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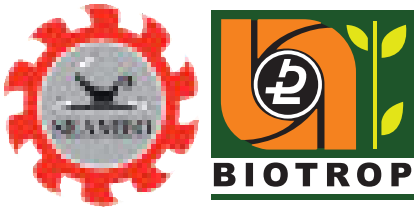
SEAMEO BIOTROP
ANNUAL REPORT
FY 2017 - 2018

SEAMEO BIOTROP

Annual Report FY 2017 - 2018

Southeast Asian Regional Centre for Tropical Biology
Jalan Raya Tajur Km. 6
Bogor 16134, Indonesia



Vision:

A Leading Centre in enriching and promoting the real values of tropical biology in Southeast Asia

Mission:

To provide scientific knowledge and capacity building in conserving and managing tropical biology sustainably for the well-being of communities and the environment of Southeast Asia

MESSAGE FROM GOVERNING BOARD CHAIR

On behalf of SEAMEO BIOTROP Governing Board, I would like to convey my sincere congratulations to SEAMEO BIOTROP for its achievements during the Fiscal Year (FY) 2017/2018.

The Governing Board members are pleased to witness the continuous developments in the Centre's programs and operations during the first-year of implementation of its 10th Five-Year Development Plan (FYDP). With the theme of *"Forging Ahead with Tropical Biology for Environmental and Societal Transformations in Southeast Asia* (Tropical BEST-SEA)", the Centre's research, training, knowledge transfer and community development activities have been contributing significantly in enriching and promoting the real values and sustainable use of tropical biological resources in Southeast Asia. We commend the Centre's efforts to expand and strengthen its collaborations and services to a wider range of stakeholders including communities and schools at all education levels within the Southeast Asian region. These developments certainly enhance the Centre's regional relevance and visibility.

We praise SEAMEO BIOTROP officials and staff for their commitment to carry out the activities they have planned for the fiscal year in review. We believe that the clients and partners appreciate the Centre's effective and efficient services very well.

We congratulate SEAMEO BIOTROP for its 50 years of services to the region in various aspects of tropical biology. We wish the Centre all the best for the next years to come. The Board will always be supportive of the Centre's programs and activities toward fulfilling its vision, mission, and goals.

We wish the best for the Centre's plan of activities for the next fiscal year and we look forward to another interesting accomplishment report again.

Mrs. Zaitunah binti Haji Kurus
Principal Wasan Vocational School
SEAMEO BIOTROP Governing Board

MESSAGE FROM THE DIRECTOR

I am pleased to present our Centre's accomplishments for Fiscal Year 2017/2018 in this annual report which marked the first-year of implementation of SEAMEO BIOTROP's 10th Five-Year Development Plan (FYDP 2017/2018–2021/2022) as well as the celebration of our 50 years of service through research, capacity building, and information exchange activities.

With the FYDP's theme of *"Forging Ahead with Tropical Biology for Environmental and Societal Transformations in Southeast Asia* (Tropical BEST-SEA)", SEAMEO BIOTROP continues to envision it self to be *"A leading Centre in enriching and promoting the real values of tropical biology in Southeast Asia".* We strive to achieve this by implementing activities under our three program thrusts, namely: Restoration of Degraded Ecosystem, Sustainable Management of Intensively Used Ecosystems/Landscapes, and Conservation and Sustainable Use of Unique Ecosystems/Landscapes of High Biodiversity. Our accomplishments are also categorized under SEAMEO three Key Result Areas, namely regional leadership, regional visibility, and solid resource base.

During the fiscal year in review, we celebrated our golden anniversary through a series of events involving our various stakeholders. We also completed our research projects, training courses and other learning events related to tropical biology, both implemented solely by the Centre and in partnership with other organizations and academic institutions. We expanded our collaboration by signing Memoranda of Understanding and Agreements with various organizations in order to conduct joint-research programs and learning events, to develop and enhance professional skills and to provide technical assistances within common areas of interest. We also received students and communities from various institutions and regions for the internships, on-the-job trainings and visit activities to learn about our agri-based technologies.

For all our achievements in FY 2017/2018, we would like to express our sincere appreciation and gratitude to our Governing Board members and their respective governments for the guidance and continued support in implementing our programs and activities. We are grateful to the Government of Indonesia and SEAMEO for the financial support. We extend our sincere gratitude to our partners and clients for their continuous trust in patronizing our products and services.

Dr. Irdika Mansur, M.For.Sc.
Director of SEAMEO BIOTROP

TABLE OF CONTENT

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EXECUTIVE SUMMARY

The Fiscal Year 2017/2018 marked the implementation of SEAMEO BIOTROP's 10th Five-Year Development Plan (FYDP 2017/2018-2021/2022) as well as the celebration of its 50 years of service in identifying and recommending solutions to address critical biological problems in Southeast Asia through research, capacity building, and information exchange.

With the FYDP's theme of "Forging Ahead with Tropical Biology for Environmental and Societal Transformations in Southeast Asia (Tropical BEST-SEA)", SEAMEO BIOTROP continues to envision itself to be "A leading Centre in enriching and promoting the real values of tropical biology in Southeast Asia".

The Centre's achievements under the fiscal year in review highlights its regular mandated activities as well as other special activities to commemorate its golden anniversary celebration. The year provided the opportunity for the Centre to honor its past directors and launched its new programs under its 10th FYDP.

This Annual Report presents the specific activities undertaken by SEAMEO BIOTROP in 3 SEAMEO's key result areas namely regional leadership, regional visibility, and solid resource base.

REGIONAL LEADERSHIP

The Centre completed 23 research projects during the first half of the Fiscal Year 2017/2018 and started implementing 20 other more research projects during the second half through its researchers, partner-institutions, and special program grantees. The completed research projects dealt with the Centre's program thrusts under its 9th FYDP while those that started in 2018 already address the new program thrusts of the Centre under its 10th FYDP.

The Centre trained 1,336 individuals by conducting 43 training courses and other learning events related to tropical biology during the fiscal year in review. The training courses and other learning events were implemented either solely by the Centre or in partnership with other national, regional and international research and development organizations and academic institutions.

REGIONAL VISIBILITY

During FY 2017/2018, the Centre expanded its collaboration by signing Memoranda of Understanding and Agreements with 25 national and regional organizations. These partnerships covered conducting joint-research programs and learning events, developing and enhancing professional skills and providing technical assistances within common areas of interest.

SEAMEO BIOTROP also provided opportunities for internships and on-the-job trainings for students of secondary and vocational schools and universities. In FY 2017/2018, the Centre accommodated 232 students from 64 learning institutions. These internships and/or on-the-job trainings were on the following areas: silviculture, entomology, hydroponic, natural products, biotechnology, herbarium, waste management, tissue culture, food and feed analysis, mushroom cultivation techniques, geographic information system, information technology and office administration. Moreover, the Centre also facilitated 22 undergraduate students from 5 universities to conduct their research.

During the fiscal year in review, SEAMEO BIOTROP accommodated 58 visits consisting of 3,348 people from various schools, universities, government agencies, private companies as well as regional/international institutions. Through these visits, the Centre established working relationships with most of these organizations.

The Centre published four books and proceedings, three issues of BIOTROPIA in printed and online versions, four issues of BIOTROP Courier, as well as 20 leaflets, banners and posters. These publication products were distributed to around 1,500 institutions.

SOLID RESOURCE BASE

In FY 2017/2018, Product Development and Services Department (PDSD) produced a total of 334,491 seedlings of Teak (*Tectona grandis*) and 32,885 of Banana (*Musa* sp.), Tin, Eucalyptus, Jabon (*Anthocephalus cadamba*), and Satoimo (*Colocasia esculenta* var *antiquorum*) through tissue culture technique.

As part of MoU with the Indonesian Ministry of Marine and Fisheries, the Center produced and distributed as much as 35,000 seaweed calluses, 1,868 micropagules, and 14 tons seaweed seeds to 20 provinces in Indonesia. The Centre's seaweed tissue culture micropagules, through the intermediary of the Lombok Aquaculture Fisheries Center, have also been distributed to countries in the Pacific Islands, namely: Micronesia, Fiji and Kiribati.

PDSD also produced 44,014 baglogs of oyster mushroom (*Pleurotus ostreatus*) and wood ear mushroom (*Auricularia auricula*) which were distributed to private companies and individual clients. This year, the department has started conducting research to develop straw mushroom (*Volvariella volvacea*) cultivation method.

As of June 2018, SEAMEO BIOTROP received a total fund equivalent to 1,416,006 USD from the Government of Indonesia during FY 2017/2018 for the operational use. The Centre also received a Special Educational Development Fund amounting to US$ 70,980. Moreover, the Centre received donations in cash from various institutions and generated additional income from dormitory rentals and interests from bank savings.

50th ANNIVERSARY CELEBRATION HIGHLIGHTS

SEAMEO BIOTROP turned 50 years old on 6 February 2018. The celebration lined up a year-long series of activities to herald the Centre's accomplishments through the years, recognize its past and current directors who contributed significantly to the development of the Centre, thank its partner-institutions, and strengthen the bond among its staff members and other stakeholders.

Below are some of the highlights of completed and forthcoming activities related to the Centre's golden anniversary celebration:

"

a. Opening of the golden anniversary celebration on 27-28 February 2018 at the Centre's Convention Hall with the theme "Forging Ahead with Tropical Biology for Environmental and Societal Transformation in Southeast Asia. The celebration featured the following:

   1. The launching of the collaborative program with the Ministry of Education and Culture (MoEC) of Indonesia on Non-Seasonal Fruit Production for the Revitalization of Vocational Schools in Indonesia. Aside from making the vocational schools greener and beautiful, this program is expected to increase the nutritional status of students and enhance the schools' productivity and entrepreneurship. The program now has 30 partner-schools located in 10 provinces of Indonesia.

