

BIO COURIER

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BIOTROP on The Verge of Global Connection

SEAMEO BIOTROP role as the center of excellence
in Tropical Biology through collaboration
initiation with various international entities

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April 2023

BIOTROP In Transition

By improving its management and operations, SEAMEO BIOTROP will expand its services and expertise in tropical biology and biodiversity conservation

Envisioning Regional Partnership on Education Toward ASEAN Presidency

Programs and activities of SEAMEO BIOTROP in envisioning ASEAN Presidency theme "ASEAN Matters: Epicentrum of Growth"



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Dear Readers,

Greetings from SEAMEO BIOTROP, Indonesia! I hope everyone is staying safe and healthy.

January 2023 marked the new normal and the new SEAMEO BIOTROP. The covid pandemic has been declared as endemic and therefore, a lot more activities can be carried out, especially field activities.

Along with the changes to the new normal era, many changes happen in SEAMEO BIOTROP to overcome the challenges and disruptions and establish solid connectivity with the international level.

The changes in our Center are mainly to improve the management of human resources and financial and facilities management optimization. These changes were the implications for the issuance of Ministerial Decrees of the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia regarding the host and home-based institution and the management of SEAMEO Center in Indonesia.

In envisioning regional partnership on education toward Indonesia as ASEAN Presidency, SEAMEO BIOTROP increases its collaboration with institutions in the ASEAN Countries in the field of tropical biology. The tagline "Save Biodiversity from Mountains to Oceans" is being implemented in every existing partnership. We also held many webinars to share thoughts, ideas, and experiences in sustainably conserving biodiversity and mitigating the adverse impact of climate change.

The implementation of Merdeka Belajar Kampus Merdeka, especially for the Certified Internship for University Students (MSIB), BIOTROP has received the second batch of students from various universities across Indonesia. The launching of the Spring Course in collaboration with Hiroshima University has also been among the highlighted program of our Center. SEAMEO BIOTROP also actively participates in the SEAMEO CPRN, emphasizing the interrelationship between biodiversity and environmental education.

We are now focusing our programs and activities to uplift the visibility of our institution. We are embracing each and every institution to set about the issues of climate change, biodiversity conservation, and sustainable usage of our natural resources.

Let's join hands to increase our awareness on any adverse changes in our environment, to save the Earth.

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SEAMEO BIOTROP, IPB University, and ICMI Plants 3500 Mangrove and 7 Rare Tree Species in Ketapang Urban Aquaculture

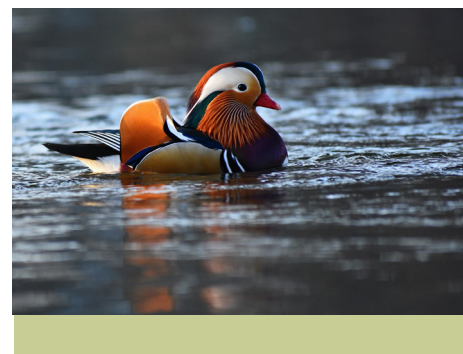
SEAMEO BIOTROP Started the Year with Dissemination of Featured Programs and Golden Tickets

SEAMEO BIOTROP Hosts Delegations from SNU and ICO IPB for Collaboration Discussion

Let's Visit Our Centre!

SEAMEO BIOTROP Collaborates with Mindanao State University for Regional Development

The most beautiful duck in the world



Keynote Remarks by the Secretary General

I would like to begin by acknowledging the significant progress we have made in promoting biodiversity conservation and sustainable development in accordance with Presidential Regulation No. 1 of 2023 on Mainstreaming Biodiversity Conservation in Sustainable Development, which serves as our guiding principle. The prioritization of environmental concerns in our research and independent studies is a testament to our commitment to the Blue Economy and Green Economy initiatives.

Through the implementation of these initiatives, we hope to achieve various goals. We aim to promote sustainable development through environmentally oriented programs such as research and independent studies. These programs will provide opportunities for our students to explore their talents and interests, allowing them to channel their passions into their learning experiences.

One such effort to drive educational transformation is the Merdeka Belajar Kampus Merdeka (MBKM) program. This program grants students the freedom to spend one to three semesters outside their regular study programs, gaining valuable real-world experiences. By exposing students to learning experiences beyond the confines of the campus, we equip them with the necessary skills and understanding of the actual working environment they will face.

The SEAMEO Center plays a crucial role in improving the quality of education and supporting the MSIB program and the Merdeka Belajar Kampus Merdeka initiative. With its mature experience and contributions in addressing human resources, environmental, and technological challenges, SEAMEO can significantly enhance our education system, allowing students to become self-directed learners and independent contributors in the workforce.

To ensure the success of these efforts, it is essential to establish a robust and well-integrated infrastructure. SEAMEO BIOTROP, as a supporting infrastructure, must be fully prepared, coherent, and integrated. Only then can its impact extend effectively to society.

In line with our commitment, the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia has issued Ministerial Decree No. 511/O/2022, designating the host institution and home base of SEAMEO Centres in Indonesia. This decree further solidifies our aspirations for SEAMEO BIOTROP and calls for greater collaboration and synergy in our endeavors. The BIO Courier magazine serves as a vital medium for disseminating information to our lecturers and students, particularly in realizing the Key Performance Indicators of Dikti (Ministry of Education, Culture, Research, and Technology) Numbers 2, 3, and 5.

I extend my gratitude to all those involved in the pursuit of biodiversity conservation and sustainable development. Let us continue to work together, intensifying our collaborative efforts and knowledge dissemination, ensuring a brighter and more sustainable future for our nation.

Prof. Tjitjik Sri Tjahjandarie, Ph.D

Acting Secretary for Directorate General of Higher Education, Research, and Technology
Ministry of Education, Culture, Research, and Technology
of Indonesia



Testimonials of BIOCourier

Dr Ethel Agnes Pascua-Valenzuela
Director of SEAMEO Secretariat for 2019 – 2023

Congratulations on the successful rebranding of BIOCourier! This is an exciting milestone for the Centre, and I commend you on your efforts to enhance biodiversity literacy in Southeast Asia. I look forward to reading your newly revamped newsletter and seeing more of the excellent research and insights into biodiversity conservation in the region that will be featured in its pages.



Dr Wahyudi
Director of SEAMEO SEAMOLEC

“Dear esteemed BIOTROP Team,
Congratulations on the launch of BIOCourier!
Your renewed focus on promoting biodiversity literacy and conservation is commendable. Publishing articles by internal and external authors on current challenges facing biodiversity will contribute to a sustainable future in Southeast Asia. We wish you great success and look forward to reading the insightful articles.”



Prof Dr Ir Marwan
Rector of Universitas Syiah Kuala

Southeast Asia is one of the world's most diverse regions in biodiversity, with enormous endemic species. However, the region faces significant challenges in preserving its biodiversity due to climate change, invasive species, and a lack of conservation efforts. I am happy that the new re-branding of BIOCourier has been released, and I hope it will provide us with the latest information about initiatives and events in preserving biodiversity.





BIOTROP on the Verge of Global Connection

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Disruption, Challenges, and Connectivity

Disruption is a long-term period of innovation that affects economic growth, social movements, and cultural fabric. Humans invent technology, which is then incorporated into new habits and behaviours. This involves accelerating communication access and massive information digitalization. Changes in behaviour in the millennial generation and other rapid and massive changes significantly impact future developments. Digitalization is the third industrial revolution that occurs in all aspects of society and is an essential component of the current development strategy. The existence of new technology can increase productivity and efficiency. However, excessive consumption of digital applications, especially in developed countries, can significantly increase the environmental impact. Based on the report by The Shift Project (2018), digitalization is responsible for pollution and environmental degradation around the world (Figure 1). In addition, ICTs are responsible for between 2.1% and 3.9% of GHG emissions, which will increase without intervention (Charlotte et al., 2021). To address the severe issues of climate change and environmental degradation, drastic changes in the energy, food, water, and transportation systems are required (Ripple et al., 2020).

