval of the 44th SEAMEO Council Conference in Cebu, Philippines.

Vision

The Centre was envisioned to be a centre of professional excellence in the area of science teaching for teachers and education personnel within the framework of sustainable development.

Goals

1. To assist in the improvement of quality of science teaching at all levels and across all disciplines.
2. To establish research networks to encourage sharing of research findings and best practices among SEAMEO Member Countries.

Programme Thrust

- Professional Teacher Development
- Learning Resources Development
- Professional Learning Communities

Activities

As stated in Center’s vision and mission, all programmes conducted by our institution is an effort to support SDGs no 4, target 4.C that focuses on increasing the supply for qualified teachers through international cooperation and teacher training. There are also several specific programmes related to MAB as follows.

SEAQIS was hosted STELR-STEM Renewable Energy Programme (in collaboration with the Australian Academy of Science and Engineering (ATSE)), with the main focus on Wind and Solar Energy, Solar STEM, Climate Change and Ocean, Water in the 21st Century, and Sustainable Housing and Sustainability.

Since 2009, SEAQIS has been developing whole school approaches in the promotion of environmental education through Training Course on Environmental Education for Sustainable Development (EESD). The programme aims to improve the competence of science teacher in integrating environmental issues (Climate Change, Disaster Risk Reduction (DRR) and Global Citizenship) into their teaching and learning activities.

Furthermore, with support from The Office of Climate Education (OCF-France), the programme becomes part of SEAQIS’ initiative to establish the Regional Office for Climate Education as an Asian network in regard to climate change education.

Not solely a general topics in SDGs, SEAQIS also concern on local topics such as community development through initiating a Training on STEM and EESD-Based Science Learning: Mangrove Utilization as a Learning Resource for teacher in coastal area. The training aimed to improve science teachers’ awareness towards mangrove conservation and its role in climate change issues.

Achievements

Since Center establishment in 2009 up to July 2019, 8084 teachers have been trained to improve their capability in several aspects from pedagogy, science content, and education management. 357 of them are participated in EESD Programme with satisfying outcome. Most of the alumni play a role as agent of change in their respective institutions, even several alumni have succeeded to prove themselves by winning recognitions from national and international institutions related to their works in enhancing environmental education in their schools.

Conclusions and way forward

While continuing Center’s excellence in improving the quality of science teaching and learning in schools, SEAQIS will strengthen its core to provide capacity building programmes that give a concern to the environmental education, ecosystem conservation, and their supports to sustainable development.

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Introduction

School on Internet Asia (SOI Asia) is a platform for sharing knowledge and experience over the Internet among Asian universities and students using technology. Since its inception in 2001, SOI Asia has organized and delivered lectures and workshops using satellite Internet, in collaborations with its partners, such as UNESCO and Mozilla Japan.

http://www soi asia

Activities

SOI Asia collaborated with UNESCO Office Jakarta in various online and face-to-face activities for more than 10 years, conducting and broadcasting sessions, workshops, and master classes. The activities are mainly linked to the quality education, climate action, clean water, as well as in the promotion of culture.

Case study and Results/Achievements

On October 12, 2017, UNESCO Jakarta and SOI Asia partners conducted "The Regional Workshop on Promoting Use of Local and Indigenous Knowledge Systems (LINKS) in ICT to Deliver SDG 17 in Timor Leste" with the participations of partners and stakeholders in Jakarta and Dili.

On November 25, 2011, UNESCO Jakarta and CONNECT-Asia partners conducted an connectivity event titled “Building a Green Society”, with the attendance of the Director-General of UNESCO from Jakarta, several experts, and with the participations of many partners and general public.

Conclusion

SOI Asia and UNESCO Office Jakarta collaborate in sharing knowledge in various areas mainly related to SDGs 4, 6, 13, and 17. We will continue to develop this platform with an eye in expanding to other SDGs.

Acknowledgment

Japan Fund in Trust, WIDE Project, SKY Perfect JSAT, Asian Internet Interconnection Initiatives (AI3), INHERENT, MYREN, PREGINET, UNINET, LEARN, NREN, APAN, TEIN
Currently in Indonesia there are 5,590 rivers, 840 large lakes, 735 small lakes and 162 reservoirs, totally make up as wide as 1.8 million ha of water body with water volume of 500 million m3. The major water-related environmental problems are flood, water shortage, soil erosion and sedimentation, water contamination, habitat destruction and over exploitation. The problems are triggered by in harmony interaction between those type water bodies and the adjacent catchment area. Ecohydrology encourages effort making to solve the problems integratively by increasing the understanding of key processes in the carrying capacity and resilience of ecosystems to the environmental stresses. Ecohydrology is a sub-discipline of hydrology focused on ecological aspects of the hydrological cycle. Ecohydrology is an integrative science that focuses on the interaction between hydrology and biota. The concept emerged as a transdisciplinary approach to finding solution-oriented methods for reducing anthropogenic impacts on ecosystems, such as inland waters ecosystem (river, lake, reservoir, swamp, peatland, etc). Indeed, the transformation of landscapes in recent decades, from pristine ecosystems to highly-impacted systems has entailed negative effects on their natural processes. It is with the aim of reversing these that ecohydrology seeks to reinforce ecosystem services in these modified landscapes. Additionally, aiming to achieve sustainability in both ecosystems and populations, as well as to improve Integrated Water Resources Management, ecohydrology leads the way for the accomplishment of the Sustainable Development Goals (SDGs) on Water (Targets 6, 13, 15). Through managing dual regulation of hydrology and biota, ecohydrology seeks to take into consideration five multidimensional parameters within river basins: Water resources; Biodiversity; Ecosystem services for society; Resilience to anthropogenic stress and climate changes impacts; and Cultural dimension.
Introduction

DACRYN is a group of highly motivated young professionals from Central Asian countries promoting Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA).

Our mission is to strengthen scientific and practical capacities of young professionals and empower youth in the fields of DRR and CCA.

There are young scientists and professionals from institutes of seismology and geography, national agencies for hydro-meteorology and muicflow protection from Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan who are willing to take on these challenges.

The network was established during the UNESCO Sub Regional Workshop on Mobilization of Youth and Young Professionals in Science for DRR in Central Asia, organized by UNESCO office in Almaty in March 2019.

Since then, we have conducted several meetings in national universities in order to advocate for DRR in higher education, and a coordination meeting of network members was held to define its work plan for 2019-2020.

We have focal points in Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan who are leading the activities of the network at national level.

Activities

1. Capacity building of youth in science for DRR and CCA. We organize seminars, trainings and workshops with strong focus on practical experience, support to implement relevant research in the region, and apply it in practice.

2. DRR advocacy in higher education. In cooperation with research institutes, universities and agencies, we conduct seminars in universities to advocate for more studies on DRR and CCA.

3. Community awareness raising. We closely communicate with media and develop practical useful materials in order to raise the knowledge about disasters in communities living in disaster prone areas.

More info and members see here https://dacryn.info
INTRODUCTION

Access to clean water in Indonesia and other developing countries is still very low. United Nations targets to ensure availability and sustainable management of water and sanitation for all as one of the development programs as outlined in the SDGs. Consuming unhealthy water can cause water-borne diseases such as diarrhea, cholera and other digestive diseases. Limited of clean water access and sanitation also has a major contribution to stunting. Reliable and cost-effective water treatment technology is needed to improve clean water access. Water treatment plant located in the Research Center for Limnology - LIPI, Cibinong adopted IPAG 60 technology to treat raw water from Lake Cibuntu, Cibinong. This research aim to determine the performance of IPAG60 for the treatment of turbid water from Lake Cibuntu. Comparative study between produced water from IPAG60 and local water company (PDAM) has been carried out.