   2. The launching of SEAMEO BIOTROP's flagship programs under its 10th Five Year Development Plan (FYDP) which includes: (a) SEAMEO BIOTROP Scientist Exchange Program, (b) SEAMEO BIOTROP Community Outreach Volunteers Program, (c) SEAMEO BIOTROP Weekend Lifeskills Training and Public Consultancy Program, (d) SEAMEO BIOTROP Online Training Program, e) SEAMEO BIOTROP Books and Special Publications Program, f) SEAMEO BIOTROP Policy Brief Series Program, (g) SEAMEO BIOTROP Expert Systems Development Program, and (h) SEAMEO BIOTROP Infographics Series Program.

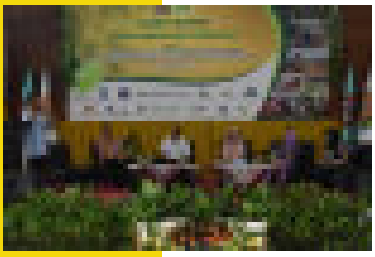
   3. Signing of Memoranda of Understanding (MoUs) with Universitas Gunadarma, Politeknik Pertanian Pangkajene Kepulauan, PT Garudafood Putra Putri Jaya, and Masyarakat Ahli Penginderaan Jauh Indonesia (MAPIN).

   4. Honoring of past directors of SEAMEO BIOTROP.

   5. Talk shows on (a) Empowering Schools and Communities for Food Security and Healthy Living, (b) Efforts to Restore Post-Mine Land to Productive Lands, (c) Promoting Research Cooperation Opportunities with Universities and Research Institutes, (d) Potentials of Essential Oil Plants and Product Development in Indonesia, and (e) Quality Seed Production to Improve Food Sovereignty.

   6. Exhibitions featuring educational goods and services from 30 schools, research agencies, and private companies.

   7. Open House to the Centre's various facilities, namely: Laboratory of Biotechnology, Remote Sensing, Aquatic, Hydroponics, Herbarium, Entomology, Tissue Culture, Water and Air, Phytopathology and Natural Product, as well as Mushroom Cultivation Unit and Wastewater Treatment Plant (WWTP) for incoming visitors.



b. Agri-based Production Webinars on Introduction to the Concept and Principles of Urban Agriculture, Aquaculture Production Techniques and Practices, Solid Organic Waste Management and Composting, Hydroponics/Aquaponics Production Techniques and Practices, Soil-based Vegetable and Fruit Tree Gardening, Oyster Mushroom Production, and Agri-based Business Development.

c. Badminton Tournament among the 7 SEAMEO Centres in Indonesia held on 25-26 June 2018.

d. Walk for the Environment among the Centres Board of Directors and staff members to be held on 16 August 2018.

e. 3rd International Conference on Biodiversity Conservation (ICTB) with the theme "Conservation, Enhancement, and Sustainable Use of Indigenous Flora and Fauna" to be held on 20-21 September 2018.

REGIONAL LEADERSHIP

Forging Ahead with Tropical Biology
for Environmental and Societal Transformations
in Southeast Asia (Tropical BEST-SEA)

RESEARCH AND DEVELOPMENT

To reinforce its goal providing science-based information in tropical biology, SEAMEO BIOTROP promotes the conduct of innovative research projects to develop novel solutions that address critical biological problems and enhance the real values and sustainable use of the region's tropical biological resources.

The Centre completed 23 research projects during the first half of the Fiscal Year 2017/2018 and started implementing 20 other more research projects during the second half through its researchers, partner-institutions, and special program grantees. The completed research projects dealt with the Centre's program thrusts under its 9th FYDP, namely: Tropical Biology for Community Welfare and Tropical Biology for Environmental Integrity. Research projects that were started in 2018 focus on the Centre's new program thrusts under its 10th FYDP, namely: Restoration of Degraded Ecosystems/ Landscapes, Sustainable Management of Intensively Used Ecosystems/Landscapes, and Conservation and Sustainable Use of Unique Ecosystems/Landscapes of High Biodiversity.

Appendix 1 lists the complete titles and proponents of all the research projects.

In-house and Joint Research Program

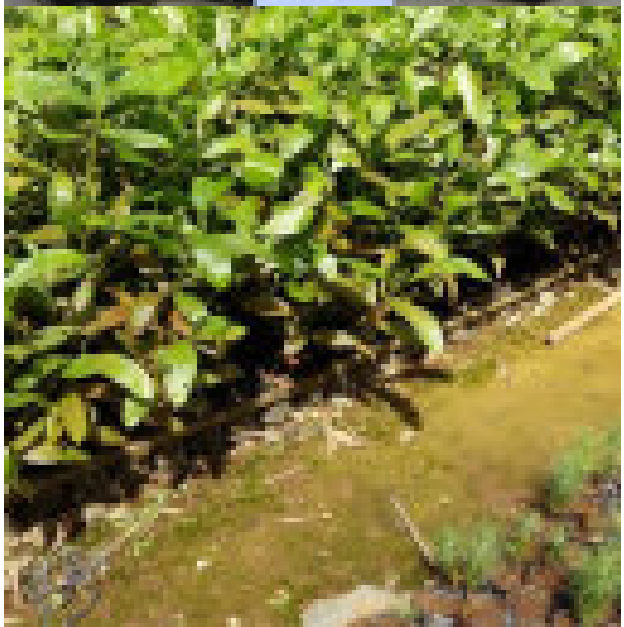
Fifteen of the completed research projects in 2017 and 11 of the ongoing research projects in 2018 were from the Centre's in-house scientists and researchers from partner-institutions.

Among the completed research projects that generated significant findings with regional implications are as follows:

- **Characterization of Soil Biophysicochemical Properties and Collection of Beneficial Soil Microorganisms Potential to restore Post-Gold Mining Area in Indonesia and the Philippines**

Mining activities are considered to have detrimental impacts on tropical biodiversity, particularly causing soil contamination.

The study of Dr. Happy Widiastuti and her team found beneficial microbes in post-gold mining areas in Indonesia and the Philippines that function as P solubilizer, N fixing, growth promoter, arbuscular mycorrhizal and Rhizobium. Inoculation of these microbes in combination with soil, compost and zeolite as medium for phytoremediation of the soil tailing enabled sengon (*Paraserianthes falcataria*) seedlings to grow well in the study sites.



- **Development of Fumigant Tablet and Gel Essential Oil-Based Formulation for Controlling Phosphine Resistant Strain of Stored-Product Insect Pests**

SEAMEO BIOTROP Entomology Laboratory team led by its affiliate scientist, Dr. Idham Sakti Harahap, has been conducting a series of studies since 2015 on developing essential oil formulations as alternative fumigants to control stored-product insects, particularly phosphine resistant strains of *T. castaneum*. Essential oils from artemisia, clove, lemon peel, peppermint, patchouli, cardamom, cinnamon, nutmeg, cullilawan, ginger and lemongrass were tested for this purpose.

In 2017, Dr. Idham's team tried developing fumigant tablet and gel containing the most effective essential oils against *T. castaneum* based on their previous research results. Their research revealed that the most effective fumigant tablets in causing mortality on *T. castaneum* were those that contained a mixture of hexane fraction of cardamom oil with naphthalene and a mixture of hexane fraction of mint with naphthalene (1:1) with 7 days exposure time. Fumigant gel showing the highest repellence level was hexane fraction of cardamom containing 2 ml of essential oil in 30 g gel with the level of repellence around 65%.

- **Promoting Styrax-Coffee Agroforestry System and Apiculture of *Trigona* sp. for White Propolis Production as Alternative Source of Livelihood for Communities in Lake Toba Catchment Area, North Sumatra**

To increase land productivity towards providing alternative sources of community livelihood as well as promote environmental sustainability around Lake Toba, Dr. Aswandi and colleagues introduced a strategy of integrating Trigona bee-producing propolis on agroforestry-styrax-coffee plantation set up. The study was specifically aimed to obtain (1) information on Trigona feed sources on agroforestry systems; (2) scheme of agroforestry-styrax-coffee and *Trigona cultivation* that optimize the land productivity and provide the highest economic income; and (3) information about productivity and phytochemical of Trigona propolis. The research activities were conducted at the incense forests in Pakpak Bharat, Humbang Hasundutan and the Aek Nauli Forest and Environment Development Research Institute.

The research results showed Trigona bee cultivation in agroforestry system generated high propolis and honey production. Propolis produced a typical incense aroma and contains phytochemical compounds such as polyphenols (flavonoids, phenolic acids), terpenoids and steroids. The abundant feed resources and uncomplicated cultivation techniques in an agroforestry system, high selling prices and demand for propolis products are some of the strengths and opportunities for Trigona bee cultivation development in Lake Toba as alternative sources of community-based livelihood and in increasing the crop productivity.

PhD Thesis Grants Program

Since 2011, SEAMEO BIOTROP PhD Thesis Grants Program has benefited 51 PhD students from several universities and research institutions in Indonesia. The awarding of thesis research grants aims to increase the number of qualified human resources in higher learning institutions and government agencies where the grantees are affiliated with the expectation that they would contribute to the development of Indonesia in the area of tropical biology and natural resources management.

For the period in review, the Centre helped two PhD students to complete their research thesis in 2017. These research theses dealt on the conservation of Rhinoceros Hornbill and Orangutan in Indonesia, respectively.

The six PhD thesis grants awarded in 2018 focused on the conservation of three species, namely: *Holothuria atra*, Garut sheep and Local Swamp Buffalo; and the sustainable management of small scale fisheries, mangrove ecosystem and honey production.

The grantees were from universities and research institutions who were pursuing their PhD degrees at the Institut Pertanian Bogor (IPB).

Youth Environmental Outreach Grants Program

SEAMEO BIOTROP's Youth Environmental Outreach (YEO) Grants Program aims to heighten the roles of youth by supporting the implementation of meritorious action research project proposals from deserving youth organizations.

In 2018, the Centre awarded a grant to IKAMaT Foundation, a youth organization from Semarang, to assess the water quality for aquaculture production in a pond created by abrasian at Satu Atap Junior Higher School and to determine the nutritional value of mangrove leaves and packaging them as snack food for students at Bedono Satu Primary School in Demak.

School Garden Action Research Grants Program for Teachers

Since its launching in 2016, the Centre provided grants to four schools as part of the Centre's roadmap for its School Garden Program until 2022. This action research projects are expected to generate best practices in improving students' literacy, nutrition and entrepreneurship through school gardening which will be compiled and published into a book in 2020. The school teachers, as project proponents, are expected to enhance their capacities in conducting action research or project-based learning activities with their students.