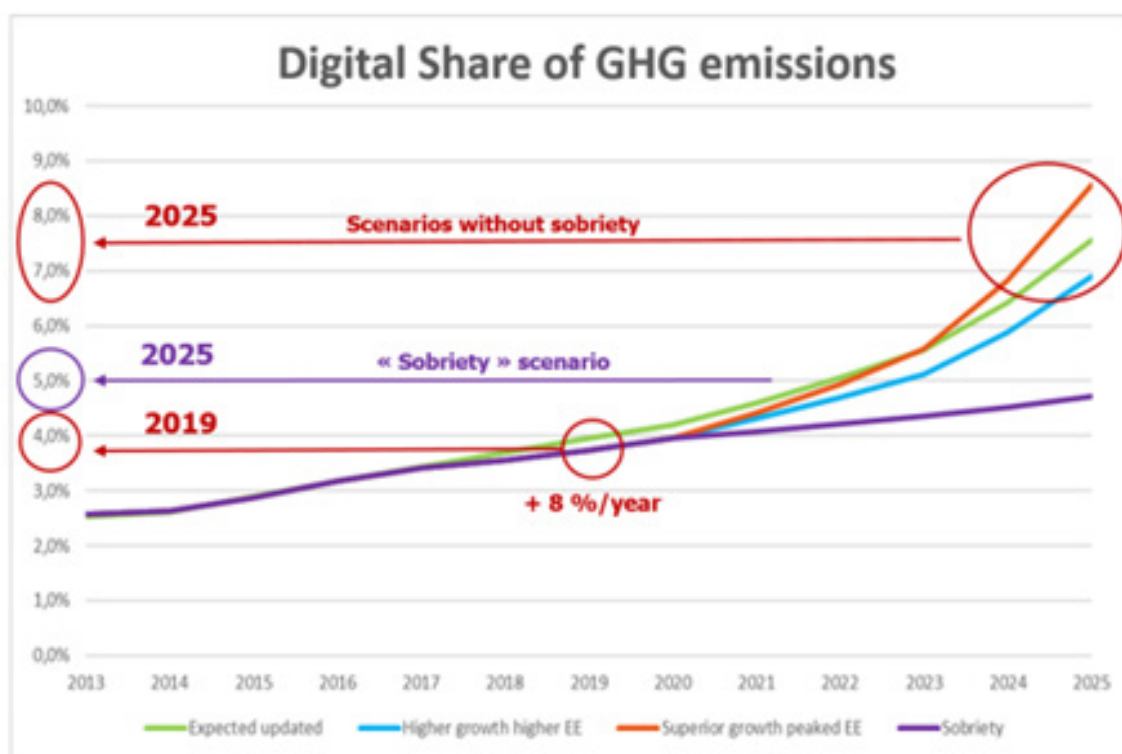


Figure 1. Evolution from 2013 to 2025 of the share of digital technology in world GHG emissions (The Shift Project, 2018)

Climate change and environmental degradation have a tangible impact on changes in biodiversity. Today, science and policy have responded to the need to address rates of change in biodiversity, drivers of these changes, and their functional consequences. Most notably, these efforts led to the formulation of Aichi's biodiversity targets under the Convention on Biological Diversity (CBD) umbrella, which aims to halt the further decline in biodiversity by 2020 (Tittensor et al., 2014). In addition, the post-2020 Global Biodiversity Framework has four long-term goals for 2050 related to Vision 2050 for Biodiversity. Each 2050 goal has several appropriate milestones to assess in 2030 and progress towards the 2050 goal (Figure 2). Biodiversity includes richness, namely the number of species and aspects of identity, dominance, and scarcity. Projecting biodiversity with estimated uncertainties under different climates, land use, and policy scenarios is essential for setting and achieving international targets for reducing biodiversity loss. With the potential for one million species to go extinct in the coming decades, developing better tools to project changes in biodiversity is critical, modellers have developed a series of biodiversity models and scenarios to predict changes in various dimensions of biodiversity (IPBES, 2016). The wealth of remote sensing, metagenomics, and citizen science data will help set scientifically informed targets for biodiversity conservation.

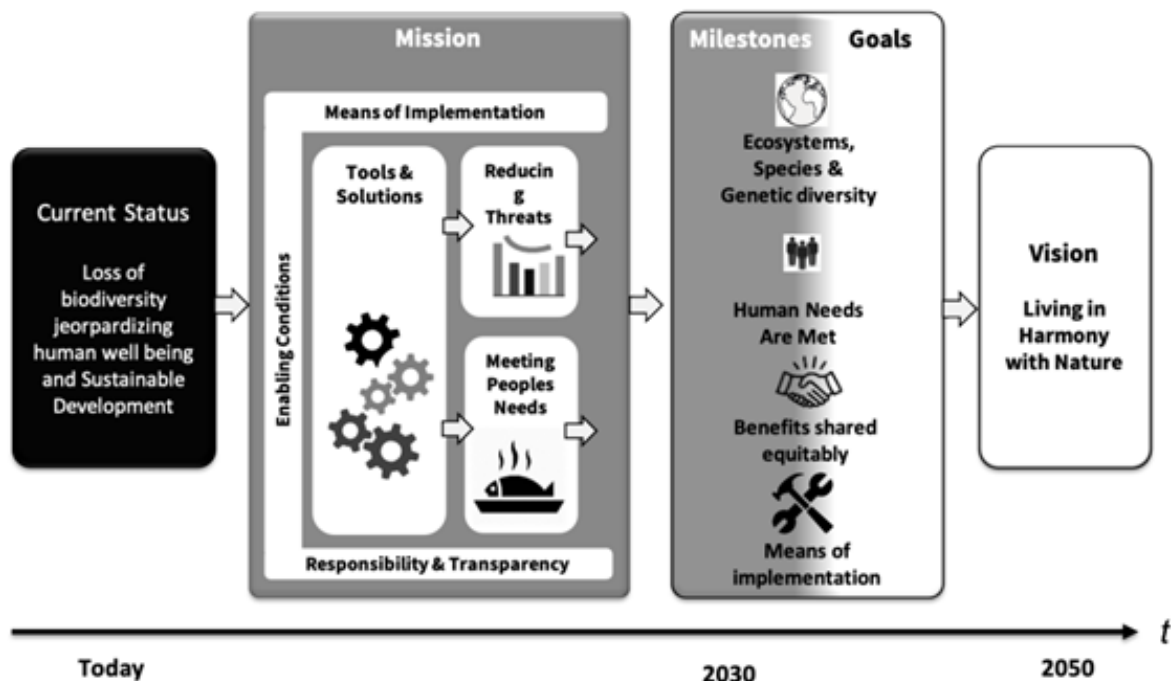


Figure 2. Theory of change of the post-2020 global Biodiversity Framework

The main obstacle, at least in the tropics, in addressing challenges related to biodiversity management is the lack of investment in biodiversity science that can build human capital and demonstrate the potential of biodiversity in 1) addressing climate change, natural disasters, stagnant agricultural productivity, water shortages, air pollution, and emerging infectious diseases; 2) improve human welfare; and 3) encourage future socio-economic development. Therefore, SEAMEO BIOTROP, as a regional center in tropical biology, always tries to contribute to saving biodiversity as an interconnection institution in various knowledge-sharing activities and acting as a knowledge industry and standardized information center in the field of tropical biology.

This article will discuss indicators, challenges, connectivity, and expectations in developing education in tropical biology and its relation to saving biodiversity. The implication in the field of science is to impact the contribution of biodiversity to science. The managerial importance is biodiversity management, which considers various aspects, including the relationship between biodiversity and human welfare.

Biodiversity Science and Global Connection

Biodiversity is a dynamic system that is constantly evolving, both based on species and organisms. Each species reveals something about how life originated and will develop in the future and helps in understanding how life functions and the role each species plays in supporting the ecosystems of which humans are a part. Traditional scientific approaches can no longer address and resolve the biodiversity crisis. Because human activities strongly influence changes in biodiversity, it must combine research in the natural and social sciences. Biodiversity science is thus a multi-disciplinary field using tools and theories from molecular biology, taxonomy, genetics, traditional ecological knowledge, political science, ecoinformatics, economics, and ecology.