METHODS

RESULTS

CONCLUSION

Turbidity of Lake Cibuntu varies from 2 to 76 NTU. This value is determined by the season. IPAG60 can treat turbid water from Lake Cibuntu into clean water based and whose all measured parameters close to the required standard of Regulation of Ministry of Health Republic of Indonesia No 492/2010. The performance efficiency achieved 100% on biological, 80% on chemical, 85% on physical and can be maintained for 3 months of operations. Comparative study between produced water from IPAG and PDAM showed that both of them had the same quality except on physical parameters of IPAG60 is better than PDAM.
Biophyt: A promising remediation technique for oil-contaminated beach sediments in Indonesia

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Abstract

Crossed by Maritime activities across the Malacca Strait to the South China Sea, the northern coastal area of Bintari Island, is an important area to develop and apply remediation technique for oil contaminated-beach sediments due to frequently impacted by a sea-based oil spill. Therefore, well composition and time incubation of remediation technique using mangrove and immobilized bacterial consortium are required to minimize the impacts of oil pollution on coastal ecosystem health. Moreover, these study also will provide sustainable and environment friendly on preserving method on improving mangrove ecosystem services and supporting SDGs implementation in Indonesia. In this study, combination of bioremediation and phytoremediation or “biophyt” was applied as a promising remediation technique for oil contaminated-beach sediment, started from 2018 until 2020. Briefly, in the first year, we identified and measured characteristics of mangrove ecosystem, oil fraction and heavy metal contamination, and indigenous microbial community in mangrove sediments and mangrove tissues. After that, in the second year, we started and applied a pilot-scale experiment in mangrove ecosystem with five different treatments to investigate the elimination rate (ER) of oil fraction and heavy metal in treatment sediments, fate and behavior of microbial activity in treatment sediments and mangrove tissues, and toxicity of treatment sediment to marine biota; while in the last year, we will take a feasibility and effectiveness valuation of the Biophyt remediation technique to ensure their safety and sustainability. The results from the first-year study showed that mangrove characteristics were on well condition based on the investigation of sapling, seedling, tree density, canopy height, and morphometric. The dominances of mangrove species were Rhizophora spiculata in the seaward zone, following in high variation between Xylocarpus granatum, and Ceriops tagal in the landward and middle zone. Accumulation of heavy metal Cd, Pb, and Ni were determined with high variability between mangrove tissues, while polycyclic aromatic hydrocarbon (PAH) was detected at low concentration in all mangrove tissues. The indigenous bacterial community in mangrove sediment were detected of 103 bacterial isolates (including the 14 most PAH resistant isolates and 10 heavy metal resistant isolates) and 11 Actinomycete isolates. These results from first-year study indicate that further research in second year is needed to optimize Biophyt technique.

Keyword: Biophyt, coastal ecosystem, tropical sediment, remediation, Indonesia
INCT Mandate and Activities

Afonso Almeida

Abstract

INCT was created in 2014 by the V Constitutional Government based Decree Law no. 24/2014, to upgrade human resources, promoting scientific knowledge, technology - innovation and its application to a sustainable development of all areas that might bring about Timorese to a more competitive of scientific knowledge and technology in a global society as well as to ensure the wellbeing of Timorese people.

In order to achieve the above mission statement, several key programs have to be done within the fiscal year of 2019 and onward which are (1) promotion of Pure and Applied Research in Social Science and Humanities, good governance, law, Engineering, Agriculture - rural development, Earth Science, Biodiversity - Environment and other cross cutting issues, (2) recruitment process of governing body which composes of four councils (General Council, Executive Council, Scientific Council, and Fiscal Council) and 4 Departments of Ethics, Social Science and Humanities, Natural Science - Exact as well as Technology - Innovation, (3) creation of Digital Repository and laboratories, (4) Formation of Young researchers in research methods, research proposal and scientific writing, (5) researchers’ mobility of Timorese researchers to partners universities or research institute in other countries or vice versa to conduct research together and the result might be published in any scientific Journals, (6) accreditation of the scientific journals of the private and public universities in across the country, (7) Research on “village’s visits” to evaluate the VIII Constitutional Government’s project done during the fiscal year 2020 and then recommend to government for any further decision.
Strengthening Governance of Biosphere Reserves in Indonesia

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The Indonesia MAB National Committee, Indonesian Institute of Sciences (LIPI)

Introduction

The function of the biosphere reserve in the context of the program consists of: conservation, international research and monitoring, and sustainable development (Baltisse, 2001; Price, 2002: UNESCO, 2006; Ishwaran et al., 2008). The concept of a biosphere reserve (BR), developed by the UNESCO MAB Program, represents a distinctive feature in efforts to harmonize conservation and sustainable use of biodiversity supported by science, technology and innovation, these including the fulfillment of a combination of roles through a zoning system including core areas, buffer zones, and transition areas.

The MAB Program in Indonesia applies the concept of biosphere reserve as a vehicle for sustainable management by means of biodiversity and ecosystem management through ecological, socio-economic and socio-cultural balance through the active participation of stakeholders. To achieve these objectives, strengthening governance is needed by establishing institutions and frameworks for the application of the best concepts that could drive the diffusion of program objectives to the site level.

Problems Mapping, Possible Solutions and Activities

The application of the three functions of biosphere reserves is the responsibility of translating the BR concept to the management authorities involved in the management of the biosphere reserve area. Meanwhile there is still a balance gap between the socio-economic perspective and the ecological perspective in the program of the stakeholders in Indonesia.

This article is an experience of the Indonesia MAB Committee over the past 10 years developing governance to support the successful application of the biosphere reserve concept. The aim is to increase the effectiveness of the application of the concept of BR and improve sustainable management of natural resources and ecosystems. Systematic steps were initiated by identifying the potential, strengths and weaknesses as well as opportunities and threats in biosphere reserves in Indonesia.

The fact shows that the application of the BR concept has many weaknesses, especially regarding the collaboration of the parties, management institutions, program integration, strengthening legal aspects, as well as the commitment and participation of the parties to support more effective governance at all levels especially at local government. The conditions of the management of the biosphere reserve reveal that there are still gaps, namely human resources, communication, coordination, active participation, national and regional government support, funding, and political support. Activities conducted, therefore, more focusing on solving the problems to minimize the gaps.

Conclusion

Weaknesses in the implementation of the concept of biosphere reserve in Indonesia could be improved by: (a) enhancing communication and coordination among stakeholders; (b) encourage active participation and commitment and encourage capacity building of the parties; (c) strengthening management institution; (d) strengthening programs by integrating the priorities of key stakeholders’ development programs into biosphere reserve management and action plans; (e) strengthening legal aspects at the local, regional and national levels; (f) encourage the commitment of the government and key parties in funding sustainability for the biosphere reserve development program; (g) political and policy support for the implementation of the concept of biosphere reserve; and (h) strengthen the role of the Indonesian MAB National Committee as the center of communication and facilitator of the national dialogue on sustainable development. The level of improvement of each aspect is varied but it has been progressing towards a better governance which could be achieved through integrated and multi-sectoral approaches.
Indonesia Global Compact Network (IGCN)-Water and Climate Program

Introduction

Indonesia Global Compact Network (IGCN) is a Local Network of the United Nations Global Compact, the largest network in the world for corporate sustainability initiatives. A call for companies to equate strategy and operations with the universal principles of human rights, labour, the environment, and anti-corruption, and take action that can advance the goals of society.

IGCN’s programs:
- Business and Human Rights
- Children’s Rights
- Women’s Empowerment
- Water
- Climate
- Circular Economy
- Sustainable Fashion

Relevance and Link with SDGs

Activities

"Water Security and Sustainable Living in Small Islands & Coastal Area"

This project is a multi-year joint project undertaken between UNESCO Office Jakarta and IGCN in a wider partnership with government and private sector. The project includes Komodo World Heritage site and Biosphere Reserve, Wakatobi biosphere Reserve, and Berbak-Sembilang (proposed to be a new Biosphere reserved). In addition to ensuring water security, the project also aims to support local community initiatives, including local entrepreneurship. The scope is set to expand to other island communities in the country.

“Biopore Campaign Program”

IGCN in collaboration with Indonesia Water Mandate Working Group (WMWG) conducted Biopore Campaign Program since 2013, call for companies, NGOs, and academias to participate in this campaign as it is a very solutive way to combat flood, drought, and organic waste cumulation in urban areas. Participants are expected to implement this program near their operating operations, set their targets, and send the reports to IGCN and WMWG. The success of our participants in implementing this program will be presented in World Water Day and World Water Week to inspire more stakeholders in reserving our living environment.

Case Study

“Community Education to Raise Awareness of Water Security and Water Quality in Pari Island, North Jakarta”

IGCN started a project titled “Community Education to Raise Awareness of Water Security and Water Quality in Small Islands” at Pari Island, Jakarta, in collaboration with Habitat for Humanity Indonesia (HFHI) and Indonesia Institute of Scientists (LIPI). This project was supported and funded by UNESCO and co-funded by Asia Pulp & Paper Group (APP Group). To address issues on water and waste, Pari Island community has received trainings on WASH (Water Sanitation & Hygiene) and Waste Management training as well as Water Resource Management workshop. Following these trainings workshops, the impact on the community’s knowledge and understanding were assessed.