In 2017, the Centre provided grants to three schools teachers. The completed action research projects were: (1) Effects of Developing Urban Agriculture Thematic Gardens to Increase Academic Achievements of Students at the National Vocational School No. 5, Bandung, West Java, (2) Improving Self-reliance in Learning Through Hydroponic Gardening Using Task Analysis among Children with Mental Disabilities at Angkasa Special Education School, West Java, (3) Enhancing Students' Literacy and Nutrition Through School Garden at SMK Unggul Negeri 2 Banyuasin III, and (4) Indraloka School Garden: Toward Improving the Nutritional Status and Academic Performance of Students at the National Secondary School Taruna Nala, East Java.

For 2018, two out of six schools qualified for the grants. Their action research projects are (1) "Landscaping" as Project Based Learning in Creating an Artistic School Garden as Contextual and Integrated Learning Media in SMPN 13 Kota Sukabumi, and (2) Improving Cooperation and Nutrition Among Special Needs Students at School of Human Bekasi Through Vertical and Raised Bed Organic Gardening within the Teamwork Method of Learning.

TRAINING AND OTHER LEARNING EVENTS

For fifty years since its establishment, SEAMEO BIOTROP has created a reservoir of highly trained and well-placed human resources throughout the Southeast Asian region who were products of its capacity building activities.

For the fiscal year in review, 1,336 individuals benefited from the 43 training courses and other learning events related to tropical biology that SEAMEO BIOTROP conducted (*Appendix 2*). These courses were offered either solely by the Centre or in partnership with national, regional and international development and academic institutions involved in tropical biology. These capacity building activities consisted of regional, national, and in-country training courses, seminars and workshops; quarterly public seminars, and online training courses.

Some highlights of the regional and national learning events are as follows:

Regional, National, and In-country Training Courses, Seminars and Workshops

- **International Seminar on Current Developments in Mine Reclamation Practices and Mine Water Management**

One hundred participants attended the International Seminar on Current Developments in Mine Reclamation Practices and Mine Water Management held on 11 - 12 September 2017 in Palembang, Indonesia that BIOTROP jointly implemented with Universitas Sriwijaya. The seminar was aimed to communicate government policies and results of research activities conducted on mine reclamation and mine water management to the stakeholders of mining industry to improve existing practices. The research results were mostly generated from the project called Establishing a Network of Research Excellence for Mine Reclamation in Southeast Asia which was coordinated by Bangor University (UK) and BIOTROP (Indonesia). This project was a collaborative undertaking among BIOTROP, Bangor University and Aberystwyth University (UK), Western Carolina University (US), Institut Pertanian Bogor (IPB), Institut Teknologi Bandung (ITB), Universitas Diponegoro (UNDIP), Universitas Brawijaya (UB) and PT Bukit Asam. The project was funded by the British Council through the Global Innovation Initiative.

The speakers were: 1) Prof. Morag McDonald and Dr. Paula Roberts (Bangor University), Dr. Irdika Mansur (SEAMEO BIOTROP), Dr. Graham Bird (University of Wales, Aberystwyth), Dr. Bill Perkins (University of Wales, Aberystwyth), Prof. Anis Saggaff (UNSRI), Prof. Rudy Sayoga Gautama (ITB), Mr. Amarudin (PT Bukit Asam), Mr. Dedy Saptaria Rosa (PT Bukit Asam), Dr. Didik Suprayogo (UB) and Dr. Tri Retnaningsih Soeprobowati (UNDIP). Dr.Ir. Muhammad Firman, M.For.Sc. (Director of Soil and Water Conservation of Indonesia's Ministry of Environment and Forestry), Mr. Amarudin (PT Bukit Asam), Mr. Armaiki Yusmur (SEAMEO BIOTROP), Mr. Ali M. Muslih (IPB), Mr. Arief Juniarto (IPB), Mrs. Iva Dewi Lestariningsih (UB), Mr. Dedi Saptaria Rosa (PT Bukit Asam) and Dr. Hery Suhartoyo (Universitas Bengkulu) also presented their works in line with the themes.

The participants came from 43 institutions consisting of 12 universities, four vocational schools, 21 national mining companies, one forest community group and five government institutions in Indonesia, and the United Kingdom.

- **Tropical Plant Identification Workshop**

The Centre collaborated with the Ecological and Socioeconomic Functions of Tropical Lowland Rainforest Transformation System (EFForTS) Project to conduct a Tropical Plant Identification Workshop on 11 - 15 September 2017 at its headquarter in Bogor through the expertise of five taxonomists from the Kew Royal Botanical Gardens of the United Kingdom.

Twenty-one herbarium and botanical garden staff and environmental researchers mostly from the collaborating institutions of EFForTS Project who needed to enhance their knowledge and skills in morphological plant identification attended the workshop. The EFForTS Project is a collaboration between University of Goettingen and three Indonesian universities, namely: Institut Pertanian Bogor (IPB), Universitas Jambi, Universitas Tadulako and the Indonesian Institute of Science. Other partner-institutions that were invited to join the workshop were BIOTROP, Harapan Rainforest, Universitas Papua and the Indonesian Institute of Life Sciences.

The participants learned about the morphology and tools in identifying 38 tropical plant families from the collection of BIOTROP, IPB and Cibodas Botanical Garden herbaria. Through short illustrated lectures and extensive hands-on practical sessions, the Kew's botanists demonstrated to the participants the key characters for each family. Participants visited the Bogor Botanical Garden to apply in the field the knowledge they gained from the classroom sessions.

The workshop's resource persons were Dr. Timothy Utteridge, Dr. Andre Schuiteman, Ms. Alison Moore, Ms. Renata Borosova, and Ms. Lesley Walsingham from Kew and Dr. Katja Rembold from EFForTS Project. Dr. Rembold also served as workshop coordinator together with Dr. Sri Sudarmiyati of BIOTROP.

The workshop was funded by the German Research Foundation/Deutsche Forschungsgemeinschaft (DGF) through the EFForTS Project, with contributions from the German Academic Exchange Service (DAAD, in the framework of the collaboration "Biodiversity education and assessment in the South West Pacific") and BIOTROP.

- **In-country training on urban agriculture for 30 Malaysian special education teachers**

In collaboration with the SEAMEO Regional Centre for Special Education Needs (SEN) and the Malaysian Agricultural Research and Development Institute (MARDI), BIOTROP conducted an in-country training on urban agriculture for 30 Malaysian special education teachers on 8 - 11 August 2017 at MARDI Training Center in Serdang, Malaysia.

The training course was designed to enable special education teachers acquire basic knowledge and skills on specific technologies appropriate for urban agriculture with the expectation that such technologies could be adopted in their respective schools for their students to also learn and practice for personal, family, and community development purposes.

Representing the 14 states of Malaysia, the participants learned about various hydroponic and verticulture production techniques as well as composting, the roles of schools in developing agri-based life skills among their students in the context of Sustainable Development Goal No. 4, and approaches to establish urban agriculture technologies and teach them to their special education students in their respective schools.

Three Malaysian alumni from the BIOTROP's Urban Agriculture training in Bogor in 2016 served as resource persons. They particularly shared their experiences in implementing their action plans to establish their urban agriculture projects in their schools as well as the progress they have achieved so far in transferring the skills to their students. Other resource persons were Dr. Hanim bin Ahmad, Dr. Tosiah Sadi, Mr. Mohamed Hafeifi bin Basir, and Mr. Hamdan bin Mohd Noor from MARDI and Dr. Jesus C. Fernandez from BIOTROP.

The training was part of the MoU of BIOTROP with SEAMEO SEN and MARDI.

- **2nd National Training on School Garden for Student Literacy and Nutritional Improvement**

Thirty-eight teachers from seven provinces in Indonesia participated in BIOTROP's Second National Training on School Garden for Improving Student Literacy, and Nutrition, and Entrepreneurship held at the Centre's campus on 10 - 14 July 2017. The participants were from various kindergarten, elementary, junior high and senior high schools in Jambi, Lampung, Banten, DKI Jakarta, West Java, Central Java and DI Yogyakarta.

This training was specifically aimed to (1) enable participants to internalize the importance of nutrition to the education development of school children; (2) provide the participants with basic knowledge and skills on school garden models and agriculture technologies that could be adopted in a school garden setting; (3) introduce the concepts and principles of online teaching system to support literacy and nutritional development in the context of school garden; and (4) enable the participants to design their respective school gardens.

In conducting this training, SEAMEO BIOTROP collaborated with two other SEAMEO Centres, namely: Regional Centre for Food and Nutrition (RECFON) and the Regional Open Learning Centre (SEAMOLEC).

The participants received lectures and undergone hands-on exercises on: 1) School Garden Models for Literacy and Nutrition Improvement; 2). Nutrition status of students; 3) Household-scale composting of organic waste; 4) Hydroponic Production; 5) Basics of Vegetable Cultivation; and 6) Project-based Learning System.

The participants also learned about formulating action plans on establishing school garden in their respective schools as the major requirement of the training. The participants presented their action plans during the last day of the training for peer critiquing and further improvement.

Resource persons for this training were Dr. Awang Maharijaya from Institut Pertanian Bogor (IPB), Dr. Luh Ade Ari Wiradnyani from SEAMEO RECFON, Mr. Dona Octanary, S.Pd. from SEAMEO SEAMOLEC, Ms. Indrayani Supandi who is an alumnae from the 1st Batch of School Garden Training, and Prof. Arief Sabdo Yuwono, Dr. Jesus C. Fernandez, Ms. Riana Hartati, and Mr. Didi Junaedi from BIOTROP.

- 1st National Training on Marine Acoustic Technology Application

SEAMEO BIOTROP conducted the pilot offering of its National Training Course on Application of Acoustic Technology for Ocean Resources Mapping and Exploration held on 21 - 25 August 2017 at its headquarter and at the Ocean Acoustic Laboratory and Underwater Acoustic Signal Processing Laboratory of the Institut Pertanian Bogor (IPB) in Bogor.