Research framework of biodiversity science integrating different political and scientific fields to tackle the continuously evolving threats to biodiversity better. A better understanding of the cause and maintenance of biodiversity will allow a better prediction of its response to human activities. To engage people in biodiversity and other environmental issues, one must provide the opportunity for enhanced understanding that empowers individuals to make choices and take action based on sound science and reliable recommendations. Educational programming, media, exhibitions, and other means of public outreach should build on the welcome increase in public interest in saving biodiversity.

The tropical rainforest is one of the most critical ecosystems with a diverse biodiversity. The main problem in tropical rainforests that has an impact on the loss of biodiversity and can affect human life is deforestation. Tackling deforestation is an essential step towards achieving the Paris climate goals through the following global actions: the Race to Zero, which the United Nations support, and the Glasgow Financial Alliance on Net Zero (GFANZ) as well as featuring Global Biodiversity Work. Global support through financing for biodiversity restoration is also very high. Current estimates of global living forest conservation financing of US\$ 124–143 billion per year broadly align with other recently published estimates by Deutz A, et al. (2020) (Figure 3). In addition, various innovations in the field of biodiversity are also being developed, including living coastlines, the Big Green Wall Initiative, frozen arks, Terra-I, Bioacoustics, BioCarbon Engineering, Biomimicry, and Descartes' laboratory.

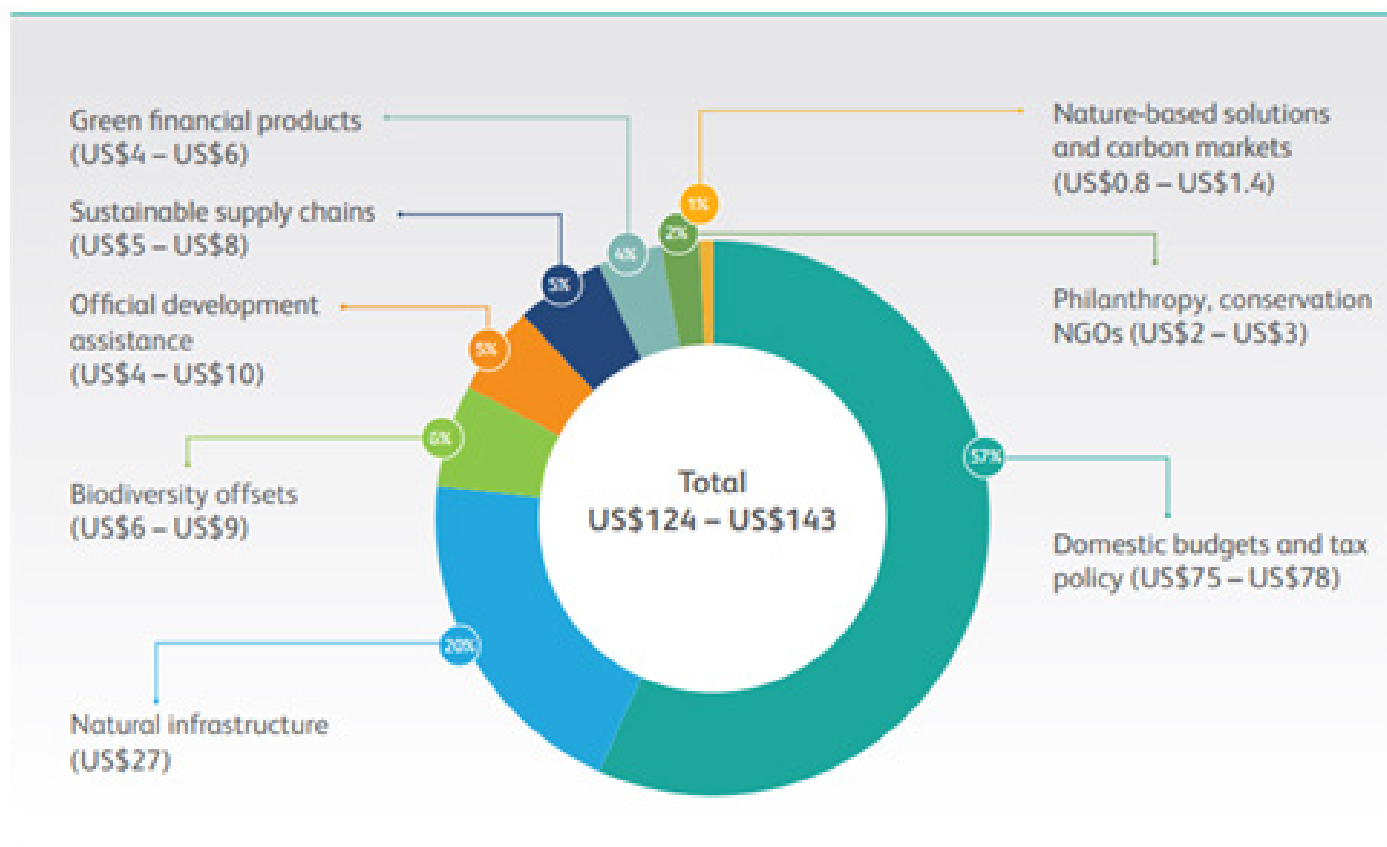


Figure 3. Global biodiversity conservation financing in 2019: Summary of financial flows into biodiversity conservation. (in 2019 US\$ billions per year)

On a regional scale, SEAMEO BIOTROP has a good opportunity to become a center of excellence in Tropical Biology. SEAMEO BIOTROP is an international organization with a network and representatives throughout Southeast Asian countries and Associate Members in several European, Australian, and Asian countries that can support and enhance visibility, as well as bilateral and multilateral cooperation in biodiversity protection in tropical biology. The existence of these modalities encourages SEAMEO BIOTROP to have wider opportunities in utilizing potential funding, conducting research, developing technology, and improving the quality of education to save biodiversity, especially in tropical regions. The modality owned by SEAMEO BIOTROP currently needs to be strengthened by government support for SEAMEO BIOTROP's flagship programs and encouragement to strengthen the active participation of associate members in several European, Australian, and Asian countries.

Design Action and Movement

The tropics are the most diverse region on Earth, containing approximately 80% of all terrestrial species and more than 95% of all corals and mangroves. Diverse and healthy natural ecosystems provide essential life benefits, human well-being, and prosperity. Many other economic, cultural, and recreational activities depend on biodiversity. However, without realizing it, the loss of biodiversity increases along with changes in behaviour and developments in how humans use it. So, it is necessary to do conservation to maintain the sustainability of biodiversity. Conservation requires methods to identify species and locate and track individual plants and animals. Furthermore, despite the growing impact of human activities on the environment, societal knowledge of biodiversity remains fragmented. As a result, biodiversity science and education are critical for biodiversity's long-term use and conservation. It is also essential to include biodiversity.

Many conservation efforts have been made to reduce the loss of biodiversity. On a global scale, this issue has become a global political agenda resulting in the adoption of several multilateral environmental agreements, such as the United Nations Convention on Biological Diversity (CBD) and the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). In addition, the international conservation community, through the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), has also explored new ways to integrate the potential roles and rights of local communities and indigenous peoples into conservation initiatives. Three approaches are developing in the conservation of biodiversity in society: the New Conservation Science Approach, Half-Earth Approach, and Biocultural Approaches (Gavin MC et al., 2018) (Figure 4).