Way Forward

IGCN is committed to support corporations in preserving clean water by establishing Indonesia Water Mandate Working Group (WMWG). This mandate encourages corporations to take active measures in managing its water consumption responsibly and to contribute in addressing water issues outside its operation boundary line.

Acknowledgement
Disaster Risk Reduction (DRR)

Introduction

Disaster Risk Reduction and Tsunami Information Unit (DRRTIU) was established in 2012 jointly by the Science Sector and IUC of UNESCO. Under the direct supervision of the Director and Representatives of UNESCO Office Jakarta, the DRRTIU follows the programme and activity of the coordinator for Disaster Risk Reduction and Resilience, Section on Earth Sciences and Geo-hazards Risk Reduction-Natural Sciences Sector. As DRR is across the sectors, DRR was also implemented in Culture unit, Education unit and other Science units. Within IUC, DRRTIU is responsible for the Indian Ocean Tsunami Information Centre (IOTIC) under the coordination of IUC/UNESCO Tsunami Unit programme and in close coordination with the intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System.

DRR and Sustainable Development Goals (SDGs)

The DRR Program contributes in achieving SDG goals, specifically Goals 4, 6, 11, 13, and 17 as well as responding to Global Framework among other UNESCO Framework for Disaster Risk Reduction (SFDRR) and the Comprehensive School Safety Framework (CSS). Since global climate change gives rise to climate variability and weather extremes, the risks of natural disasters will constantly increase. The 2030 Agenda for Sustainable Development recognizes and reiterates the need to reduce the risk of disasters. The activities of DRRTIU mainly contribute to SDG 11, by focusing on ‘Integration and adaptation to climate change, resilience to disasters, and development and implementation in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels’. The activities also contribute to SDG 4 by focusing on School Safety; to SDG 13 by strengthening Resilience of climatic impacts; to SDG 6 by focusing on Flood as well as to SDG 17 by gathering Youth and Young Professionals for DRR. The activities include training, workshop, the development of IEC material, making of video promotional, establishment of forum and platform, research and study, assessment, and the development of project guidelines in partnership with universities and government agencies.

What has been done and contributions towards Sustainable Development Goals

**Strengthening Science, Engineering, Technology and Innovation for Disaster Risk Reduction in the Asia and The Pacific**

In 2017, the Regional Science Bureau for Asia and the Pacific, UNESCO Office Jakarta published the Regional Bureau Science Support Strategy on Science, Engineering, Technology and Innovation (SETI) for DRR in Asia and the Pacific. This strategy is to prioritize and streamline the programmable DRR measures in Asia and the Pacific to build resilience and mitigate risks. As the Regional Science Bureau, UNESCO Office Jakarta will work to ensure continuous and close coordination between all 13 field offices in Asia and the Pacific. Particular emphasis will be placed on SETI for Risk Assessment: Prevention, Preparedness and Risk Reduction; Early Warning System; Resilience and Sustainable Development.

**Strengthening Resilience of Coastal and Small Island Communities towards Hydro-meteorological Hazards and Climate Change Impacts (SiResCom)**

The Strengthening Resilience of Coastal and Small Island Communities towards Hydro-meteorological Hazards and Climate Change Impacts (SiResCom) is a three-phase project being implemented by UNESCO Office Jakarta in the Philippines, Indonesia, and Timor-Leste since 2010. The project is funded by Japan Fund in Trust (UNESCO-JFT). The project aims to strengthen the resilience of coastal and small island communities towards hydro-meteorological hazards (HH) and climate change impacts in the three countries. The objectives of the third phase is to enable governments and communities to develop policies, community action plans and models to tackle HH and climate change impacts.

**DRR in Heritage Site**

Historic cities require special attention and alternative approaches to disaster risk reduction as heritage buildings are not replaceable and cannot be treated just as any other buildings. This project is to build capacity for Disaster Risk Reduction (DRR) of heritage cities in Southeast Asia and Small Island Developing States (SIDS), while also developing and integrating DRR strategies into the overall management plan of heritage cities. The project consists of several activities, designed to enhance the capacity of stakeholders involved in DRR of heritage cities in Southeast Asia and Pacific and to empower communities living in heritage cities through the improved management plans that include DRR strategies.

**Flood Technology & Disaster Risk Reduction**

As a response to the 2013 devastating floods in Pakistan, UNESCO in cooperation with the Government of Japan has started a major project on ‘Strategic strengthening of Flood Warning and Management Capacity of Pakistan’. During the first phase from July 2011 to September 2014, the project has developed the flood forecasting system using satellite technology. The system enables the Government of Pakistan to have a prior notice of a potential flood event in the targeted areas. The second phase of the project has started in 2015, involving cooperation with neighboring countries of Pakistan such as Afghanistan.

**Youth and Young Professionals in SETI for DRR**

The project aims to develop young professionals in the fields of multi-disciplinary disaster risk reduction and build understanding among youth and young professionals on their role in SETI for DRR in countries in Asia and the Pacific. The project also establishes and promote Li-INSPIRE platform for Youth and Young Professionals Innovation, Science, and Technology for Resilience.

**VISUS (Visual Inspection for defining the Safety Upgrading Strategies) Adaptation for Disaster School Safety in Indonesia and Mozambique**

The adaptation and piloting of VISUS in Asia and Pacific was done in 10 schools in Lao, 140 schools in Indonesia. In addition, UNESCO Office Jakarta supported the piloting of 100 schools in Mozambique in coordination with UNESCO Maputo and Paris. A mobile application of VISUS Fader was also developed to support the surveyor in data collection of school safety. This project was implemented with the support of Indonesian Fund in Trust and World Bank. VISUS responded to Pillar 1 of the Comprehensive School Safety.

**School Tsunami and Earthquake Preparedness Assessment (STEP-A)**

Indonesia Institute of Science (IPI), UNESCO Office Jakarta and UNDP developed the school preparedness assessment tool for earthquake and tsunami. STEP-A is a mobile application tool based on the Earthquake and Tsunami School Based Disaster Preparedness Assessment Methodology developed by IPI, UNESCO and UNDP in 2006. This methodology assessed schools’ preparedness based on five parameters: School policy; Hazard and disaster knowledge; Preparedness and response plan; Early warning system; Resilience mobilization capacity. This methodology has been used to assess more than 200 schools in 18 provinces in Indonesia. STEP-A has been piloted in schools in Indonesia and is now being promoted by UNDP through their project Better Build School Safety in 18 countries in Asia and the Pacific. STEP-A responded to Pillar 2 and 3 of the Comprehensive School Safety.

**International Disaster Resilient Architecture (INTRA)**

A project looking at a holistic approach towards a disaster resilient built environment by promoting the importance of traditional building knowledge in construction. Following the example of vernacular architecture, new built construction should consider local culture, climate and environment, and thereby encourage climate change mitigation and adaptation.
International Geoparks and Geoscience Programme (IGGP) in Asia and the Pacific

Introduction
The IGGP comprises two pillars: the International Geoscience Programme (IGCP) and the UNESCO Global Geoparks (UGGs) which for over 45 years has brought geoscientists together from all regions of the world to study the Earth and geological processes under themes that have increasing societal relevance. UNESCO is the only United Nations organization with a mandate to support research and capacity in geology and geophysics, and the International Geoscience Programme is one of the flagship programmes. For over 45 years, UNESCO and the International Union for Geological Sciences (IUGS) have been collaborating to mobilize global cooperation in the Earth Science through the international Geoscience programme (IGCP). This Programme has provided a platform for scientists from across the world to push the frontiers of knowledge forward through concrete projects.

IGGP and SDG 13 (Climate Action) in the Asia and the Pacific Region
UNESCO Global Geoparks (UGGs), which serve as global field observatories for climate change, have already felt the impact of it. Moreover, International Geoscience Programme (IGCP) provides us with invaluable knowledge about the Earth, which is essential for responding to climate change. To respond to climate change, IGCP and IGGP have the following functions:

- Data Collection: IGCP acts as the records of past climate change and educators on current climate change.
- Green growth: IGCP promotes green growth in the region by utilizing renewable energy and employing the best standards of “green tourism.”
- Education: IGCP acts as outdoor museums, which aim to raise awareness on the effects of current climate change thus giving the opportunity to show visitors how climate change can affect our environment.
- Knowledge Hub: IGGP provides a platform for international scientific cooperation in the geosciences, to promote sustainable use of natural resources, advance new initiatives related to geo-diversity and geo-heritage and geohazards risk mitigation.