Twenty-seven marine researchers and lecturers, and private individuals engaged in fishery production from various institutions across Indonesia constituted the first batch of participants of the training.

The main objective of the training course was to provide theoretical and practical knowledge and skills to the participants on the use and operation of marine acoustics instruments for the collection and analysis of fish, zooplankton, coral reef, sea grass and seabed data, and to some extent, for mapping and exploring archaeological resources.

The training course consisted of classroom and laboratory sessions covering: (1) Overview of Marine Acoustics Technology and Its Application; (2) Application of Marine Acoustics for Fish and Plankton Detection; (3) Application of Acoustics for Marine Archaeological Artifact Exploration; (4) Application of Acoustics for Marine BioSonar; (5) Application of Marine Acoustics for Coral Reef Mapping; and (6) Application of Marine Acoustics for Seabed and Habitat Mapping. The participants also experienced field hands-on exercises at Tidung Island in Jakarta.

This training was developed from the research project funded by BIOTROP and conducted by Prof. Dr. Henry Manik from the Ocean Acoustics and Marine Instrumentation Department of IPB from 2014 to 2016. Thus, Prof. Dr. Henry also served as both the coordinator and the resource person for this training.

- 6th National Training on Prevention and Control of Mycotoxins in Food and Feed Materials

Twenty-six participants completed BIOTROP's 6th National Training on Prevention and Control of Mycotoxin Contamination in Food and Feed Materials on 22 - 25 August 2017 held at the Centre's headquarter in Bogor.

This training was aimed to enhance the knowledge and skills of researchers, lecturers, and food processing staff in preventing and controlling mycotoxin contamination in food and feed materials, including corn, peanuts, nutmeg and wheat flour.

Through classroom lectures and lab exercises, the participants learned about (1) mycotoxin in food; (2) destructive fungi in food and feed and how to control them; (3) fungi isolation, counting and identification methods; (4) fungi identification using molecular biology technique; (5) Hazard Analysis and Critical Control Points (HACCP) and its implementation in food and feed industries; (6) method and quality assurance for testing of mycotoxins in food and feed materials; (7) mycotoxin testing using fluorometer and liquid chromatography methods; and (8) integrated warehouse pest control and proper phosphine fumigation. These lectures and lab exercises were provided by the following resource persons, namely: Prof. Okky S. Dharmaputra, Ms. Santi Ambarwati, M.Si., and Ms. Sri Widayanti, M.Si. from BIOTROP as well as Prof. Nuri Andarwulan from Institut Pertanian Bogor (IPB).

Through a small group exercise, the participants were able to simulate the application of knowledge and skills they gained from the training through analyzing and providing appropriate solutions to a specific food chain problem especially in relation to HACCP. They also turned in individual action plans on how to apply what they have learned from the training in their respective institutions.

Quarterly Public Seminars

The Centre organized three Quarterly Public Technical Seminars during the fiscal year in review at its headquarter in Bogor featuring three experts from various disciplines. This seminar series is aimed to provide a regular venue for local and international scientists and other enthusiasts to share their research and training knowledge and experiences in tropical biology and, in the process, develop networking with each other.

Brief descriptions of the seminars are as follows:

- **Yield Improvement of Oil Palm Plantation using Genetic Tools**

Dr. Chew Fook Tim, an associate professor and researcher at the Department of Biological Sciences from National University of Singapore elaborated on the topic above on 14 December 2017.

Dr. Chew explained that in order to improve the oil palm yield, the application of genomic information can be used in breeding program. The quantitative trait locus (QTL) analysis, genome-wide association study and genomic selection models, in combination with the application of network biology and functional genomic tools such as transcriptome, proteome and metabolome analysis, provide larger opportunity in increasing the productivity of oil palm. These methods are used to identify the markers associated with the key productivity related to phenotypes such as lipase biosynthesis, fruit bunch and disease resistance which are the main components affected the crop yields.

Dr. Chew summarized his presentation by saying that the integration of genetic tools consisting of network biology tools and traditional genetic toolsets offers more understanding on key processes controlling the complex multi-genic and interactive (gene gene, gene environment) nature of oil productivity, which then leads to more effective determination of genes controlling oil productivity.

The seminar was attended by 51 participants coming from various private and government educational and research institutions in Indonesia.

Dr. Chew is also SEAMEO BIOTROP's Governing Board Member representing Singapore as well as Editorial Board member of the Centre's scientific journal of tropical biology called BIOTROPIA.

- **Ecology and Conservation of Nepenthes Pitcher Plants**

Dr. Katja Rembold, a postdoc researcher on biodiversity, ecology and conservation of tropical rain forest ecosystems at the University of Goettingen in Germany, expounded on the above topic on 15 February 2018.

Dr. Katja explained the complex ecology, animal-plant interactions and conservation of Nepenthes pitcher plants. While the Nepenthes pitchers are a death trap for some animals, Dr. Katja revealed that they also provide a habitat for others such as mosquitoes that spent at least certain stages of their live within the pitchers, which makes each pitcher a little ecosystem on its own. The pitchers also become a shelter for spiders to protect itself from predators. In addition, rats, birds and frogs are known to look for their preys around the flowering Nepenthes population. In terms of symbiosis, ants are well-known to have mutualism relationship with Nepenthes. The ants help the plants to digest the meals and supply more nitrogen through their feces, while the plants provide the ants with the food from the nectar.

Dr. Katja emphasized that wild collections and habitat loss become the main threats to these interesting plants of which many species are already under risk of extinction according to International Union for Conservation of Nature and Natural Resources (IUCN) Red List. In order to save and protect the plants, Dr. Katja encouraged several conservation efforts that need to be done such as collecting the seeds from wild plants and planting them in a conservation area such Botanic Garden as well as by using tissue culture technology.

The seminar was attended by 55 participants coming from various educational and research institutions in West Java.

- **Nanotechnology Research in Indonesia: Status, Prospects and Challenges**

The Centre featured Prof. Dr. Nurul Taufiqu Rochman, M.Eng., a nanotechnology researcher at the Research Center for Physics of the Indonesian Institute of Sciences (LIPI), as a speaker on the above topic on 29 June 2018.

Prof. Nurul discussed four main points related to the topic, namely: Introduction to nanotechnology, Current status of nanotechnology development in Indonesia, Indonesia from nanotechnology perspective, and Nanotechnology commercialization in Indonesia.

As a tropical country, Prof. Nurul emphasized that Indonesia possesses abundant natural resources such as minerals and a wide variety of flora and fauna species which are the raw materials for nano-based products. He added that Indonesia, as the 4th largest populated country in the world, has to take advantage of the benefits of nanotechnology because this technology is believed to become the next industrial revolution and to increase the added value of Indonesian natural resources. He pointed out that an appropriate strategy is required to maximize Indonesia's potential and capability in advancing this technology.

Prof. Nurul reported that there are now 150 industries in textile, ceramics, chemistry, consumer goods, ICT, automotive and foods areas listed by the Ministry of Industry and Indonesian Society for Nano which apply nanotechnology. These industries produce over 2,200 nanotechnology-based consumer products which are already available in Indonesian market. Although many industries apply this technology in their products, Prof. Nurul lamented that human resources for nano-based R&D in Indonesia are still few due to the import technology used in their production. The nano-products are also only small portion in the production line, he added.

To support and facilitate more the nano-based research, the Indonesian Society for Nano was established in April 2005 and composed of more than 500 young researchers from many national research institutions (government institutions, universities, private sectors) in interdisciplinary of nanotechnology. The Society is headed by Prof. Nurul.

"Nanotechnology development must also be directed to manage and add value to Indonesian natural resources significantly to fulfill all domestic needs while, at the same time compete with other global products to increase national competitiveness," Prof. Nurul recommended. He also conveyed that a good synergy between academic-business/industry-government as well as networking with foreign research institutions are urgently needed to support and accelerate nanotechnology development in Indonesia.

The seminar was attended by 50 participants coming from various research institutions, ministries and companies in Indonesia.

SEAMEO BIOTROP Online Training Program

As part of its 10th FYDP as well as to contribute to Addressing Barriers to Inclusion as the second priority area of SEAMEO, the Centre's Capacity Building program has targeted to conduct at least three different online training courses yearly.

For the fiscal year in review, the Centre conducted two online training courses on Urban Agriculture as among the online training courses offered in SEAMEO's Southeast Asian Creative Camp in 2018.

The online training courses on Urban Agriculture were conducted from 22 February to 22 March 2018 (1st offering) and 21 May to 05 June 2018 (2nd offering) in cooperation with the Directorate of Technical and Vocational Education of Ministry of Education and Culture of the Republic of Indonesia and SEAMEO Secretariat. This online training course is aimed to enhance the awareness and understanding of target participants on the basic concepts of urban agriculture and provide them with working knowledge on several urban agriculture technologies that could be implemented according to their existing local conditions and environment. A total of 756 students and teachers, divided into 128 teams, from 90 High Schools and Universities in Indonesia, Malaysia, Philippines and Thailand joined the courses.

The course consisted of the following topics: (1) Introduction to the concepts and principles of Urban Agriculture (2) Aquaculture Production Techniques and Practices (3) Solid Organic Waste Management and Composting, (4) Hydroponics and Aquaponics Production Techniques and Practices, (5) Soil-based Vegetable and Fruit Tree Gardening, (6) Oyster Mushroom Production, (7) Agri-based Business Development and Implementation, and (8) Documentation and Reporting of Best Practice in Urban Agriculture. The resource persons consisted of SEAMEO BIOTROP officials and researchers and affiliated scientists from Institut Pertanian Bogor (IPB).

The participating teams were required to develop proposals to implement an urban agriculture project or improve their existing urban agriculture practices in their respective schools.

REGIONAL VISIBILITY

Forging Ahead with Tropical Biology
for Environmental and Societal Transformations
in Southeast Asia (Tropical BEST-SEA)

RECOGNITION AND BENCHMARKING

Partnership and Linkages

SEAMEO BIOTROP develops partnerships to enhance its organizational breadth and depth in terms of sharing of expertise and resources with leading educational institutions, private enterprises, and government and non-government organizations.