	New Conservation Science Approach	Half Earth Approach	Biocultural Approaches
What?	 Biodiversity conservation, especially ecosystem services	 Biodiversity conservation, especially species and ecosystem integrity	 Multiple objectives of relevant stakeholders
Why?	 Emphasis on instrumental value of biodiversity	 Emphasis on intrinsic value of biodiversity	 Pluralistic worldviews (including relational (7), intrinsic, instrumental values)
Where?	 More emphasis on human-dominated landscapes	 More emphasis on remote locations and wilderness	 Tailor interventions to social-ecological context
How?	 Emphasis on economic incentives and payment for ecosystem services	 Emphasis on strict protected areas	 Diverse and nested institutions with adaptive governance and management
Who?	Not specified	Not specified	 Partnerships and social learning among multiple stakeholders

Figure 4. Fundamental question for different visions for conservation

Meanwhile, various opportunities related to biodiversity conservation can be carried out and adapted to regional conditions and the people in the region. Options that can be implemented include:

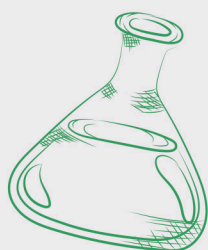
- Strengthening protected areas.
- Campaigns to save endangered species.
- Support for scientific research and analysis.
- Support for environmental education and awareness building.
- Sharing information on biodiversity.
- Support for integrated conservation and development.

SEAMEO BIOTROP then translated these opportunities into various activities to increase the biodiversity education science program to increase the public and young generation's awareness of the importance of preserving biodiversity. One of them is through the promotion and initiation of program collaboration in various international activities, as has been done by the Deputy Director for Administration, SEAMEO BIOTROP, in a series of events towards the GEF-8 National Dialogue Indonesia (NDI) organized by the Indonesian Ministry of Environment and Forestry (KLHK) in collaboration with the Secretariat of the Global Environment Facility (GEF), based in Washington, United States of America. Among them is SEAMEO BIOTROP's involvement in the Focus Group Discussion for Youth & Business on Climate Change. It brings together young and inspirational individuals working on potential projects to address climate change issues.

In addition, on this occasion, SEAMEO BIOTROP was also actively involved in the discussions that were held and said that in line with NDI's goals, as stated in the 11th FYDP, SEAMEO BIOTROP also wanted to have an expert roster in the field of tropical biodiversity through the BAA Program. The BIOTROP Affiliate and Association Program (BAA) is a network of researchers, experts, and practitioners in tropical biology and the sustainable management of tropical ecosystems. BAA members will have priority in research, training, and information dissemination activities organized by SEAMEO BIOTROP, publishing articles in SEAMEO BIOTROP print and online media, networking opportunities, and being introduced to many research opportunities nationally, regionally, and internationally.

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Scientist



Envisioning Regional Partnership on Education Towards ASEAN Presidency

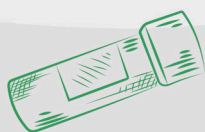


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The Idea of ASEAN Presidency and Focus on Regional Partnerships

As one of the founding countries of ASEAN and the largest country in ASEAN, many parties pin their hopes on Indonesia. With the hope that Indonesia can carry out various variations and innovations in dealing with various world problems that are also faced by the region. Through the theme of the ASEAN Presidency, namely: "ASEAN Matters: Epicentrum of Growth," Indonesia directs ASEAN cooperation in 2023 to continue and strengthen ASEAN's relevance in facing regional and global challenges, as well as strengthening ASEAN's position as the center of regional economic growth, for the prosperity of the ASEAN people.

Indonesia's Presidency also allows ASEAN to play an active role, offering ideas and solutions for peace and prosperity in the region. For this reason, as chairman, Indonesia can encourage and strengthen economic recovery and make Southeast Asia an engine of sustainable world growth. Indonesia's role in cooperation in the field of education including, but not limited to:

1. **Student exchange**

Indonesia plays a role in the field of education by establishing cooperation to carry out student exchanges. Students from other ASEAN countries can study in Indonesia, and vice versa students in Indonesia can study in ASEAN countries. Students can gain knowledge at the chosen educational institution, and study according to their interests and talents.

2. **Scholarships**

Apart from student exchanges, Indonesia also has a role in providing scholarships to students from other ASEAN countries. Indonesian students can also get scholarships from ASEAN countries, so they can seek knowledge in other countries. This scholarship is used for all educational programs according to students' interests and talents, such as languages, arts, sciences, and others.

3. **Develop Vocational Education**

Through education, Indonesia is working with other ASEAN countries to develop vocational education. Through vocational education, it is expected to produce a quality and skilled workforce. This collaboration is supported by a meeting of ASEAN education ministers so that it can be used to discuss efforts to promote education.

4. **Improving the Quality of Higher Education**

In addition, cooperation in other fields of education is to improve the quality of higher education.



Implementation of Merdeka Belajar Kampus Merdeka (MBKM)

As a translation of the idea of the ASEAN Presidency in education, the Ministry of the Republic of Indonesia is currently implementing the Merdeka Belajar Kampus Merdeka (MBKM) program. The MBKM Program is in line with the Ministerial Decree of the Minister of Education and Culture of the Republic of Indonesia Number 3 of 2020 concerning National Standards for Higher Education. In Article 18 it is stated that the fulfillment of the learning period and burden for undergraduate or applied undergraduate students can be carried out: 1) following the entire learning process in study programs at universities height according to time and learning load; and 2) following the learning process in the study program to fulfill part of the time and learning load and the rest following the learning process outside the study program.

Student competencies must prepare students to face a social and cultural world of work changes and rapid technological advances. Finding the link and match not only with the world of industry and work but also the rapidly changing future. Higher education must design and implement innovative learning

started at the beginning of the year and accept a total of 60 students from many universities in Indonesia. The theme “Management of Tropical Biodiversity” is manifested into four (4) internship activities, namely:

One of the leading programs is the right to study three semesters outside the study program. Students are given the freedom to take credits outside the study program in three semesters. One semester to take courses outside the study program and two semesters to carry out learning activities outside the tertiary institution.

Various forms of learning activities outside the college, including doing internships/work practices in the industry or other workplaces, carrying out community service projects in villages, teaching in education units, participating in student exchanges, conducting research, conducting entrepreneurial activities, making studies/ independent projects, and participate in humanitarian programs. All these activities must be carried out with the guidance of the lecturer. The Kampus Merdeka is expected to be able to provide contextual field experiences that will improve student competency, be ready for work, or create new jobs.

Since 2022, SEAMEO BIOTROP has become a partner of the Kampus Merdeka by participating in holding one of the activities in the MBKM program called Magang Bersertifikat Batch 3 (MSIB). In 2023, MSIB batch 4 started at the beginning of the year and accept a total of 60 students from many universities in Indonesia. The theme “Management of Tropical Biodiversity” is manifested into four internship activities, namely:

1. Environmental Quality Laboratory Management,
2. Management and Utilization of Sub-optimal Land in the Tropical Regions,
3. Tropical Biodiversity Risk Management, and
4. Sustainable Urban Agriculture.



The internship program focuses on ecosystem management and the use of technology to support the maintenance of the environment and the organisms around it so that it can be a solution for increasing and preserving biodiversity. The internship program is done through several methods: face-to-face, practicum, and fieldwork practices, which will provide knowledge and experience directly to students with a focus on biodiversity management. In its implementation, the internship is supported by various facilities and assets managed by SEAMEO BIOTROP. Currently, at least 10 study/study facilities, three testing laboratories, ±11 hectares of experimental fields, greenhouses, and other study/study supporting equipment are ready to support the student internships program.

Furthermore, in practice, SEAMEO BIOTROP's MSIB is designed and managed to support the outputs of SEAMEO BIOTROP's flagship program, which has been listed in the 11th Five-Year Development Plan (FYDP) of SEAMEO BIOTROP. The syllabus, technical, and output of the MSIB program are adjusted to support the SEAMEO BIOTROP flagship program. There will be a total of 45 Standard Operational Procedures (SOP), seven modules, three project-based learning, and 12 products should be produced during the implementation of MSIB Batch 4 and Batch 5.



Spring Course – START PROGRAM

SEAMEO BIOTROP in collaboration with Hiroshima University conducted the spring course – START Program from 11 to 20 March 2023 in Bogor. This is another contribution from SEAMEO BIOTROP to strengthen collaboration within Asia countries, especially with Japan. This course aims to promote the conservation of tropical biodiversity in Southeast Asia. In this trans-disciplinary lecture, participants will learn about tropical biodiversity; integrated approaches and methods in conservation; Sustainable Development Goals, policies, socio-cultural and agendas that influence the sustainability of tropical biodiversity. Through the course are expected to understand the concepts and implementation of saving biodiversity in Southeast Asia, build awareness and understanding of different kinds of biodiversity databases, and understand the concept of knowledge management in the biodiversity field. There were in total 12 students from Hiroshima University, the University of Indonesia, Padjajaran University, Lambung Mangkurat University, Universitas Negeri Malang and Brawijaya University took part in this course.