What has been done and contributions towards climate change
IGCP: ICGP608 “Cretaceous Ecosystems and Their Responses to Paleoenvironmental Change in Asia and the Western Pacific”
- Funded by regular programme
- The aim of the project is to delineate the Cretaceous ecosystems and how they responded to the paleo-environmental changes that affected the South-East Asian and adjacent Western Pacific region. This project has integrated the current knowledge of Cretaceous land, ocean, biosphere and ecosystems in each participating country.
- Until 2019, the Geocorversity Center at Chonnam National University (Gwangju, South Korea) for geo-tourism and Geocorversity of Mudeungsan Area National Geopark was established, and the Geopark consisting of the Cretaceous volcanics and fossil sites was approved as UNESCO Global Geopark on 30 May 2019. Moreover, there were several public lectures for adults and children on these topics. They published a scientific book consisting of 108 papers in peer-reviewed, international journals and 25 papers in domestic journals.
- The Sixth International Meeting of ICGP608 was successfully held in Khon Kaen Province, Thailand on 15-16 November 2018, as the last official international meeting of this project. Two big dinosaur museums, Phu Pha Boot Research Center and Dinosaur Museum, and Sirindhorn Museum were the remarkable highlights of this meeting.

Especially, both museums and regions are in action toward national geoparks related to well-studied Cretaceous non-marine sedimentary successions abundantly with a variety of dinosaurs, crocodile, turtles, shark, fish and freshwater mollusks. We could realize that the Cretaceous Khorat Group have well investigated palaeontologically, and their results are utilized for earth science education and public awareness.

UGGp: GEMS in AP: UNESCO Global Geoparks for Enhanced Multidimensional Sustainability in Asia and Pacific
- Funded by JFIT
- GEMS in Asia and the Pacific Region aims to contribute to a societal transformation across Asia and the Pacific region through achieving a balanced geographical representation of UNESCO Global Geoparks, and improve communities’ lives and environment in a sustainable way.
- Main activities include a mapping of regional needs assessment in capacity building for establishing UNESCO Global Geoparks, by developing an online introduction package on UNESCO Global Geoparks based on previous GGN training workshop’s feedback, developing an online questionnaire for regional needs assessment mapping and establish the project e-platform. Capacity development for member states to apply for or renew UNESCO Global Strengthened Geoparks networks and membership in Asia and the Pacific region.
- From May 27th-30th, 2018, the Regional Training Course on UNESCO Global Geoparks Perspectives for National Commissions for UNESCO in Asia and the Pacific Region was held at the Ok Islands. After the development of the open online introduction course on UNESCO Global Geopark (http://correct-asia.org/correct-asia-e-learning-platform/), this training course was the second activity under this project supported by JFIT. Participants from all over Asia and the Pacific region were taking part to learn about how to start and develop geoparks, share experiences, and strengthen networking. The training course is also available on JFIT e-learning platform: https://leearning.jfit.asia/.

UGGp: GEMS in AP: UNESCO Global Geoparks for Enhanced Multidimensional Sustainability in Asia and Pacific
- 60 geoparks in 8 countries in Asia and Pacific region (April 2019)
- Aspiring Geoparks in Central Asia and South Asia
- 2 UNESCO Category 2 Centres
- APGN: Asia Pacific Geoparks Network
- National Geoparks Committees or equivalent
- The first international meeting and workshop on UNESCO Global Geoparks was held in Qeshm Island during 26th – 30th April 2018. The conference brought together 250 local participants and representatives from over 20 foreign countries.

UGGp: GEMS in AP: UNESCO Global Geoparks for Enhanced Multidimensional Sustainability in Asia and Pacific
- The Sixth International Meeting of ICGP608 was successfully held in Khon Kaen Province, Thailand on 15-16 November 2018. More than 140 participants from 11 nations including Thailand, presented 5 keynotes, 27 oral and 14 posters in two days oral sessions and a poster session.
Japanese Funds-in-Trust (JFIT)

Contribution of JFIT funded programmes

JFIT has supported various UNESCO Science programmes in Asia and the Pacific, including the early ages of Biotechnology with Microbiology (since 1973) and IHP-Training Course (since 1991) in its over 40 years history, and the implementation of the IOC Harmful Algal Blooms programme by IOC/WESTPAC (Since 1980s). JFIT has been instrumental in establishing intergenerational networks and platforms for exchange of good practices, knowledge in the field related to IHP, MAB, IOC and IBSP programmes as well as capacity building, research collaboration opportunities and mentoring through Japanese expertise and leadership for the whole region.

JFIT programme have been leading cross-programme collaboration promotion and implementation.

In particular, there have been several cross-cutting projects overarching and connecting two or more programmes.

Cross-cutting projects:

- **Fostering and Enhancing Synergies among Science Networks in Asia and the Pacific Region (All Natural Sciences programmes), 2019-2021:**

  The project fosters inter-sectoral collaboration among established science stakeholder networks, and provides pathways to the achievement of SDGs by making full use of UNESCO Natural Sciences programmes and UNESCO sites in Asia and the Pacific through regional science workshops, seed pilot projects at UNESCO sites, and development and delivery of E-learning course (MasterClass).

- **COMprehensive Programme to Enhance Technology, Engineering and Science Education (COMPETENCE) in Asia: The Role and Contribution of Higher Education Institutions (Phase V) (IHP, MAB, IOC, DRR, and Sustainability Science), 2016-2018:**

  Established an e-learning course in partnership with IHP, MAB, IOC, DRR, and Sustainability Science partners of Asia and the Pacific region.

- **Fostering UNESCO Water and Environment Networks in the Asia-Pacific Region (IHP, MAB, IGGP), 2014-2017:**

  Training Course, Regional IHP meeting, and SeaBRnet Meeting were held with overarching topics of water and environment for enhancing regular contact and collaboration of IHP and MAB science activities at the regional level. A major meeting in Bali, Indonesia, brought IHP, MAB, IGGP, and the World Heritage community together.

- **Sustainability Transformation Across the Region (STAR) (Sustainability Science, IBS, IHP, MAB, and IOC with collaboration with SHS sector in Paris and Jakarta), 2014-2017:**

  Science networks of IHP, MAB, and IOC experts contributed inputs to develop a framework and tools to implement sustainability science. Several global and regional meetings were held.

Resources available from JFIT Projects:

- Three practical guidelines for managers of Biosphere Reserves - Documents are available at UNESCO Digital Library (https://unesdoc.unesco.org/home) and UNESCO Jakarta Website.
  2. Comparative law study on the implementation of biosphere reserve zonation in the Asia Pacific Region: executive summary.

- MasterClass series - E-learning courses are available at "CONNECT-ASIA" website (http://connect-asia.org/).
  1. Climate Change in Pacific Islands
  2. UNESCO Biosphere Reserves as Learning Laboratories for Sustainability
  3. Community Based Flood Management
  4. Sustainable Development on south-south Cooperation
Introduction
As a UNESCO entity, the Indian Ocean Tsunami Information Centre (IOTIC) in Jakarta has been supporting the Indian Ocean member states for reduction of tsunami disaster risk and preparedness against tsunami disasters. In particular, working closely with the IOC/ITWMS (The Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System), IOTIC provides tsunami information and data to the Member States, organizes training programs, and handles post-event performance surveys and reports. Besides, UNESCO Office Jakarta will focus on two IOC Programmes, Safe Ocean and Ocean Literacy, in conjunction with the UN Decade for Ocean Science for Sustainability (2021-2030).

Ocean Hazard, Safe Ocean, and the SDGs
The most recent tsunami was the 2013 Sulawesi earthquake and tsunami and Sunda Strait tsunami that struck Indonesia. More than 2,400 people are killed because of these two disasters. In order to reduce this ocean hazard, IOTIC focuses on capacity building and preparedness for tsunami hazard contributing to SDG 11 (Make cities and human settlements inclusive, safe, resilient and sustainable) and SDG 4 (Incorporate a risk reduction approach in implementing preparedness, emergency response and recovery programs in the education sector).

The ocean has an influence on human and human impacts the ocean. Since the ocean and human are inextricably interconnected, a human cannot live without the ocean. People should concern about the health and clean ocean. For example, the ocean provides us the oxygen, fresh water, and food as well as affects weather and human health. Everyone is responsible for caring for the ocean. DRRTIU in UNESCO Office Jakarta will support the implementation of Ocean Literacy to achieve SDG 14 (Conserve and sustainably use the oceans, seas and marine resources for sustainable development) and SDG 17 (Strengthen the means of implementation and revitalise the global partnership for sustainable development).