During the fiscal year in review, the Centre established 23 new national and regional Memoranda of Understanding and Agreements (MoU/A) with various institutions for conducting joint-research programs and learning events, developing and enhancing professional skills and providing technical assistances (*Appendix 3*).

At the international and regional levels, SEAMEO BIOTROP formalized collaboration with the International Center for Tropical Agriculture (CIAT) on 1 September 2017 with special focus on sustainable agriculture development and with the Institute of Brunei Technical Education (IBTE) on 22 May 2018 with special focus on agricultural technology and entrepreneurship.

At the national level, SEAMEO BIOTROP sealed MoUs with two educational institutions and city government. These include the Universitas Satya Negara Indonesia (USNI), Forestry Vocational School Bakti Rimba Bogor, and the City Government of Bogor.

The collaboration with USNI will cover: (1) joint research and training activities; (2) provision of technical advice in research and development; (3) exchange of information materials; and (4) scientific staff and student exchange and consultations on relevant research on tropical biology with special focus on Fisheries and Marine Science. The MoU was signed on 20 March 2018 and is effective for three years.

The agreement with Forestry Vocational School Bakti Rimba Bogor aims to improve the quality of forestry education through forestry competency test activities, fieldwork practices and internships. In addition, BIOTROP will also transfer its knowledge, experiences and technologies to the school for developing and managing forest resources in its surrounding environment. The MoU was signed on 4 July 2018 and is valid for three years.

The MoU with the Bogor City Government signed on 12 February 2018 aims to facilitate socioeconomic development in the City through research and technology transfer, lifeskills capacity building, and information exchange in support of the City's Green Bogor Program. Specifically, both parties agreed to focus on the following projects for the next three years: (1) establishment of Bogor City as a School Garden City by training school teachers at all levels and developing teaching-learning materials on agri-based technologies available at the Centre toward improving students' literacy, nutrition and entrepreneurship; (2) development and dissemination of appropriate technology for community empowerment with special focus on urban agriculture, and (3) application of GIS and remote sensing technologies for urban planning, agriculture development, and biodiversity health monitoring. Prior to the MoU signing, SEAMEO BIOTROP conducted a focus group discussion in August 2017 with district officials of South and East Bogor and heads of five villages which would be the Centre's new community outreach sites under the collaboration. To kick off the implementation of establishing Bogor as a School Garden City, the Centre will be inviting at least 15 schools from Bogor to participate in the Centre's third offering of its training course on school garden for improving students' literacy, nutrition and entrepreneurship to be held in July 2018.

Expert Consultancies

SEAMEO BIOTROP Experts have also been invited to provide consultancy services to government agencies and private institutions in Indonesia during FY 2017/2018. The activities wherein the Centre's staff members provided technical assistances during the period in review were as follows:

1. "Seminar on Gaharu: The Future" on 20 - 23 July 2017 organized by ORGANICCAP, Malaysia, through Mr. Jonner Situmorang, M.Si. as resource person.
2. "Seminar-Workshop on Coaching of Extracurricular Activities in Elementary Schools" on 21 July 2017 organized by the Directorate General of Elementary and Secondary Education, Ministry of Education and Culture of Indonesia, through Ms. Rosianadewi Dinaryanti, M.Si. and Ms. Riana Hartati, S.Si. as resource persons.
3. "Training on Vegetable Cultivation and Nutrition Garden Monitoring of SEAMEO RECFON" on 24 July 2017 at SEAMEO RECFON, Jakarta, through Mr. Didi Junaedi, A.Md. as resource person.
4. "Training on the 2nd Phase of Geographic Information System (GIS) for the Improvement of Government Capacity in PMAP#7 Project Working Area" on 7 - 11 August 2017 organized by Land Equity International Pty Limited, Pekanbaru, through Mr. Harry Imantho, M.Sc. as resource person.
5. "Training on Competence Improvement for SLB Teachers and Inclusion of Cooperation of PPPPTK TK and PLB with SEAMEO SEN" organized by The Centre for the Development and Empowerment of Educators and Educational Personnel for Kindergarten and Special Education on 13 - 14 November 2017 at Bandung, through Ms. Riana Hartati, S.Si. as resource person.
6. "Training on Management and Technical Understanding of ISO / IEC 17025: 2005" on 15 - 17 November 2017 in Bali organized by Sea Research and Observation Centre, Ministry of Marine and Fisheries, through Ms. Santi Ambarwati, M.Si. as resource person.
7. "Training on Hydroponics" on 23 November 2017 organized by Educational Service, Government of Tangerang City, Banten, through Ms. Riana Hartati, S.Si. as resource person.
8. "Workshop on Preparation of 3rd FYDP 2020/2021 - 2021/2025" on 27 - 29 March 2017 organized by SEAMEO QITEP in Science in Bandung, through Dr. Jesus C. Fernandez as resource person.
9. "Workshop on Writing Clinic in Reputable International Journal for Lecturers of Faculty of Agriculture, Universitas Sultan Ageng Tirtayasa, Year 2018" on 28 - 29 March 2018 at Universitas Sultan Ageng Tirtayasa, Banten, through Ms. Tika Tresnawati, M.Si. as resource person.
10. "Training on Hydroponics" on 29 March 2018 at Universitas Trisakti, Banten, through Ms. Riana Hartati, S.Si. and Mr. Budiyono as resource person.
11. "Training on Entrepreneur-based School" on 7 - 8 April 2018 in Malang, organized by the Directorate General of Elementary and Secondary Education, Ministry of Education and Culture, through Mr. Samsul A. Yani, S.Si. and Mr. Jonner Situmorang, M.Si. as resource persons.
12. "Spatial Areal Planning as a Utilization of Silvopastura Regions" on 15 May 2018 organized by the Directorate General of Sustainable Production Forest Management, Ministry of Ministry of Environment and Forestry, Jakarta, through Dr. Irdika Mansur, M.Sc. as resource person.
13. "Technical Guidance on SMK Pertanian Development Aid for Supporting Food Security 2018" on 5 June 2018 in Jakarta, organized by Directorate General of Elementary and Secondary Education, Ministry of Education and Culture, through Dr. Irdika Mansur as resource person.
14. "Training on Development of Life Skills Education for Islamic Boarding School" on 28 - 30 June 2018 in Bogor, organized by Ministry of Religious Affairs, through Mr. Samsul A. Yani, Ms. Riana Hartati, S,Si, and Ms. Dewi Yuniati, M.Si. as resource persons.

Students Internship/On the Job Trainings

In line with the Ministry of Education and Culture's mission, SEAMEO BIOTROP supports the improvement of knowledge, skills and understanding of school students through internship. The Centre also provides the opportunity for joining on-the-job training for university students and staff of the institutions concerning tropical biology.

In FY 2017/2018, the Centre accommodated 232 students and officials from 64 learning institutions for their internship and/or on-the-job training (*Appendix 4*). This number is broken down as follows: 92 high school students, 15 vocational school/diploma students, 147 university students, and 12 research centre staff.

These internships and/or on-the-job trainings were on the following areas: silviculture, entomology, hydroponic, natural products, biotechnology, herbarium, waste management, tissue culture, food and feed analysis, mushroom cultivation techniques, geographic information system, information technology and office administration.

Moreover, the Centre also facilitated 22 undergraduate students from 5 universities to conduct their research.

Visitors

During the fiscal year in review, SEAMEO BIOTROP accommodated 58 visits consisting of 3,348 people from various schools, universities, government agencies, private companies as well as regional/international institutions. Through these visits, the Centre established working relationships with most of these organizations.

Three scientists from the International Centre for Tropical Agriculture (CIAT) of Vietnam discussed with SEAMEO BIOTROP Director and Deputy Director for Program on 13 July 2017 the possibility of conducting collaborative projects on the cultivation of root crops and cacao/ coffee in the context of climate change.

Thirty members of the ASEAN Korea Environmental Cooperation Unit (AKECOP) visited the Centre on 7 December 2017 to discuss possible collaboration in the field of forest biodiversity. The visitors got interested on the Centre's research storage insect pest management, forest rehabilitation using Jabon, and essential oil production.

The Centre's land mining bioremediation research attracted 12 lecturers from National Pingtung University Science & Technology of Taiwan to visit the Centre on 20 February 2018.




Four representatives from the newly established SEAMEO Regional Centre on Technical Education Development based in Cambodia visited SEAMEO BIOTROP on 9 May 2018 to conduct comparative study in the field of research, capacity building, knowledge and facilities management.

Dr. Didik Suhardi, Secretary General of the Ministry of Education and Culture (MoEC) of Indonesia, made a half-day visit to SEAMEO BIOTROP on 5 September 2017. The visit was part of his familiarization duty to get to know better the programs and activities of SEAMEO Centres in Indonesia as well as to promote closer collaboration with the MoEC in implementing the 3-year program of the Education and Culture Minister of Indonesia, Prof. Dr. Muhadjir Effendy, M.A.P., as the current SEAMEO Council President. After the tour, the Secretary General requested the Centre to provide training to MoEC staff on proper waste management and production activities for those who will be retiring soon.


INFORMATION EXCHANGE

SEAMEO BIOTROP's information exchange function is critical in promoting its research findings and capacity building programs and activities, and other services for the benefit of its stakeholders throughout the Southeast Asian region.

Books and Proceedings

The Centre produced books and proceedings during the fiscal year in review through the funding support from the Government of Indonesia (DIPA) (*Appendix 4*). The titles and brief summary of the books are as follows:

- Book on "Debu dan partikel dalam udara ambien dari permukaan tanah: Kumpulan Hasil Penelitian [Dust and particles in ambient air from the ground surface: Collection of Research Results]" by Arief Sabdo Yuwono and Wiranda Intan Suri

  Dust and particles are air pollutants that can have a serious impact on the health of humans and other organisms. Each size of dust and particles causes various impacts that interfere with the biological functions of living organisms around them. This book is a summary of various research results in Indonesia which is aimed to provide information about the formation of dust and particles, and various impacts of dust and particles involving various types of soil. It is also intended to raise interest among readers to maintain the quality of the natural environment, including ambient air quality, to become more habitable for all living creatures.