The activities were designed not only in class but also outclass experience. By visiting and learning about many aspects such as culture, agriculture, socio-economic, and agro-eco-edu-tourism implemented in Indonesia. During the course, the students also have to interact with each other so they have known each cultural uniqueness between two countries (Japan and Indonesia). For the final output of this program, there are four working papers produced by the students which focused on raising issues related to the conservation of tropical biodiversity in Southeast Asia and discussing the solution to the problem.

The SEAMEO Centres Policy Research Network (CPRN)

Environmental education in Indonesia is aimed at creating a community that shows concern for the environment and its related problems and that possesses the knowledge, motivation, commitment, and skills to work, both individually and collectively in finding alternatives or providing solutions to existing environmental problems and preventing the emergence of a new problem. Environmental science and biodiversity learning contained in living science is taught at the upper secondary level (both High school and vocational school), which is more precisely given in the first year of entry (Grade 10) under Ministry of Education and Culture Republic of Indonesia.

In supporting environmental education for school residents (principals and vice-principals, teachers and administrative staff, and also students), it is necessary to foster and develop a caring character among the community towards environmental conservation. One of these is through the inclusion of an environmental subject in the Natural science curriculum materials in 10th-grade junior high and vocational schools under Ministry of Education and Culture Republic of Indonesia.

Environmental and biodiversity materials in Indonesia are given separately in Biology lessons. In the Merdeka Curriculum, Environmental material is given to equip students to understand the interactions between living things and their environment so that later they can raise awareness and responsibility between humans, living things, and their environment. Meanwhile, biodiversity material is provided to equip students to identify levels of biodiversity, describe Indonesia's biodiversity and its role, and analyse the interactions of living things in their ecosystems. It is necessary to improve through several aspects, such education, health, way of thinking and work ethic, to realize changes in various fields of life, especially awareness of environmental conditions (Mak, O. T. 2014). Environmental Education is an educational subject that can be disseminated to all types of education, the formulation of appropriate policies, effective curriculum designs and proper orientation of teachers in teaching Environmental Education are the roots towards sustainable development policies (Yadav et al., 2022) (Figure 1).

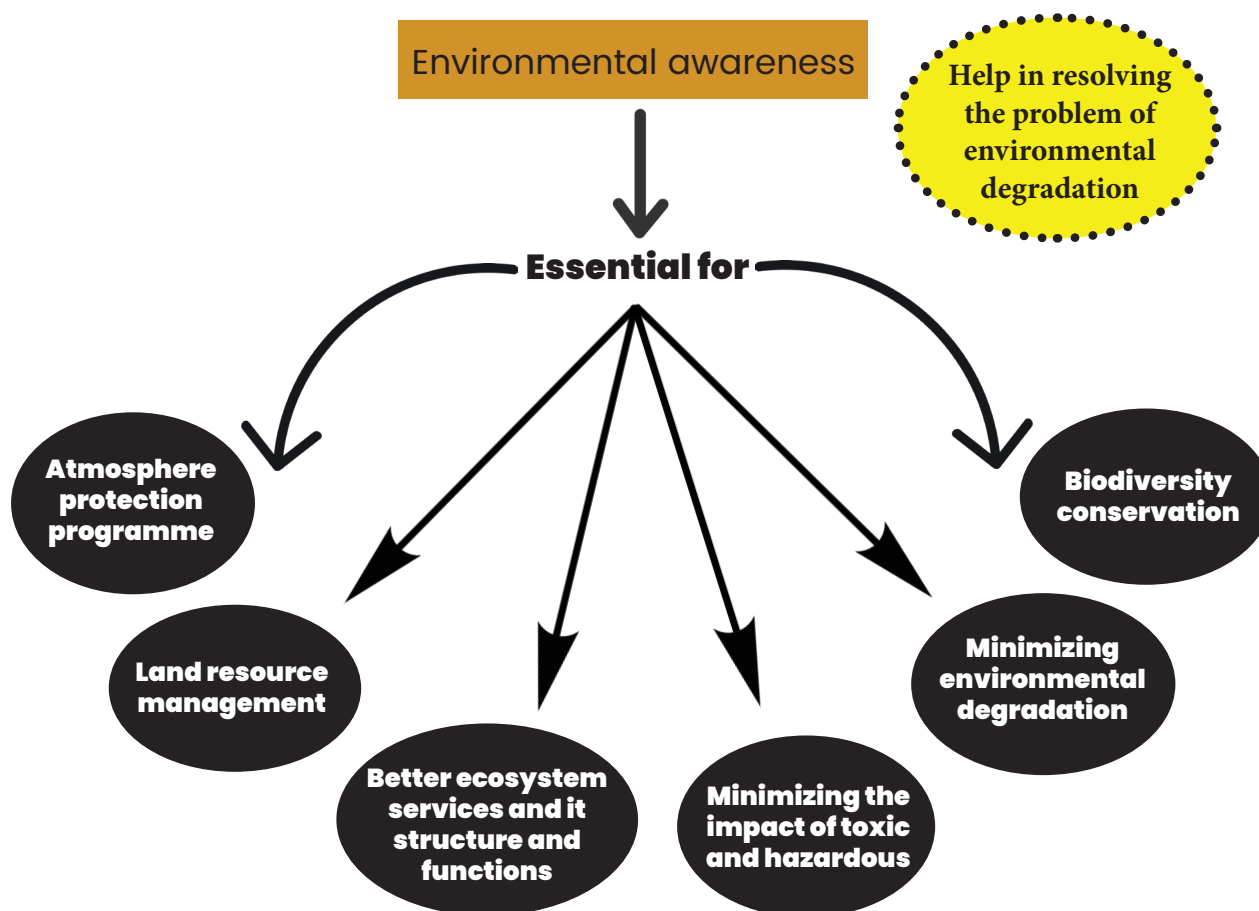


Figure. Environment awareness and its essential for sustaining life (Yadav et al. 2022).

As a leading center in Tropical Biology in Southeast Asia, SEAMEO BIOTROP needs to develop an improve innovative strategies to address strategic problems and challenges in Science and Education, one of which is related to efforts to save biodiversity from an early age. One of the activities to save biodiversity can be started through environmental education. Environmental education aims at forming a community that shows concern for the environment and related problems, as well as those who have the knowledge, motivation, commitment, and ability to works, both individually and collectively, in finding alternatives or providing solutions to existing environmental problems and preventing the new issues from arising.

Therefore a research in formulating the needs of biodiversity inclusion to the high schools in Bogor, Indonesia was conducted to increase the quality education. A set of question was made available to have better data and analysis representing their awareness, interest, knowledge on environmental issues, and conservation. The external meeting participants were also welcomed to give questions, comments, suggestion on methodology, parameters on data collection and analysis, as well as the usefulness of the research results for the inclusion of biodiversity conservation efforts in curriculum of ASEAN high schools.

Based on Recommended BIOTROP CPRN Research Report 2023 (Table 1), it stated that the separate provision of biodiversity and environment materials is considered ineffective because only 54 students had knowledge, 40 students had an attitude, and 37 students had practised saving biodiversity linked to environmental issues (Zulhamsyah et al., 2023).