IOTIC-BMKG Programme Office
Under the Partnership Agreement between IOC/UNESCO and the Government of Indonesia, the Agency for Meteorology, Climatology, and Geophysics (BMKG) supports the implementation of Programme and Activities of IOTIC for five years (2017-2021):
- Annual Indian Ocean Regional Workshop (IOW-RW)
- Annual Indian Ocean Capacity Building Programme (IO-CAP)
- Study / Research (IO-SEARCH)
- Tsunami Education, Awareness, and Preparedness Materials (TEAM-I0)
- Communication and documentation of Indian Ocean Tsunami Wave Exercises (IOWaves) and World Tsunami Awareness Day (WTAD)

What has been Done and Contributions towards SDG
Fostering Tsunami Preparedness, Response, and Mitigation in the Indian Ocean Small Island Developing States and Developing Countries
This project's main goal is to enhance building capacity of Indian Ocean Member States in Tsunami Early Warning chain, community response, and preparedness. In particular, the main activities are undertaken in Stock taking survey, Training/Workshop on effective tsunami preparedness, response, and mitigation, and Development of Indian Ocean Tsunami educational preparedness and awareness raising material.

Preserving Past Tsunamis Information for Future Preparedness
The programme aimed to increase official and public awareness of tsunami hazards in Indian Ocean countries by collecting and publishing government documents, newspaper reports, and eyewitness accounts of past tsunami events. Through this information, the educational booklet and videos for future tsunami preparedness were completed.

Indian Ocean Tsunami Ready and TEMPP
Indian Ocean Tsunami Ready is a community recognition programme that promotes tsunami hazard preparedness as an active collaboration of national and local emergency management agencies, community leaders, and the public. The objective of this program is to strengthen coastal community preparedness for tsunami emergencies and to minimize the loss of life and property. This programme is supported by TEMPP (Tsunami Evacuation Maps, Plans, and Procedures).
International Hydrological Programme (IHP) in Asia and the Pacific

Introduction
Established in 1975, the International Hydrological Programme (IHP) is an intergovernmental programme dedicated to water research, water resources management, education, and capacity building. IHP is implemented through a series of thematic phases and is currently in its eighth phase (IHP-VIII) covering the period 2014–2021.

Representatives of the IHP community in Asia and the Pacific have over the past 27 years regularly engaged in joint work and shared information relating to IHP’s thematic priorities through the IHP Regional Steering Committee for Asia and the Pacific (IHP-RSC). Hosting the Secretariat of this regional community, the UNESCO Jakarta Office supports the advancement and implementation of IHP across the region, devoted to securing the availability and sustainable management of water and sanitation for all and to mobilizing the hydrological sciences to address the impacts of climate change.

Water and climate change in the Asia and the Pacific Region
Climate change impacts the water cycle, causing the intensification of extreme events and disasters associated with flood and drought. UNOCHA (UN Office for the Coordination of Humanitarian Affairs) reported that the floods in 2018 affected 11.3 million people in 18 countries across Asia including Myanmar, India, and DPR Korea. Conversely, more than two-thirds of Afghanistan were affected by drought, its impacts exacerbated by years of conflict.

Climate change impacts the availability of freshwater. For example, rising sea levels acting in conjunction with human activity exposed coastal aquifers to saline intrusion. Increasing salinity may also impact water infrastructure, causing corrosion pipelines and other key elements. Such problems are increasingly felt by countries across Asia and the Pacific region from Bangladesh to Indonesia.

Water, climate change, and climate variability interact with human activity resulting in complex and multi-dimensional impacts. In Mongolia, the recurring phenomenon known as “dzud” – summer drought followed by severe winter – regularly causes large numbers of livestock to die. Decomposition of the carcasses leads to contamination of groundwater posing an additional risk to human health. Since these water-related challenges and problems are influenced by climate change, building capacities for climate change adaptation is essential, not only for governments but for individuals as well.

What has been Done and Contributions towards SDG and Climate Change

Increased capacity to ensure water security through scientific networking in Asia and the Pacific
The project strengthens UNESCO Water Family networks and supports new and innovative regional publication as well as appropriate water policies, practices, and education. Through professional networks such as IFI (The International Flood Initiative), IDI (The international Drought Initiative), Ecohydrology, HELP and AP FRIEND, water scientists and decision-makers are empowered to develop, share, and upscale the new and innovative practices in the hydrological science and water resources management. The activity emphasizes interregional exchange, in particular between Asia and the Pacific and Africa. Partnerships between UNESCO Category 2 Centres in the two regions in areas such as IWRM and ecohydrology are developed and expanded.

Good governance for the Sustainable Development Goals: Mobilizing UNESCO’s water & environmental science networks for the 2030 Agenda
This newly launched project aims to accelerate the implementation of good governance and management principles for freshwater and biodiversity resources in Asia and the Pacific. It supports the documentation of decisions, programmes, and activities of IHP Regional Steering Committee for Asia and the Pacific and the Southeast Asian Biosphere Reserves Network (SEABRNet) and its sister NAB networks in the region with clearly identified good governance and sustainability objectives and outputs at the regional level. Furthermore, capacities and knowledge for sustainable governance of UNESCO-designated sites among key stakeholders and decision-makers are enhanced through not only the establishment and dissemination of two supplementary compendia on natural resource governance at UNESCO-designated sites, but also the pilot research projects, knowledge transfer, and capacity development activities.

IHP WISER in AP International Hydrological Programme Water Informatics for Sustainability and Enhanced Resilience in Asia and the Pacific
The project’s main purpose is to build capacity for water-related disaster mitigation and policy recommendations by strengthening the availability, accessibility, and dissemination of hydro-informatics tools and concepts for sustainable and enhanced resilience of flooding, droughts, and climate change in Asia and the Pacific region. Particular focus is placed on policy recommendations for water-related disaster risk management should focus on anticipating and minimizing the negative impacts of water-related disasters.

Upscaling Water Security to Meet Local, Regional, and Global Challenges
To provide solutions to the global water challenges today, the project seeks to upscale existing local approaches and knowledge of the interrelations between environmental conditions and water. It is implemented through a research component, an education component, and water management component. Among the project’s key outcomes is a three-volume water management curriculum focusing on ecohydrology and integrated water resources management. Prepared by the Hurundi Tropics Centre Kuala Lumpur, a new version of the curriculum tailored for the African context is currently under development, coordinated by UNESCO Jakarta Office with contributions from UNESCO Category 2 Water Centres in Asia and Africa.

Strengthening responses to water security challenges in Asia and the Pacific: Achieving water related SDG targets
The activity builds capacity not only to support, promote, and provide technical assistance for the development of inter- and trans-disciplinary demonstration sites but also to improve the understanding of the interlinkages among ecohydrological processes at the catchment scale. In this way, it responds to the urgent need to promote new concepts of development that allow harmonization of environmental health and social needs and addresses the application of innovative and integrated approaches to regional priorities consistent with the theme of IHP-VIII, including ecohydrology and water-related disasters as well as the impacts of climate change on groundwater, water scarcity and quality, and urban water management issues.
Introduction

Launched in 1971, UNESCO's Man and the Biosphere (MAB) Programme aims to establish a scientific basis for the improvement of relationships between people and the environment. In Asia and the Pacific, UNESCO Jakarta hosts the secretariat of the Southeast Asia Biosphere Reserve Network and provides support to UNESCO’s field network and Member States through the region with focus conserving biodiversity, restoring and enhancing ecosystem services, and fostering the sustainable use of natural resources in line with the MAB Strategy 2015-2025 and the Lima Action Plan 2016-2025. The MAB Programme contributed particularly towards SDG 12 (Climate Action), 15 (Life on Land), 16 (Peace, Justice and Strong Institutions), and 17 (Partnership for the Goals) as well as other goals by supporting national and site-level programme and activities as well as sharing knowledge and experience through subregional and regional networks.

Climate Change and MAB

Biosphere reserves preserve and protect the environment by enhancing ecosystem and human resilience which in turn enables the rapid recovery and restoration of biosphere reserve in post-disaster scenarios. Contributing to the climate change knowledge base, MAB reserves are positioned as reservoirs of knowledge and tools of climate change. Through diverse monitoring procedures and evaluation of observed changes within the region’s biosphere reserves, MAB is ideally positioned to contribute to global research efforts by measuring the diversity of climate change impacts on nature and society across its regional array of biosphere reserves.

What contributions has been made towards implementing SDG?