- Book on "Pengolahan dan analisis data spesial menggunakan perangkat lunak open source QUANTUM GIS [Special data processing and analysis using QUANTUM GIS open source software]" by Harry Imantho and Haritz Cahya Nugraha

  This book provides clear and detailed guidance of the process of data preparation, processing and analysis as well as the presentation of maps to support decision-making processes. It emphasizes understanding and direct practice to improve soft skills in managing and utilizing spatial data. Spatial data processing and analysis materials presented in this book are important foundations for the implementers who work directly in the process of compiling the spatial planner map.

- Book on "Praktik pengelolaan limbah padat dan B3 (Bahan Berbahaya dan Beracun) di Jakata, Bogor, Depok dan Bekasi [Practices in the management of solid and B3 (Hazardous and Toxic Materials) waste in Jakata, Bogor, Depok and Bekasi]." 330p. By: Arief Sabdo Yuwono, Wiranda Intan Suri

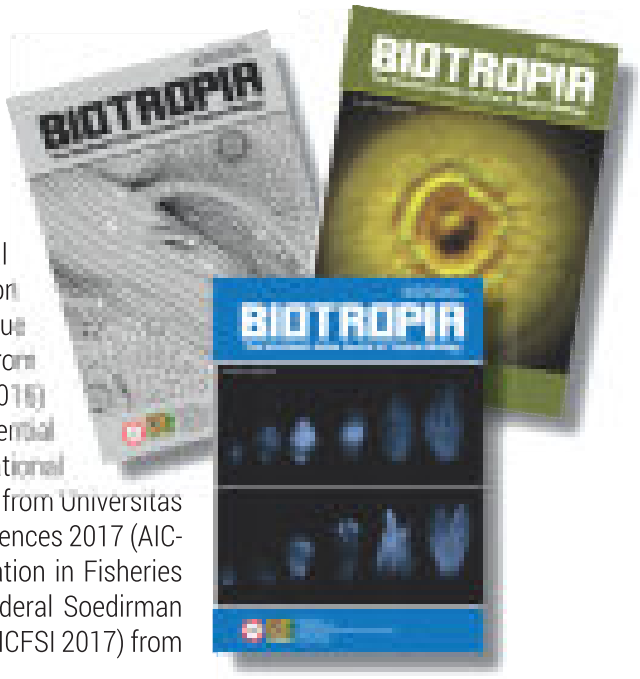
  Practices in managing solid and B3 (hazardous and toxic materials) waste vary widely in various parts of Indonesia. This variation is due to the habits of the community in managing the waste they produce which have been going on for years. Solid and B3 waste must be treated in a special way so that the processed products become harmless to the environment. As a regional institution focusing in research related to tropical biology, SEAMEO BIOTROP has an interest in maintaining environmental quality. Solid and B3 waste treatment is one of the studies under the SEAMEO BIOTROP research program in order to improve the quality of ecosystems. This book contains the practices of solid and B3 waste management including the management tools in the district/city government structure, available facilities and infrastructure, transportation systems, processing technology, and concise discussions in Jakarta, Bogor, Depok and Bekasi areas.

- Proceedings of National Seminar on Land Restoration for Sustainable Land Productivity 26 - 27 September 2016 edited by Dewi Wulandari

  This seminar proceedings contains 12 articles on the recent issues, research gaps and possible solutions to land degradation. The seminar covered the following themes: (1) Utilization of soil microorganisms to enhance land productivity of degraded land; (2) Soil physics and chemical improvement to enhance land productivity of degraded land; and (3) Plant and plant breeding as bioremediation approach. Papers in this proceeding were selected after peer-review process.

Journals and Newsletters

• BIOTROPIA



In relation to SEAMEO BIOTROP's 10th FYDP target of expanding the subject matter coverage, frequency of publication and readership of the Centre's journal, BIOTROPIA Editorial Board decided to collaborate with international conference organizers in publishing conference papers in the broad areas of tropical ecosystems and environmental impacts, biodiversity conservation and sustainable development and biotechnology as a special issue of BIOTROPIA. As a result of this, the Centre received requests from 1st International Conference on Marine Biodiversity (COMBI 2016) from Universitas Udayana, 1st International Conference of Essential Oil Indonesia (ICEO 2017) from Universitas Brawijaya, 3rd International Conference of Indonesia Society for Remote Sensing (ICOIRS 2017) from Universitas Diponegoro, 7th Annual International Conference on Health & Life Sciences 2017 (AIC-HLS 2017) from Universitas Syiah Kuala, 2nd Scientific Communication in Fisheries and Marine Sciences 2018 (SciFiMaS 2018) from Universitas Jenderal Soedirman and 1st International Conference on Food Security Innovation 2017 (ICFSI 2017) from Universitas Sultan Ageng Tirtayasa.

During the fiscal year in review, the Centre published three issues of BIOTROPIA i.e. Vol. 24 No. 2, Vol. 25 No.1 and Vol. 25 No.2. The online version can be accessed at **http://journal.biotrop.org**.

The Centre had also disseminated copies of BIOTROPIA to 95 partner institutions, 170 libraries of national and international universities, and 40 subscribers from various national and international research institutions.

• BIOTROP Courier

Four issues of BIOTROP Courier, the Centre's quarterly newsletter, were published during the fiscal year in review (i.e. July-September 2017, October-December 2017, January-March 2018 and April-June 2018 issues).

The issues contain highlights of completed major activities of the Centre for the information of its stakeholders and the general public.

BIOTROP Courier is now available in the form of e-newsletter and distributed to 720 various national and international institutions, including partner institutions, research centres, libraries, universities, subscribers, exchange partners, schools and the interested public who belong to the Centre's regularly updated mailing list. This e-newsletter delivered via email is expected to gain rapid acceptance for the same reasons that email in general has gained popularity over printed correspondence.

- Articles, Technical Papers in Peer-Reviewed Journals and Proceedings

In FY 2017/2018 SEAMEO BIOTROP published 9 articles in peer-reviewed journals and an article in refereed proceedings. Most of these journal articles were the results of the scientists' research projects with the Centre that were funded through DIPA (*Appendix 5*).

Library Services and Database

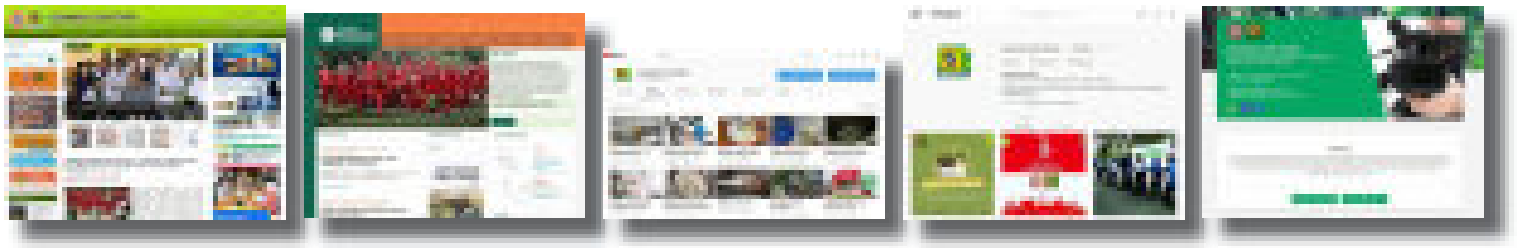
Currently, the Centre's library holds and manages 13,251 books and 17 e-books as library's collections. Catalogue of collections can be accessed through **http://lms.biotrop.org/opac.**

In FY 2017/2018, the library received a total of 114 person-visitors from national and regional/international institutions and 364 website unique visitors around the world. According to the recorded data, there were 90 online items downloaded by the library website visitors.

The Centre's library also received five books as gifts from various institutions. The Centre's library also registered 187 serial publications (journals, proceedings, newsletters, annual reports and magazines), consisting of 103 as gifts and 84 as exchanges.

A total of 132 new titles were added to the library database. They cover articles in refereed journals, books, monographs, articles and posters in proceedings, research and training reports, modules, journals and newsletters.

An accessible collection requires a modern library services platform and user-friendly tools that is comprehensive, attractive, and intuitive to use. To support this, SEAMEO BIOTROP library established a system called BIOTROP repository containing database of internal document/ grey literature available to be accessed by the public. Previously, this database can only be accessed internally.



Website Maintenance

The Centre website (**https://www.biotrop.org**) is an important outlet for articles and announcements on the Centre's research, capacity building activities, services, and other development initiatives. During the fiscal year in review, 146 articles were uploaded in BIOTROP's website consisting of 49 articles on the Centre's activities, 3 highlights of research results, 27 articles on events of SEAMEO Secretariat and other SEAMEO Centres and partner institutions and 2 book reviews. On the other hand, 14 information updates were also uploaded on the new Centre's publication section (e.g. proceedings, books, research reports, training/ seminar reports, newsletters, annual report and selected photo gallery).

This year, the unique visitors of BIOTROP website increased by 18.11% compared to visitors in FY 2016/2017.

In 2017, the Centre's virtual knowledge management centre on tropical biology (**http://kmtb.biotrop.org**), which provides exhaustive knowledge and information in line with the Centre's program thrusts, featured 4 articles on Community Welfare and 8 News on Environmental Integrity. Beginning of 2018, the Centre accommodated articles on its new program thrusts under its 10th FYDP. Thus, the website published 6 articles on Restoration of degraded ecosystem; 7 articles on Sustainable Management of Intensively Used Ecosystems/Landscapes; and 1 article on Conservation and Sustainable Use of Unique Ecosystems/Landscapes of High Biodiversity.

The Centre's Spatial Information & Services Website (**http://spatial.biotrop.org**) published 14 articles on spatial news and 13 articles on spatial application during FY 2017/2018.

Expert System Development

SEAMEO BIOTROP decided to develop an expert system for Identification and Management of Invasive Alien Plant Species (IAPS). This project is one of the targets under the Centre's 10th FYDP (2017 - 2022).