Table 1. Result of KAP (Knowledge–Attitude–Practice) Dimension of Biodiversity Inclusion Analysis

Status	Parameter	Group	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Knowledge	Low	27	27	27	27
		Middle	19	19	19	46
		High	54	54	54	100
		Total	100	100	100	
Valid	Attitude	Low	40	40	40	40
		Middle	24	24	24	64
		High	36	36	36	100
		Total	100	100	100	
Valid	Practice	Low	37	37	37	37
		Middle	27	27	27	64
		High	36	36	36	100
		Total	100	100	100	



Quantitative data collection was carried out using a questionnaire. The preparation of the draft questionnaire was carried out simultaneously with the implementation of "Regional Workshop on The Inclusion of Biodiversity in the Environmental Education Curriculum" which was held at SEAMEO BIOTROP, Bogor, Indonesia on 01-03 August in 2022. This workshop was attended by more than 126 participants from Indonesia, Cambodia, Malaysia, and Philippines. The participants consisted of 8% came from Governance, 9% from Research agencies, 43% from Schools, 35% University and 5% from private companies. Furthermore, content and format development was carried out on the draft questionnaire that had been obtained. During trials, the questionnaire setup should be similar to that used in the study, and respondents should be given space to write comments about the questionnaire. We want to know if it's taking too long to complete if the clues and items are clear, and so on. If there are enough test subjects, reliability estimates can be calculated, and some indication of whether there is variability in answers to investigate various relationships. The basis of the questionnaire review used the Pearson validity test and the Cronbach Alpha reliability test.

Saving biodiversity in early education by including biodiversity in environmental education in the curriculum of High school or vocational students at the ASEAN level is critical. The current biodiversity crisis requires increased understanding and awareness of ecological concepts [6]. There were no answers to questions on general information that reach more than or equal to 50%. The fact that the student's awareness on biodiversity knowledge and conservation is still low to moderate, It is the time for new generation (high school), as future leaders, to have better understanding on the role of biodiversity conservation for their future.

Recommendations

Several things can be recommended from the research results, as below:

1. It is necessary to increase the competencies of teachers in the inclusion of biodiversity conservation in their curriculum by conducting training of trainers at SEAMEO BIOTROP.
2. Develop more interactive social media for biodiversity conservation and natural disaster campaigns as learning media and learning materials with regard to learning outcomes (LO) for each subject in high school and vocational school.
3. Educate the teachers and students on biodiversity conservation and bio-prospection through agro-eco-edu-tourism.
4. Networks among the ASEAN Countries in biodiversity inclusion in high school will strengthen and accelerate the achievement of Sustainable Development Goals, especially Goal Number 4, and therefore it is necessary to conduct official collaboration among the partners.

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BIOTROP In Transition

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BIOTROP In Transition

For over 55 years since its establishment on 6 February 1968, the Southeast Asian Regional Centre for Tropical Biology (SEAMEO BIOTROP) has been supporting The Southeast Asian Ministers of Education Organization (SEAMEO) in promoting regional cooperation in education, science, and culture. Located in Bogor, West Java, Indonesia, SEAMEO BIOTROP implements its programs and activities to promote regional education cooperation and human resource capacity development through research, trainings, and information dissemination.

As one of regional Centres of SEAMEO in Indonesia, BIOTROP is hosted by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia (MoECRT). The Centre's headquarter is located on +11 hectares' land of IPB University as the Home Base and facilitated with office buildings, conference hall, dormitories, laboratories, greenhouses, research field, and supporting infrastructures. To support its programs implementation, the Centre is also equipped with laboratory and office equipment. All buildings and equipment belong to MoECRT.



Issuance of the New Ministerial Decree

On 23 December 2022, The Minister of Education, Culture, Research, and Technology of the Republic of Indonesia issued a Ministerial Decree (KEPMEN) No. 511/O/2022 on the Host Institution and Home Base of the SEAMEO Centres in Indonesia. In accordance to the Decree, the Host Institution of SEAMEO BIOTROP was changed from the General Secretary of MoECRT to the Secretariat Directorate General of Higher Education of MoECRT. The Decree also assigned the IPB University as the Centre's Home Base.

The new Ministerial Decree, highlighted the following:

- | | |
|-----------------------|---|
| FIRST DICTUM | : Assigned the Secretariat Directorate General of Higher Education of MoECRT as the Host Institution and IPB University as the Centre's Home Base. |
| SECOND DICTUM | : The Centre implements its tasks and function in accordance with the Centre's Enabling Instrument |
| THIRD DICTUM | : The Centre is led by a Director who is selected by the General Secretary of the MoECRT and appointed by the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia. |
| FOURTH DICTUM | : The Centre Director is assisted by the Deputy Director for Administration and Deputy Director for Program who are selected 6 months' prior the end of term at the latest and appointed by the General Secretary of MoECRT upon the recommendation of the Centre Director. |
| FIFTH DICTUM | : The SEAMEO Centres in Indonesia shall organized a coordination meeting every six months and invites related bureau of the MoERCT to human resources and cooperation. The Centres shall also report the tasks and function implementation to the Host Institution. |
| SIXTH DICTUM | : The source of fund to support the Centre's programs implementation comes from the Government of Indonesia (Gol). |
| SEVENTH DICTUM | : The Centre may engage other source of fund than Gol to support the implementation of its tasks and function in accordance to the Centre's Enabling Instrument. |

In response to the new Ministerial Decree, SEAMEO BIOTROP took certain follow-up actions to ensure the implementation of priority and operational activities in transition period. The priorities include implementation of an internship program of the Higher Education of the Ministry of Education, Culture, Research, and Technology (MoECRT) of the Republic of Indonesia, improving human resource management and optimizing financial, facilities, and assets management. The actions taken are as follows:

1. The issuance of Director's decree on the end of the term of BIOTROP staff No. 2694/KP/XII/2022 dated 30 December 2022.
2. The issuance of Director's decree No. 2903/KP/01.02/XII/2022 on 29 December 2022 on the establishment of the Transition Team consists of 9 members to support the Board of Director in taking immediate actions during transition period from January to March 2023.
3. The issuance of Director's decree No. 015/KP.01.01/I/2023 on 4 January 2023 on the Transition Supporting Team consists of 31 individuals to support the Transition Team in implementing priority and operational activities during transition period from January to March 2023.
4. The issuance of Director's decree No. 212/KP.01.01/II/2023 dated 13 February 2023 on the establishment of the Independent Transitional Team to assist the Board of Director in finalizing the Centre's Structure and Staff Formation for the year 2023.
5. The issuance of Director's decree No. 223/KP.01.01/II/2023 dated 15 February 2023 on the amendment of Transition Team from 9 members into 6 members based of the performance evaluation of the previous Transition Team.

Human Resources

Until 31 December 2022, the Centre staff comprised of 29 Civil Servants of IPB University, 1 Civil Servant of MoECRT, and 34 Non-Civil Servants. On 31 December 2023, the contract of all Centre's Staff has ended. However, 49 personnel expressed their willingness to continue working for the Centre in 2023 by signing a letter of statement on 30 December 2022. Based on the letter, the Centre Director signed two decrees to assign nine personnel as members of the Transition Team and 31 personnel as the Supporting Transition Team. The remaining personnel were arranged as scheduled staff and on-request staff.

Due to the organizational transition, the Centre has to synchronize its program design and activities to adapt to the new host institution's output indicators. As a consequence, the Centre shall adjust the human resources arrangement based on program requirements. After a series of discussions among the Board of Directors, Executive Committee, Transition Team, and Independent Transition Team on personnel competencies, expertise, interests, and outputs, followed by several interviews with related personnel, and considering the program design, on 15 March 2023, the Centre formulated the new organizational structure and staff mapping for the year 2023. A total of 15 Civil Servants and 33 Non-Civil Servants were selected to be proposed as the Centre's staff. At the same time, the remaining 11 Civil Servants of IPB University are to be assigned in a related unit within IPB University, referring to their competencies.

With less number of staff, the Centre still has to achieve its previous targeted outputs. It is a big challenge and, at the same time, the best moment to enhance staff capacity, start better organizational governance, and improve the Centre's performance. Therefore, every staff is assigned with specific targeted outputs as the indicator for staff performance evaluation. Reward and punishment mechanism will be implemented based on the result of staff performance evaluation.

The list of proposed staff was then submitted to the host institution for the issuance of the Letter of Appointment signed by the Secretary Directorate General of Higher Education of the MoECRT. The Letter of Appointment was issued on 10 April 2023. The Centre also submitted a proposal to IPB University and the General Bureau of the MoECRT for the purpose of Letter of Assignment issuance of the 15 Civil Servants staff to be assigned at the Centre.