With the support from Japan and Indonesia Funds-in-Trust mechanisms, a wide range of UNESCO Jakarta MAB-related projects have made significant progress and milestones in recent years:

- The 50th session of the Man and the Biosphere Programme International Coordinating Council (MAB-ICC), usually referred to as the MAB Council or ICC, was held in Palembang, South Sumatra Province, Indonesia from 23 to 28 July 2018. MAB-ICC guides and supervises the MAB Programme by reviewing the progress made in the implementation of the Programme; recommending research projects to countries and making proposals on the organization of regional or international cooperation and assessing priorities among projects and MAB activities in general.
- 24 new Biosphere Reserves – including 10 in Asia and the Pacific – were approved during the 50th session. From the coastal forests of Sumatra to the mountains of Kazakhstan, the 24 new Biosphere Reserves in Asia and the Pacific make a significant contribution to the region’s engagement with the MAB programme and to the sustainable future of the region’s people and nature.
- The 31st session of the Man and the Biosphere Programme International Coordinating Council (MAB-ICC) was held in Paris, France from 17-21 June 2019. During the session, 18 new biosphere reserves were established in 12 countries, including two in Indonesia. Thus, currently there are 781 Biosphere Reserves in 124 nations in the world.

- Publication (2019) of three guidelines documents prepared at the request of the Asia-Pacific Biosphere Reserves Network in 2014 and comprising a framework for biosphere reserve management informed by sustainability science, guidelines for applying eco-labelling in biosphere reserves, and a study on the legal aspects of biosphere reserve zonation.
- Organization of annual meetings of the Southeast Asian Biosphere Reserves Network (SeABResNet) in Jakarta (2017), Chiang Mai, Thailand (2018) and Legazpi, the Philippines (2019) serving to explore, devise and advance the potential of biosphere reserves as sites at which the SDGs are implemented in practice. SeABResNet allows for the sharing of experiences within and among MAB’s sub-regional networks in order to focus and enhance the contributions of Biosphere Reserves to the SDG Agenda and the SDGs. SeABResNet meetings also include sessions of the Asia Pacific Biosphere Reserves Network (APBRN), an umbrella network bringing together members of the region’s four sub-regional MAB networks.
- Publication of the Yokohama Recommendations in MAB-ICC for Strengthening the Roles of Local Governments in Implementing the Lima Action Plan (2016) for the following areas: governance and local governments’ platform, natural resources management and sustainability, green economies and green jobs.

Selected MAB-related projects in Asia and the Pacific implemented by UNESCO Regional Science Bureau for Asia and the Pacific during 2017-2019

- Good Governance for the Sustainable Development Goals: mobilizing UNESCO’s water and environmental science networks for the 2030 Agenda (2019-2021, funded by JFIT). Through this newly-initiated JFIT project, UNESCO Office Jakarta will:
  - Support the documentation of decisions, programmes and activities of HIP Regional Steering Committee for Asia and the Pacific (RSC-AP) and the Southeast Asian Biosphere Reserve Network (SeABResNet) with clearly identified good governance and sustainability objectives and outputs at the regional level.
  - Enhance capacities and knowledge about sustainable governance of UNESCO-designated sites among key stakeholders and decision makers achieved through pilot research projects, knowledge transfer, capacity development activities and the production and dissemination of two complementary compendia on natural resource governance at UNESCO-designated sites with particular reference to the Lima Action Plan.
  - Developing UNESCO-designated sites as learning areas for sustainable development in Asia and the Pacific.
  - Through the Regular Programme, UNESCO Office Jakarta provides backstopping and support to the UNESCO field network in Asia and the Pacific in support of MAB and the World Network of Biosphere Reserves in the region. Key initiatives include support for networking and training activities of the South and Central Asia Biosphere Reserve Network, capacity building for biosphere reserves in Central Asia, and community research and planning initiatives in the Ulwe Biosphere Reserve in the Federated States of Micronesia.
  - UNESCO Office Jakarta and UN ECC-LEARN UNITAR organized the ‘Youth Camp to Enhance Communication Skills in Promoting Climate Change Actions in Indonesia’ in 2017, with second phase of the project due to begin during the second half of 2019. The 2017 programme was carried out within the second phase of the UN CC Learn Project to Strengthen Human Resources, Learning and Skills Development to Address Climate Change, financially supported by the Swiss Government and UN Partners, and supported the implementation of the National Learning Strategy of Indonesia. The main objectives of this programme were:
    - Increase the knowledge of youth participants on climate change and biosphere reserves as well as increase the visibility of biosphere reserve sites.
    - Provide communication techniques on climate issues.
    - Improve the digital creative skills and its integration with social media of youth participants.
    - Promote climate change awareness and education for youth in Indonesia. It was carried at.
    - Enhance communication skills of youth in promoting climate change actions by optimizing the use of social media and digital narratives as tools for communication campaigns.
  - Biosphere Reserves Interconnected in Diverse Global Environments for Sustainability in Asia and the Pacific: BRIDGES in AP (March 2016 – September 2019, funded by JFIT). The specific objectives of the project were to:
    - Improve BR management with a standard framework based on sustainability science concept to ensure sustainable economic and social development of the BR based on case studies.
    - Secure BR economic and social development through eco-tourism and eco-labelling.
    - Facilitate BR zonation legal processes by sharing implementation laws and practices from case studies.
    - Promotes sustainable economic and social development across the region by strengthening management of biosphere reserves through the application of sustainability science.
    - Activities include expert group to define a sustainability science-based framework for biosphere reserve management, eco-labelling guidelines for biosphere reserves and comparative case study BR zonation.
Malaysia - UNESCO Cooperation Programme

Introduction

Since the Malaysia-UNESCO Funds-in-Trust’s (MFIT) inception in 2009, the Government of Malaysia has provided financial and technical support in the implementation of projects according to the UNESCO’s major programme, aiming at empowering South-South Cooperation (SSC).

Activities

The MUCP-MFIT framework heavily applies on:

- Empowering mutual learning and knowledge platform.
- Enhancing capacity-building.
- Contributing to policy development and linkage.
- Strengthening expertise networking.

Strategic Focus

- Emphasized on joint-cooperation with countries from the Asia and the Pacific, Small Island Developing States (SIDS), Least Developed Countries (LDCs), and Africa.
- Supporting the UNESCO’s agenda global priorities: Africa and Gender Equality.

Projects on Natural Sciences

Science Harmed for ASEAN Regional Policy (SHARP)

Overall objectives:

1. Showcasing and synthesizing best environmental management principles and practices through sites in the ASEAN member states to demonstrate rational science principles and applications with a clear pathway to regional science policy.
2. Promotion of ASEAN-UNESCO environmental science policy networks for harnessing science for peace, sustainability and social inclusion in ASEAN science policies by addressing the impacts of climate change on natural resources.

Fostering Tsunami Preparedness, Response, and Mitigation in the Indian Ocean Small Island Developing States and Developing Countries

Overall objectives:

Strengthen the capacity of Indian Ocean Member States in tsunami preparedness, response and mitigation.

Upscaling Water Security to Meet Local, Regional, and Global Challenges

Overall objectives:

To provide solutions to the current global water challenges by upscaling existing local approaches and knowledge of the interrelations between environment conditions and the state of waters. This project will implement 3 components:

1. Research Component: Demonstration of ecohydrology biotechnologies.
2. Education Component: HELP and Ecohydrology training.
3. Water Management Component: Workshops on comparative studies of applying water footprints, Ecohydrology and IWRM in Asia and Africa through UNESCO category-2 water centres in Asia and Africa.

Towards Economic Resilience in the Pacific and Southeast Asia: Reducing Risk of Loss and Damage in the Tourism and Agricultural Sectors from Extreme and Slow-Onset Events through Improved Assessments and Education

Overall objectives:

1. Generate and share new knowledge and raise awareness on loss and damage caused by the adverse impacts of climate change.
2. Enhance tools and approaches to reduce loss and damage in the agriculture and tourism sectors in Pacific and Southeast Asian LDCs and SIDS.

South-South Cooperation for Enhancing Science, Engineering, and Technology Standards in Asia and the Pacific

Overall objectives:

1. Create a meta-knowledge on policy instruments and resources for SETI linkage of engineering, science, innovation and technology for human resource development to promote sustainable development concepts in Asia and Africa.
2. Develop curricula and guidelines for professional bodies, government departments and universities for certified training of authorities.
3. Mapping of UNESCO centres and chairs to establish South-South cooperation in SETI.