A focused group discussion among BIOTROP IAPS experts and expert system team was conducted to identify problems and assess current information available on IAPS towards developing the expert system prototype. The Centre expects to generate the expert system prototype by end of 2018 and testing of it by target users to be done in early 2019.

Promotion and Media Exposure

The efforts to increase access to SEAMEO BIOTROP's program, facilities and services were sustained during the fiscal year in review to provide accurate and comprehensive information about the Centre to the public. This was carried out through various promotional materials, media releases, attendance to exhibitions and visits to relevant institutions.

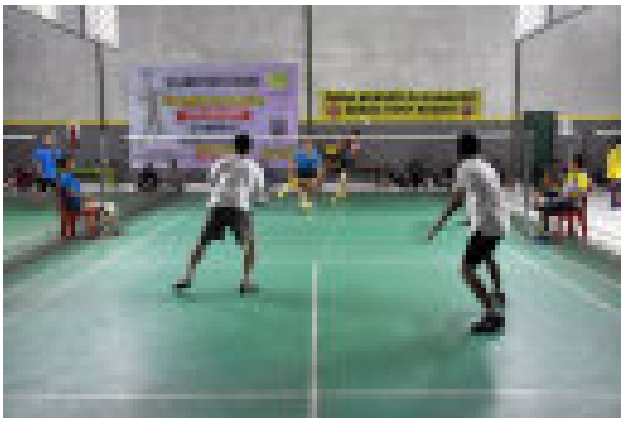
The Centre published a total of 50 news articles in online and printed mass media. This is 150% accomplishment from the target for FY 2017/2018.

During the Centre's Golden Anniversary Day held on 27 February 2018, over 20 national and local media partners witnessed the event. This generated online and printed articles mostly highlighting the launching of a collaborative program between MoEC and SEAMEO BIOTROP on Non-Seasonal Fruit Production for the Revitalization of Vocational Schools in Indonesia.

The first inter-SEAMEO Centre Badminton Tournament in Indonesia held on 25 - 26 June 2018 was also published in the 36th edition of Bulutangkis Indonesia magazine, a special magazine for Badminton which is widely circulated in Indonesia. This event was also conducted as a part of the Centre's Golden anniversary celebration.

The Centre also participated in some educational exhibitions such as during the 49th SEAMEO Council Conference (SEAMEC) and Strategic Dialogue for Education Ministers (SDEM) on Education Agenda 3 on 24 - 27 July 2017 at Mulia Hotel, Jakarta; School Literacy Festival on 27-29 October 2017 at Indonesian Ministry of Education and Culture, Jakarta; and Education and Culture Exhibition of RNPK 2018 on 5 - 7 February 2018 at Education and Training Center (Pusdiklat) Sawangan, Depok.

A special report titled "Biodiversity untuk Anak Bangsa (Biodiversity for Children of the Nation)" highlighting the SEAMEO BIOTROP's research results adopted by communities was published in the Green Indonesia magazine, a magazine for climate and environmental change, it its 15th issue for 2018.



SMK PENGHASIL BUAH DAN SAYUR SEPANJANG MUSIM

SPECIAL PROGRAM

Collaborative Program on Non-Seasonal Fruit Production Development for Revitalization of Vocational Schools SEAMEO BIOTROP, MoEC-Indonesia

Dr. Didik Suhardi, Secretary General of the Ministry of Education and Culture (MoEC) of Indonesia, officiated on 26 February 2018 the launching of a collaborative program between MoEC and the SEAMEO Regional Centre for Tropical Biology (BIOTROP) on Non-Seasonal Fruit Production for the Revitalization of Vocational Schools in Indonesia. The program launching was a back-to-back activity with the opening of SEAMEO BIOTROP's Golden Anniversary celebration at its headquarter in Bogor with the theme "Forging Ahead with Tropical Biology for Environmental and Societal Transformations in Southeast Asia (Tropical BEST-SEA)".

Aside from making the vocational schools greener and beautiful, the said program is expected to increase the nutritional status of students and enhance the schools' productivity and entrepreneurship.

In his opening address, Dr. Didik Suhardi expressed his confidence and support for SEAMEO BIOTROP to transfer its research capabilities and technologies to help empower schools in their programs and activities such as the development of non-seasonal fruit gardens especially in vocational schools.

He also expected that through this program, SEAMEO BIOTROP can play an active role in the development of knowledge and technology that will make our vocational school graduates become reliable entrepreneurs who could help build the economy of Indonesia.

Fully funded by the MoEC, the program is among SEAMEO BIOTROP's flagship programs under its 10th Five Year Development Plan (FYDP) which were also launched at the opening of the golden anniversary celebration.

The program is now being carried out with 30 vocational school partners in 10 provinces in Indonesia.

Indonesian Biotechnology Information Center (IndoBIC)

IndoBIC has implemented one International Conference, three seminars, six coordination meetings, and three Focus Group Discussion during the period in review. The number of activities carried out by IndoBIC have increased significantly through the years due to more collaborations and partnerships developed with various government and private intitutions within Indonesia. IndoBIC's activities during the period in review were supported by several partner-institutions, namely: The International Service for the Acquisition of Agri-biotech Applications (ISAAA), Croplife Indonesia, Croplife International, Indonesian Agency for Agricultural Research and Development (IAARD) of the Ministry of Agriculture of Indonesia, the Coordinating Ministry of Economy, and the Indonesian Society for Agricultural Biotechnology (PBPI). A total of 3,700 individuals from government institutions, private sectors, academe, farming communities and media practitioners benefited from IndoBIC's activities.

Notable of these activities are the following:

- **Six Coordination Meetings on Roadmap For The Development and Application of Genetically Engineered Products In Indonesia**

The coordination meetings was aimed to develop a roadmap that can serve as a work plan bridge and strategic plan for the involved institutions and stakeholders in Indonesia. This roadmap is expected to provide guidance to relevant agencies and stakeholders in developing the production and utilization of domestic seed-produced of Genetically Engineered Products (GMP) in a sustainable manner to achieve food security and increase farmers' income in Indonesia. This was initiated by the Coordinating Ministry of Economy of Indonesia in collaboration with Indonesia Biotechnology Information Centre (IndoBIC).

• Seminar on Global Impact of Biotech Crops (Jakarta, 11 – 12 September 2017)

Over the last 20 year, crop biotechnology has significantly reduced agriculture's environmental impact and stimulated economic growth in the 26 countries where the technology is used. The innovative agricultural technology has contributed to preserving the earth's natural resources while allowing farmers to grow more, high quality crops. It has also helped alleviate poverty for 16.5 million, mostly smallholder farmers in developing countries. This was forwarded by Graham Brookes, director of PG Economics, UK during a talkshow for media practitioners and seminar on September 11 - 12, 2017, at Arya Duta Hotel, Jakarta, Indonesia.

Brookes delivered a report on the Global Impact of Biotech Crops: Economic and Environmental Effects 1996 - 2015. He mentioned that in 2015, farmers in developing countries received $5.15 for each extra dollar invested in biotech crop seeds, whereas farmers in developed countries received $2.76 for each extra dollar invested in biotech crop seeds.

Ms. Ignatia Maria Honggowati of the Coordinating Ministry of Economy Affairs talked about the Roadmap on the Use and Development of Genetically Engineered Product; Prof. Dr. Bambang Purwantara of Indonesian Biotechnology Information Centre (IndoBIC) presented the Global Status of Commercialized Biotech/GM Crops: 2016; while Prof. Dr. Bustanul Arifin of Institute for Development of Economics and Finance (INDEF) and Centre for Strategic and International Studies (CSIS) delivered talks on Prospects of Biotechnology Products for Strengthening the Indonesian Economy; and The Role of Biotechnology to Support Indonesia's Food Security: Potential to Increase Corn Production.

Some 100 participants from the Ministry of Agriculture, the Coordinating Ministry Economy Affairs, Ministry of Environment and Forestry, Ministry of Trade, representative of Biosafety Commission and the Technical Team, media practitioners and private sectors attended the two-day event. The event was conducted by a collaborative effort between IndoBIC and The Coordinating Ministry of Economy Affairs with support from Croplife Indonesia, and the International Services for the Acquisition of Agri-Biotech Applications (ISAAA).

- Seminar on Reflection and the Future of Agricultural Biotechnology in Supporting Food Sovereignty in Indonesia (Jakarta, 29 January 2018)

The seminar aimed to discuss the development of biotechnology in Indonesia until 2017 related to regulatory status and socio-economic benefits in particular; project the future of biotechnology products in Indonesia; and discuss the new advanced-agricultural technological developments in the world. Prof. Agus Pakpahan (Chairman of Biosafety Commission); Prof. Dr. Bayu Krishnamurthi; and Prof. Dr. Antonius Suwanto of Bogor Agricultural University; M. Arief Budiman, PhD. of PT Orion Biosains were invited as resource persons in this event. The event was attended by 80 participants from Government officers, scientists, private companies, and media practitioners.

SOLID RESOURCE BASE

Forging Ahead with Tropical Biology
for Environmental and Societal Transformations
in Southeast Asia (Tropical BEST-SEA)

ADMINISTRATION AND MANAGEMENT

Staff Development

SEAMEO BIOTROP is committed to develop the capabilities of its human resources in their respective areas of work and in general organizational competencies toward achieving the Centre's vision, mission, and goals.

Two Centre staff members earned their Master of Science degrees in Fisheries Science and Disaster Mitigation of Land Damage at Institut Pertanian Bogor during the fiscal year in review. They are Ms. Dewi Yuniati and Mr. Armaiki Yusmur, respectively. Moreover, three staff members, namely: Ms. Syifa Fauzia, Mr. Peri Siantuni and Ms. Lastiah successfully earned their Bachelor Degrees in Chemistry, Management, and Economics, respectively.

The Centre also provided staff development opportunities to 70 percent of its staff members which included attendance to training courses, conferences, seminars, workshops and symposia in Indonesia and abroad (*Appendix 6*).

These staff development activities consisted of 1 international, 3 regional, and 87 national events. One of these events was organized through the Centre's capacity development program coordinated by Human Resources Management Department, namely: Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011:2012. This activity was held as a preparation for the Centre to migrate from ISO 2008 to ISO 2015 version as well as the submission of ISO 9001:2015 reaccreditation in October 2018.