Pict 1. Civil Servant Staff with IPB University, Vice Rector for Resource and Infrastructure Resilience and the Director of Human Resource Directorate.

Financial and Facilities Management Optimization

In line with the new program design and human resource mapping, the Centre shall integrate it into the budget allocation from GoI source of fund for fiscal year 2023. To optimize financial management, the Centre introduced a centralized bank account controlling mechanism, modifying cash advance and liquidation flows, establishing financial authorization and scheduled withdrawal mechanism. With less number of finance staff, the Centre shall provide appropriate financial services by re-arranging tasks of the remain finance staff. In addition, the Centre shall also analyze the activities proposed budget to ensure the implementation of cost-efficient orientation and maximize the utilization of the available funds.

Under coordination of the host institution, the Centre implement the "CAHSLESS" mechanism. By this mechanism, the payment shall be made directly from the host institution's financial bureau to related staff or suppliers. Since January 2023 the Centre joined as series of coordination meetings between 3 SEAMEO Centre in Indonesia, Beurau of Planning, and beurau of Finance of the host institution on the funding mechanism. The Centre has also attended a coordination meeting with related bureau of the host institution to synchronize the management of procurement, Financial Report, and Asset Database.

During the transition period, the official staff formation has not established yet. However, the Centre continues to secure the assets and facilities. A total of 18 security officers and 21 cleaning service officers out of 33, have been occupied since January 2023. With less number of cleaning service officer, the office and surroundings shall be clean. Thus the Centre made a rotation of the cleaning service officers and added the security officer's task by cleaning the certain areas of the office.

To optimize facilities and assets management utilization, the Centre organized the utilization of facilities and assets, prioritize facilities maintenance, and establish daily monitoring activities.

As stated in the SEVENTH DICTUM of the Ministerial Decree No. 511/O/2022, the Centre may engage other source of fund than GoI to support the implementation of its tasks and function in accordance to the Centre's Enabling Instrument. This is assumed that the other source of fund may come from cooperation activities on the facilities and assets optimization. The cooperation on facilities and assets optimization shall involve the MoECRT and IPB University. Strategy to establish such cooperation aims to enhance the quality of facilities and assets in supporting the Centre's programs.

Conclusion

SEAMEO BIOTROP has a long history of providing valuable services and expertise in the field of tropical biology and conservation. Established in 1968, the institution has been contributing to address tropical biology issues through research, training, and information dissemination in Southeast Asia. Its mission is to promote sustainable regional development by applying science and technology in tropical biology and biodiversity conservation.

SEAMEO BIOTROP's transition efforts demonstrate its dedication to ensuring a smooth and effective transition to the new system. The establishment of transition teams and the prioritization of key activities, such as human resource management improvement, financial management development, and facilities and assets management utilization, are all critical steps in this process.

By improving its management and operations, SEAMEO BIOTROP will be better equipped to fulfill its mission and continue to provide valuable services and expertise in tropical biology and conservation. This is especially important as the region faces ongoing environmental challenges, such as deforestation, habitat loss, and biodiversity decline.

In conclusion, the issuance of the new Ministerial Decree from MoECRT Indonesia represents a significant change for SEAMEO BIOTROP. Still, the institution remains committed to promoting sustainable development in the region. The establishment of transition teams and the prioritization of key activities demonstrate its dedication to ensuring a smooth and effective transition to the new system. By improving its management and operations, SEAMEO BIOTROP will be better equipped to continue providing valuable services and expertise in tropical biology and biodiversity conservation and contribute to the region's sustainable development while supporting the key performance indicators of its host and home-based institutions.



What's on **SEAMEO BIOTROP**

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SEAMEO BIOTROP Director and SSA Awardee from SEAMEO BIOTROP Join the 52nd SEAMEO Council Conference

Education leaders from Southeast Asian countries gathered in Mandaluyong City, Philippines, on February 8-9, 2023, for the 52nd SEAMEO Council Conference (SEAMEC). The conference was attended by notable figures in the education sector, including outgoing SEAMEO Council President H.E. Mr. Chan Chun Sing from Singapore and Philippines Vice President and Secretary of Education Sara Z. Duterte.

The conference, which carried the theme “Transformation through Learning Exchange: Building Resilient Systems as a Region,” aimed to address the pressing issues of equitable access to education and post-pandemic recovery and the need for resilience in education systems in many countries. The three-day event also provided a platform for education champions to discuss and share their best practices for strengthening their education systems.

In her opening message, Vice President and Secretary of Education Sara Z. Duterte stressed the urgency of addressing learning gaps and education equality. “We need to act now. We cannot afford to waste more time. As education leaders, we cannot allow a single child to miss out on the opportunity and benefits of learning and the wonders of being able to use it positively,” she said.

The Education Chief also called for all ASEAN leaders to embrace “Bayanihan”, which translates to “Spirit of civic unity and cooperation”, and to take their responsibility as education leaders seriously, as their decisions today will impact the quality of life in their countries and the entire ASEAN Region for generations to come.

Duterte also presented the MATATAG Agenda of the Department, highlighting the agency’s commitment to improving the quality of basic education in the Philippines. Meanwhile, H.E. Mr. Chan Chun Sing discussed the innovative ways in which ASEAN countries coped with the pandemic and how it has shaped the landscape of their education.

The conference concluded with the election of VP Secretary Sara Duterte as the Council President from 2023 to 2025, further solidifying her commitment to addressing the challenges faced by the education sector and promoting education equality in the Southeast Asian region.

The Director of SEAMEO BIOTROP, Dr. Zulhamasyah Imran, and the recipient of the SEAMEO Service Award from SEAMEO BIOTROP, Trijanti A. Widinni Asnan, also attended the 52nd SEAMEO Council Conference.

Summarized from: <https://www.deped.gov.ph/2023/02/09/vp-sara-calls-for-bayanihan-urgency-in-addressing-learning-gaps-in-52nd-seamec>

(zi, twa, hcn)



SEAMEO BIOTROP Collaborates with Mindanao State University for Regional Development

SEAMEO BIOTROP Director Dr. Zulhamsyah Imran and representatives from the Mindanao State University met in Davao City on February 9, 2023, for a dinner and brief collaboration discussion. They were joined by Dr. Mark Jude Trondillo, the Director of Research, Development and Innovation at Davao del Sur State College.

In 2022, SEAMEO BIOTROP and MSU collaborated on a series of events to promote biodiversity conservation education, essential oils therapy against COVID-19, and tropical plant identification, among other topics. The events brought together participants from universities across the Philippines.

Through these collaborative efforts, SEAMEO BIOTROP and MSU hope to increase regional visibility and promote sustainable development in Southeast Asia.



The most beautiful duck in the world

The world is full of beautiful creatures, and one of the most stunning among them is the Mandarin duck. Known for its vibrant colors and striking patterns, this bird is a favorite among bird watchers and nature lovers alike.

Native to East Asia, the Mandarin duck is a medium-sized bird that is typically found in wooded areas near streams and ponds. The male is known for its brightly colored plumage, which features a combination of orange, green, blue, and purple. Its wings are adorned with white stripes and its head is topped with a distinctive crest of feathers. The female, on the other hand, is less showy, with a brownish-gray plumage that helps her blend in with her surroundings.

The Mandarin duck's colorful appearance is not just for show, however. These birds use their stunning plumage as a way to attract mates during breeding season. The males will perform elaborate courtship displays, showing off their feathers and vocalizing to impress the females.

But the Mandarin duck's beauty is not just skin deep. These birds are also known for their impressive swimming abilities. They have a unique paddle-like shape to their feet, which makes them excellent swimmers. In fact, they are so adept at swimming that they have even been known to dive underwater in search of food.

Unfortunately, the Mandarin duck is not without its challenges. Habitat loss and hunting have led to a decline in their populations, and they are now considered a vulnerable species. However, efforts are being made to protect and conserve these beautiful birds, including the establishment of protected areas and the implementation of hunting restrictions.