AP–FAST: Facility for Accelerating Science and Technology Knowledge Services for SDGs into National Development Plans in Asia and the Pacific

Overall objectives:

Positioning AP–FAST as a major driver for dialogue and actions to take forward science and technology knowledge and the SDGs in a region where political commitment and resource allocation is variable.
Science, Engineering, Technology, and Innovation (SETI) in Asia and the Pacific

Introduction
SETI is an essential tool, which combines systematic study and application of scientific knowledge into practice for implementation of the SDGs. It helps improve economic and environmental efficiency, developing new and more sustainable ways to satisfy human needs, and empowering people to drive their own future. In Asia and the Pacific area, implementation of SETI contributes to the achievement of SDG 5, 6, 11, 13, 14, 15, and 17.

This contribution is delivered through activities such as workshops on SETI, strengthening local government policy on Ocean Policy, strengthening engineering qualification and standardization frameworks, strengthening interaction and knowledge exchange between UNESCO Science Centre and Chairs, implementing science education in school curriculum, and piloting country project on specific SETI approach.

UNESCO SETI Projects in Asia and the Pacific

South-South Cooperation for Enhancing Science, Engineering and Technology Standards in AP and Africa (July 2014 - March 2019) (Funded by MIFIT)
- Funded by the Government of Malaysia, the project was implemented to strengthen engineering qualification, standardization, interaction, and knowledge exchange among UNESCO Science Centres, Chairs and other partners.
- Project activities included workshops on engineering and standardization, development of modular curricula for certified training of professionals; mapping of UNESCO Centres and Chairs; and the establishment of a knowledge platform on Science, Engineering, Technology, and Innovation (SETI) human resource development for sustainable development through the online platform ConnectAsia.

AP-FAST: Facility for Accelerating Science and Technology Knowledge Services for SDGs into National Development Plans in Asia and the Pacific (June 2017 - Ongoing) (Funded by MIFIT)
- Launched on June 2017 and funded by the Government of Malaysia, AP-FAST addresses Science, Engineering & Technology Innovation needs in Asia and the Pacific region for cost-effective implementation of SDG Agenda SDGs and related targets.
- Through active UNESCO Science Family networks, the project offers a knowledge-sharing service in order to promote scientific collaboration and development on a national and regional level.
- Activities include:
  - Regional meetings on the implementation of SDGs to analyze the incorporation of the targets of the SDGs into national development plans in Asia and the Pacific;
  - Identification of effective and inclusive means for the use of Science & Technology knowledge for implementing a transformational development agenda at the national and regional levels in pilot countries;
  - Defined an AP-FAST annual meeting model as a regional forum to discuss processes and progress for the integration of SDGs in national development plans in the region.

SETI for DRR in Asia and Pacific (2017 - Ongoing)
- As a contribution towards global commitments and goals and guided by its internal mandate and priorities, UNESCO Jakarta implements and supports SETI for DRR initiatives across the region.
- Initiatives include:
  - Flood technology and DRR, strategic strengthening of flood warning and management capacity in Pakistan.
  - Delivery of VISUS - a multi-hazard school safety assessment and tools through science-based information in Indonesia.
  - Mobile applications TANAH and SAIFAH, offering platform-based games with various levels and users and providing key survival lessons for all phases of disasters in an interactive manner throughout the region.
  - Marine hazards (tsunami) reduction through cooperation with IOC and Member States focusing on sustainable tsunami early warning and mitigation system development.

Comprehensive Programme to Enhance Technology, Engineering and Science Education in Asia and the Pacific (March 2016 – January 2019) (Funded by JFIT)
- Funded by the Government of Japan, the project aimed to harness science, engineering and technology as ways to equip individuals and communities with the knowledge, skills and attitudes to live, work and act towards an overall framework of sustainable development.

Biotechnology School in Asia (October 2011 – April 2018) (Funded by JFIT)
- Launched in October 2012, the UNESCO Biotechnology School in Asia offered a Master’s program in biotechnology, implemented through the international collaboration between 22 universities from four ASEAN member states: Thailand, Indonesia, the Philippines and Vietnam, under the mentoring of Japan.
- The purpose of the project was to establish an international graduate programme in biotechnology for talented individuals from less-developed countries in Asia and the Pacific as well as to increase the ability of countries in the region to accept and educate students from other less-developed countries.
Japanese Funds-in-Trust in Science for Asia and the Pacific Region and Regional Bureau’s Support strategy for synergies

Asia and the Pacific has achieved remarkable Funds-in-Trust partnerships with Member States in the region play a significant part in supporting the Bureau’s delivery of a comprehensive scientific contribution towards the 2030 Agenda and the SDGs. Japanese Funds-in-Trist (JFIT) programmes have leveraged the resources, expertise and competences to form a solid foundation of existing international science programmes and relevant networks of UNESCO family. JFIT programmes should be further designed as a delivery platform for the implementation of the 2030 agenda and SDGs through science-based solutions and science services to society by mobilizing, engaging and strengthening Japanese as well as regional expertise and know-how.
Key directions for JFIT programmes


2. South-South-North collaboration and establishment of stronger partnerships

3. Improved programme effectiveness (coordinator, aiming at co-financing modalities, aim at development of larger projects/programmes) by mainstreaming, capitalizing and expanding UNESCO Family (Chairs, Category 2 Centres) existing networks established by JFIT.

4. Improving the communication and visibility of activities and results to donors, Member States, and the larger public.

5. Supporting Members states in the Asia-Pacific region to deliver SDGs and realise 2030 Agenda in line with UNESCO Agenda 2030 strategy.

6. Supporting synergies among the different Natural Sciences programmes for cost-effectiveness, result-based management, visibility and impact.

The Regional Bureau’s strategy for synergies

Vertical Collaboration and Harmonization with the UN presence

The Regional Science Bureau will continue to strengthen collaboration among Field Offices and Headquarters as well as with regional science stakeholders including with UN regional coordination mechanisms to implement coherent programme. We lead the implementation of regional strategies and provide backstopping to programme implementation at country level. Delivering as One approach is a key for harmonization with other UN agencies. In regional level, the office strives to increase inter-agency efforts through participation and contribution to regional UNDGs. We ensure all projects are in line with United Nations Development Assistance Framework (UNDAF) and national leadership with effective contribution to the United Nations Country Team (UNCT) led by Resident Coordinator.
Subjects and intra/inter-sectorality

A holistic and integrative approach will be taken to create synergies among UNESCO programmes. Intergovernmental programmes such as MAB, IHP and IGGP, disaster risk reduction (DRR) and science policy can gain efficiencies by utilizing all aspects of the UNESCO designated sites networks. Capacity-building and promotion will be linked with UNESCO designated sites in a common approach, across a range of modalities from case studies to policy advice. Such an approach was successfully applied with the collaborative work with Social and Human Sciences (SHS) on Sustainability Science. Efforts of the IOC and DRR will be concentrated with a focus on inter-sectoral coastal hazards in SIDS, local and indigenous knowledge systems (LINKS) and climate change as stressed in the 39C/5. UNESCO’s work in science policy and its science networks can be mobilised to promote and popularise science and STEM education collaboratively with UNESCO Bangkok Office, the regional bureau for Education in Asia and the Pacific as well as other regions and mainstream science services for society.

Synergy among programmes will be enhanced by focusing on the two areas below:

- Networking - fostering and enhancing UNESCO Water, Environment, SETI, DRR and IOC networks in the Asia-Pacific Region.
- Synergies among programmes - Effective synergy to be built around the Science networks and groups and UNESCO sites network. Potential benefits of synergy are listed in Annex 1 and Annex 2.

Develop Financial and Non-Financial Partnerships for Science Activities

In the coming years, the Bureau will address the financial challenges by ensuring that activities are cost-effective and strengthening development efforts that will build long-term partnerships with governments, bilateral agencies, the private sector, and foundations. Recent practice in gaining synergies among funding sources which will continue to be pursued are: 1) Funds-in-Trust co-financing, 2) Government co-financing, 3) Private sector co-financing. 1) utilizes multiple Funds-in-Trust (JFIT, MFIT, IFIT) to support single activity, 2) utilize kind/in-kind supports from host-government of the meeting, 3) utilizes funds from private sector in combination with other funds.
Science to Enable and Empower Asia Pacific for SDGs 2
(SEE AP for SDGs 2)

16 – 19 September 2019
Jakarta, Indonesia

Vision
To enable and empower the UNESCO Science Family in Asia and the Pacific to deliver science-based policy coherent systems solutions for SDGs, the Sendai Framework for Disaster Risk Reduction and the Paris Agreement on climate change for a transformed region, UNESCO Jakarta will organize a regional science coordination meeting as a follow-up of the Natural Science Sector Retreat held in UNESCO Headquarter in June 2019.
Rationale

2019 is the last year of the first SDGs cycle. In Asia and the Pacific, great strides have been made towards the realization of the 2030 Agenda in reducing poverty, increasing technological development, and growing resilient economy. However, rising inequality greatly hinders this sustainable development process – compounded by environmental degradation and an increasing incidence of disaster events. To achieve the 2030 Agenda, the most ambitious and far-reaching global agenda in history, UNESCO and its development partners must further strengthen their cooperation and contribution. This year’s Science Retreat serves as a platform to scope joint projects, priorities, and future vision with improved efficiency - and to further inter-disciplinary collaboration among the wider UNESCO science community.

The 2019 Science Retreat will place particular focus on SDG13 “Take urgent action to combat climate change and its impacts”, SDG 16 “Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels” and SDG 17 “Strengthen the means of implementation and revitalize the global partnership for sustainable development”, as well as SDG 9, 14, and 15. SDG 13, 16, and 17 are among the six undergoing review by the High Level Political Forum this year – and are essential, complementary mechanisms through which to address the impacts of climate change.

Climate change is already impacting the region and will do so with increasing severity in the coming years - through higher temperatures, sea level rise, and increased variability and extreme weather events. According to World Bank study, more than 100 million people - many in the region - may be forced into extreme poverty by 2030 without adaptation and mitigation action. All scientific disciplines and their corresponding UNESCO programmes - fresh water, environment, disaster risk reduction, geo-science, engineering, ocean, science policy and education – must, along with other UNESCO major programmes, enhance cooperation in order to build comprehensive regional capacity for climate action. Efficient inter-programme information sharing has the potential to trigger new synergies among programmes and unlock unique advantages through multi-disciplinary activities. By utilizing this advantage, UNESCO and its science networks have the potential to reclaim and reinforce their status as key global science convenors and leaders.

To achieve this, the UNESCO science family in the region must strengthen north-south, south-south, international and regional partnerships. We must continue our research efforts, share good practices, and promote scaling-up of best practices. UNESCO and its networks must review their role in providing support to the least developed countries (LDCs) and the small island developing states (SIDS), as well as empowering youth. In addition, it is increasingly important to mainstream the science agenda with national development commitments, function as One UN, and improve partnerships with public and private stakeholders. In order to better communicate these intentions outside of UNESCO and its networks, we need to be aware of and transmit our regional assets, priorities, and vision.
Past Regional Science Coordination meetings have contributed to improved efficiency in project implementation among UNESCO science stakeholders. The first meeting (Fostering Collaboration between UNESCO in the Field and Networks towards the Agenda 2030, 21-24 July 2016, Bali, Indonesia) introduced UNESCO mechanisms for different stakeholders to work together, while the second meeting (SEE-AP, 2018, Jakarta, Indonesia) focused on discussing and developing collaborative project concepts at different levels across the region. Taking its point of departure in these successful events, this year’s Science Retreat will focus interactions on climate change (SDG13), an area that demands our urgent attention and requires us to work across thematic, disciplinary, institutional and geographical boundaries, and its linkages with other SDGs. This will require strengthening of multi-sectoral collaboration beyond the Natural Sciences family, involving all of UNESCO’s major programmes – Culture, Education, Social and Human Sciences, and Communication and Information.

The Science Retreat is not only a forum for information sharing but rather a forward-looking forum to renew our priority and vision, explore and generate new collaboration, and share and integrate our joint efforts with the wider science community in the region. As a Regional Bureau of Science for Asia and the Pacific, UNESCO Jakarta will prioritize the maintenance of this convening platform; and bring integrated policy recommendations to the fore in coordination with UNESCO field offices and science stakeholders. The results of the workshop will also provide context to United Nations Common Country Analysis exercises and support the new Resident Coordinators system as well as other development organizations towards achieving efficient programme and project implementation particularly in Indonesia.

**Objectives**

This UNESCO strategic coordination event aims to:

1. Review and prioritize science (SC) actions for the implementation of the SDG 9, 13, 14, 15, 16, and 17 and other international commitments;

2. Devise strategies and modalities for UNESCO’s science programmes in Asia and the Pacific to serve as efficient delivery platforms for the implementation of the 2030 Agenda and the SDGs;

3. Enhance dialogue, cooperation, networking and sharing of knowledge and resources among the UNESCO field offices and networks in support of the 2030 Agenda and the SDGs; and

4. Support interdisciplinary across SDG initiatives through joint regional action.
Participants

Relevant stakeholders under categories below are invited as participants.

1. UNESCO Natural Sciences Senior Managers and Programme Specialists.

2. Government Representatives and other key stakeholders from UNESCO’s networks taking initiatives to accelerate the implementation of SDG, in particular SDG 13 and 17.

3. UNESCO Natural Sciences Category 2 Centres and Chairs.

4. UNESCO Jakarta Sciences project related partners in the region.

Venue

The meeting will take place in:

**Grandkemang Hotel**

Jl. Kemang Raya 2H, Jakarta 12730
Indonesia

https://grandkemang.com/

Language

The meeting presentations, printed materials and the field trip will be conducted in English.
Field Trip

On Thursday, 19 September, the participants will take a field trip to visit the Pramuka islands. Pramuka Island is an island in the Thousand Islands archipelago. The archipelago lies in the western part of the Java Sea and is located north of Indonesia’s capital Jakarta. The island is the capital and the home to the administrative government of the Thousands Island regency. In Pramuka Island located Kepulauan Seribu National Park (Taman Nasional Kepulauan Seribu) where we can visit the mangrove conservation and sea turtle sanctuary center.

19 September 2019 DAY 3: Field Trip

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>6:30</td>
<td>Meeting at the hotel lobby, boarding bus</td>
</tr>
<tr>
<td>7:00</td>
<td>Depart from Grand Kemang Hotel</td>
</tr>
<tr>
<td>8:30</td>
<td>Depart from Marina Ancol heading to Pramuka island</td>
</tr>
<tr>
<td>10:00</td>
<td>Group Activities</td>
</tr>
<tr>
<td>13:00</td>
<td>Lunch at Nusa Resto</td>
</tr>
<tr>
<td>14:00</td>
<td>Testimony/participants impression</td>
</tr>
<tr>
<td>15:00</td>
<td>Depart from island heading to Marina Ancol</td>
</tr>
<tr>
<td>16:45</td>
<td>Heading to GrandKemang hotel</td>
</tr>
</tbody>
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Tentative Programme

16 September 2019 - Internal UNESCO meeting - at Allura 1 room

14.00 – 16.00 UNESCO Team briefing and networking meeting
19.00 – 21.00 Internal Dinner at Sperta Restaurant

17 September 2019  Day 1: Setting the Scene - at Magzi Ball room

8:00 – 9:00 Registration
9:00 – 10:00 Opening Session
10:00 – 10:45 Panel discussion
10:45 – 11:15 Coffee Break and Poster Exhibition
11:15 – 11:45 Ice Break
11:45 – 12:00 Key Note
12:00 – 12:45 Thematic Session 1: Recap of the Global Science Retreat – Opportunities and Areas for Action
12:45 – 13:45 Lunch
13:45 – 14:30 Thematic Session 2: Strengthened Partnerships and Networks for related SDGs
14:30 – 15:15 Thematic Session 3: Open Science and Public Mobilization
15:15 – 15:45 Coffee Break and Poster Exhibition
15:45 – 18:00 World Café 1 : Identifying Regional Challenges, Assets, and Priorities in Thematic Places
18:00 – 19:00 Climate Action Night Club
19.00 – end Welcome Dinner at the pool side

18 September 2019  DAY 2: Proposal Development Workshop – at Magzi Ball room

9:00 – 10:00 Review: Impression from Day I and Achievements from Day 1
10:00 – 11:00 World Café 2: Brainstorming Inter-Disciplinary Collaborative Projects
11:00 – 11:15 Coffee Break and Poster Exhibition
11:15 – 12:00 World Café 2: Continue
12:00 – 13:00 Lunch
13:00 – 15:00 Sub-Group Discussions: Developing Joint Regional Projects
15:00 – 15:30 Coffee Break and Poster Exhibition
15:30 – 16:15 Poster Preparation of Joint Regional Projects
16:30 – 17:00 Synthesis for the Joint Regional Projects – Poster Presentation
17:00 – 17:45 Closing with Assistant Director General Science of UNESCO
18:00 – end Dinner at the Magzi Ball room

19 September 2019 DAY 3: Field Trip
Day Trip to Thousand Island – Pramuka Island
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