In conclusion, the Mandarin duck is truly one of the most beautiful creatures in the world. Its striking colors, impressive swimming abilities, and courtship displays make it a favorite among nature enthusiasts. While its conservation status is a concern, efforts to protect and conserve these birds give hope that they will continue to grace the world with their beauty for years to come. (as).



SEAMEO BIOTROP Started the Year with Dissemination of Featured Programs and Golden Tickets



To start the year 2023, SEAMEO BIOTROP is holding a dissemination activity for its flagship program and the Golden Ticket program. Through this program, it is hoped that more high school graduates will be able to continue their studies at a higher level and also create young entrepreneurs. The event was held on January 10, 2023 in the Jati Room of SEAMEO BIOTROP and online through the zoom platform.

Through the Golden Ticket program, prospective students can register for the Distance Education (PJJ) D3 Computer Engineering program at the State Polytechnic of Electronics in Surabaya (PENS) without taking an entrance exam. Prospective students can take courses while still in high school and the certification of completion from these courses will be converted into credit hours during their college studies.

In his statement, Drs. Edy Purwanto, Head of the Vocational High School Division of West Java Education Office, said "The Golden Ticket is a pattern for increasing human resources, with the goal of eliminating unemployment among high school graduates and turning them into college graduates and entrepreneurs."

"This is closely related to the number of vocational high school graduates in West Java which is relatively high, reaching 1.6 million students every year. Therefore, breakthroughs need to be made through Innovation, Collaboration, and Decentralization," he continued.

The Computer Engineering program as the goal of the Golden Ticket is also considered very strategic. IT technology has made it possible

to improve the efficiency of a process, both in terms of communication, as seen during the Covid-19 pandemic, but also in other fields such as fisheries, agriculture, and small and medium enterprises. Through the Golden Ticket program, prospective students are invited to think critically from the high school level. Students are expected to be able to solve problems related to various themes, such as tourism, digitalization of schools, and food security.

Dr. Gatot Hari Priowirjanto hopes that SEAMEO BIOTROP can become a hub for the Golden Ticket program, where vocational high schools and high schools can conduct internships and courses in Bogor. Collaboration between the development of Information Technology led by PENS for packaging food security content, both agriculture and fisheries from SEAMEO BIOTROP.

Dr. Zulhamasyah Imran, Director of SEAMEO BIOTROP, emphasized in his presentation the importance of contributing to the education of future generations to become more motivated through various flagship programs of SEAMEO BIOTROP such as Agro-Eco-Edu Tourism school and Biodiversity school.

Dr. Reesa Akbar, as the Head of Distance Education Program at PENS, also presented about the Golden Ticket scheme and the Distance Learning D3 Information Technology Program at PENS, which allows students to work while studying. With consideration of more flexible, cost-effective, safe, and independent studies.

Slamet Widodo Sugiarto, M.Sc. acted as the moderator of the event. (hcn).

SEAMEO BIOTROP Hosts Delegations from SNU and ICO IPB for Collaboration Discussion

10 February 2023, SEAMEO BIOTROP welcomed delegations from Seoul National University (SNU) and the International Collaboration Office of IPB University for a visitation. The delegation comprised several prominent professors and leaders from SNU's College of Agriculture and Life Sciences, Veterinary Medicine, Bio Science and Technology Institute, Graduate School of International Agricultural Technology, and the Asia Forest Institute.

The visit was marked by welcoming remarks by the Deputy Director for Administration of SEAMEO BIOTROP, Dr Perdinan, followed by introductions and remarks from the delegations. The primary purpose of the visit was to discuss potential collaboration between the two institutions, particularly in the areas of scholarship and collaborative research.

The delegations then took a tour of SEAMEO BIOTROP's facilities, including the Aquatic Laboratory, Stingless Bee Garden, and Sensory Garden.

This visit marked a significant step in the collaboration between SEAMEO BIOTROP, SNU and ICO IPB University. Both parties are excited about the potential for future partnerships and the exchange of knowledge and expertise.

The delegations from Seoul National University (SNU), including (1) Prof. Yun Cheolhul from the College of Agriculture and Life Sciences, (2) Prof. Seo Kangmoon from the College of Veterinary Medicine, (3) Prof Im Jeongbin as Director General, Institut of Bio Science and Technology, (4) Prof. Suh Kyi, and (5) Prof Kim Jukon as Dean from Graduate School of International Agricultural Technology. From Asia Forest Institute: Ms Kwon Huiyeon, Ms Puput and Ms Karima from the International Collaboration Office of IPB University. (hcn, sa).



SEAMEO BIOTROP, IPB University, and ICMI Plants 3500 Mangrove and 7 Rare Tree Species in Ketapang Urban Aquaculture

The Association of Alumni of IPB (HA IPB), SEAMEO BIOTROP, IPB University, Ikatan Cendekiawan Muslim Indonesia (ICMI), and other parties collaborated in the planting of mangroves and rare Indonesian trees on Tuesday, 27 December 2022. In this activity, 3,500 mangroves and seven types of rare Indonesian trees were planted in the Ketapang Urban Aquaculture (KUA) Tangerang area.

The implementation of the mangrove and rare tree planting activity is considered very strategic not only because of its close location to the capital city of Indonesia but also because it is carried out along with the emerging issue of carbon storage. Mangrove and rare Indonesian trees are considered as the essential carbon storage and, therefore, simultaneous planting of mangrove and rare trees will significantly contribute to lowering carbon emissions.

At least there are four strategic objectives of the mangrove and rare tree planting program, i.e. environmental education, emission absorption, multi-party collaboration, and rare tree conservation. These four goals will be achieved in one activity and it is hoped that in the future there will be more multi-party collaborations that can support the mangroves and rare Indonesian trees.

According to Dr Zulhamsyah Imran, Director of SEAMEO BIOTROP, the mangrove conservation program in KUA was started in 2018. Now, four years later, the area has become a source of pride, not only for Tangerang District but also nationally. He also hopes that the National Movement for Planting Mangroves and Rare Indonesian Trees will be able to grow even more.

The community is already familiar with the mutually beneficial relationship between the presence of mangroves and fish and crabs. In a good mangrove habitat, there will be plenty of food for fish and crabs. In addition, the presence of good mangroves will prevent large waves from reaching the land. Therefore, mangroves are often called sustainable shields for the community from the threat of waves and tsunamis.

Unfortunately, mangroves in Indonesia are currently experiencing severe damage. The 3.5 million hectares of mangroves in Indonesia have suffered more than 50% damage. This damage is caused by some parties, threatening the safety of the community and certainly threatening the wildlife that lives in the mangrove habitat.

According to various research, the carbon reserves of mangroves are very high, especially for mangrove soil carbon. This is what makes many parties pay attention to the issue of blue carbon, which is a campaign to increase awareness of the importance of mangrove forests in reducing carbon emissions.

The planting of rare Indonesian trees and mangroves is a great contribution to the protection and conservation of Indonesian biodiversity. Some of the rare trees that will be planted are ebony (*Diospyros celebica*), a characteristic plant of Sulawesi, ulin (*Eusideroxylon zwageri*), a characteristic plant of Kalimantan, kepuh (*Sterculia foetida*), nyamplung (*Calophyllum inophyllum*), kemang (*Mangifera kemanga*), forest mango (*Garcinia* sp), and buni (*Antidesma bunius*). These rare trees are a gift from SEAMEO BIOTROP, the Association of Alumni of IPB, and IPB University to the Tangerang District Government.

In addition to the mangrove and rare Indonesian tree planting activity, SEAMEO BIOTROP also held a coloring contest for kindergarten and elementary school children.

Through this activity, children can learn the importance of preserving the environment and appreciating its biodiversity. This activity can also help to develop children's creativity and imagination, as well as increase their ability to express their ideas and thoughts through art. The coloring activity was attended by 65 students from 10 kindergartens and elementary schools in the Ketapang Urban Aquaculture area. (hcn).



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BIOSync podcast series discusses various biodiversity-related issues and topics through casual conversations so that they can be enjoyed by the general public. BIOSync podcast can be accessed through the SEAMEO BIOTROP Youtube channel.