FACILITY IMPROVEMENT AND NEW EQUIPMENT

Having good physical facilities and laboratories enable the Centre to carry out its activities as well as attract collaborators. Thus, during FY 2017/2018, SEAMEO BIOTROP's Facilities Management Department focused on continuous improvement and optimized the use of office equipment and facilities for customers' satisfaction.

Towards the end of this fiscal year, the following improvements on the Centre's facilities were done:

- Maintenance of Jati Training and Meeting Room
- Reinstallation of HDPE Master Pipeline
- Renovation of Bathroom and Panel Room
- Renovation of MIT Building
- Maintenance of 13 Research Greenhouses
- Renovation of Seawater Laboratory
- Renovation of Entomology Laboratory
- Renovation of Woman's Restroom at Main Lobby
- Renovation of Mushroom Nurseries

PRODUCT DEVELOPMENT AND SERVICES

The Centre's Product Development and Services Department (PDSD) consists of 2 units, namely: Product Development Unit and Service Laboratory Unit. Product Development Unit is assigned to produce high quality commercial biological products, such as forest and fruit tree seedlings, food crops, ornamental plants, mushroom and organic fertilizer. The Services Laboratory Unit, on the other hand, is assigned to provide sample testing services covering waste water, air, plant and soil, mineral, as well as food and feed testing.

In FY 2017/2018, PDSD produced a total of 334,491 seedlings of Teak (*Tectona grandis*) and 32,885 of Banana (*Musa* sp.), Tin, *Eucalyptus*, Jabon (*Anthocephalus cadamba*), and Satoimo (*Colocasia esculenta* var. *antiquorum*) through tissue culture technique.

Based on the decree of the Head of the West Java Provincial Forestry Service number: 522.4/40/KPTS/PDAS-LUH, SEAMEO BIOTROP, through PDSD, has been appointed as provider and/or distributor of registered forest plant seedlings starting in 2018.

As part of its MoU with the Indonesian Ministry of Marine and Fisheries, SEAMEO BIOTROP produced as much as 35,000 seaweed calluses; 1,868 micropagules; and 14 tons of seaweed seeds, and have been distributed to 20 provinces in Indonesia. Seaweed tissue culture of SEAMEO BIOTROP, through the intermediary of the Lombok Aquaculture Fisheries Center, has also been distributed to countries in the Pacific Islands: namely Micronesia, Fiji and Kiribati.

Also in 2018, PDSD conducted several research works and successfully managed to find method for sterilization and bud induction for propagation of new varieties including: *Anubias* sp., strawberries, Matoa and Saninten. Research for Matoa and Saninten was conducted under the non-seasonal fruit production program for the revitalization of vocational schools in Indonesia. Both of these fruits are almost rare with high economic value.

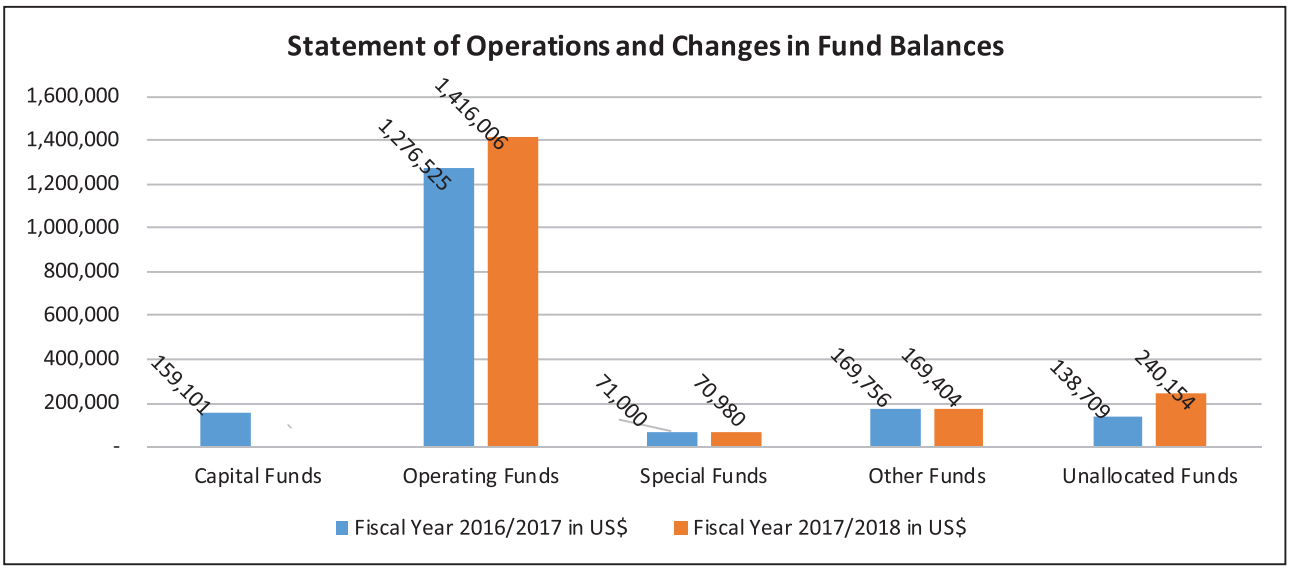
PDSD also produced 44,014 baglogs of oyster mushroom (*Pleurotus ostreatus*) and wood ear mushroom (*Auricularia auricula*) which were distributed to private companies and individual clients. This year, the department has started conducting a research to develop straw mushroom (*Volvariella volvacea*) cultivation method.

Financial Viability

In fiscal year (FY) 2017/2018, SEAMEO BIOTROP received US$ 1,416,006,– as Operating Fund from the Government of Indonesia (GoI) to cover staff salary and wages, operational expenses, and building and equipment maintenance. This amount is 10.93% higher than the previous fiscal year's allocation. The Centre also received the annual Special Education and Development Fund (SEDF) of US$ 71,000 from SEAMEO Secretariat which is intended for conducting regional and international trainings and seminars, research, Governing Board Meeting (GBM), and personnel exchange. After deducting bank administrative charges, the Centre received a net SEDF amount of US$70,980.

During the FY in review, SEAMEO BIOTROP did not receive Capital Fund from the GoI due to general government regulation. However, the Centre enabled to increase its Unallocated Funds by 73.14% from FY 2016/2017 as the result of the Centre's income generating activities. On the other hand, the Centre's Other Funds significantly decreased by 0.21% as the result of the outstanding cash that have not been liquidated as per 30 June 2018.

The statement of operations and changes in fund balances for FY 2017/2018 compared to FY 2016/2017 is summarized below:



NEXT YEAR'S PROGRAM AND ACTIVITIES

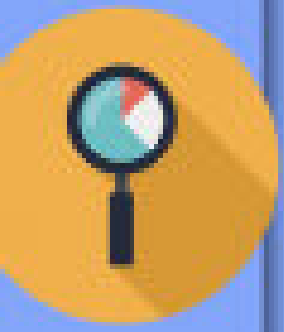
Next Year's Program and Activities

The Centre looks forward to implementing the programs and activities identified under its 10 FYDP in the coming fiscal year under its three main mandates as follows:

A. Research

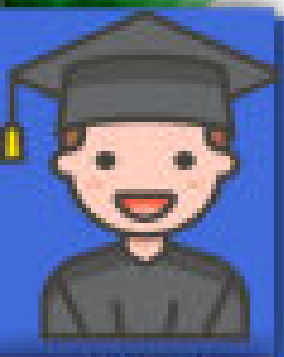
a. SEAMEO BIOTROP Short-Term Scientist Exchange Program

This Program aims to facilitate collaboration between SEAMEO BIOTROP scientists and researchers with focus from partner-institutions in Southeast Asia toward generating research outputs relevant to addressing pressing concerns in biodiversity and environment in the region and, in the process, strengthening professional and institutional networking among them.



b. Intensification of SEAMEO BIOTROP's In-house Staff Research, Joint Research, PhD Thesis Grants Programs and Youth Environmental Outreach Grants Programs

SEAMEO BIOTROP shall continue to support the generation of quality research outputs related to its program thrusts that are relevant for application in SEAMEO member countries through its in-house staff research, joint research, PhD thesis grants and Youth Environmental Outreach Grants Programs.



B. Capacity Building

a. Expansion of SEAMEO BIOTROP's Internship Program for undergraduate and graduate students from other SEAMEO member countries

SEAMEO BIOTROP shall welcome internship of undergraduate and graduate students within and outside Indonesia to provide them with practical exposures and develop their professional ethics and networking within their chosen fields of specialization through the mentoring of BIOTROP affiliated scientists.

b. Offering of New Training Courses

SEAMEO BIOTROP shall offer new face-to-face and online training courses to address the Centre's new program thrusts towards achieving its vision and mission, and to expand the technical service coverage of the Centre in building capacities of a more diverse range of its stakeholders in the region.

c. **Intensification of the Training Program on Improving Student Literacy, Nutritional and Entrepreneurship through School Garden Among Primary and Secondary Schools in Southeast Asia**

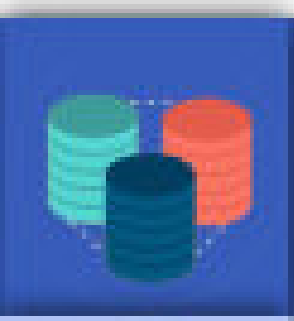
Started in 2015, this Program aims to institutionalize school garden as a learning mechanism in the curricula of primary and secondary schools in Southeast Asia towards improving student literacy and nutrition.

d. **Schools Productivity for the Development and Upliftment of Communities and the Environment (Schools ProDUCE) Program**

This Program is meant to empower schools to perform not only its educative function but also to become agents of change in bringing about economic, social, and environmental development in the region through vegetable and fruit production and processing, aquaculture production, animal husbandry and forestry production.

e. **Sustaining the Implementation of Quarterly Public Seminar Series**

The Centre hopes to invite more experts within and outside Southeast Asia as speakers in this quarterly public seminar series and strengthen the communities of practice in various aspects of tropical biology.



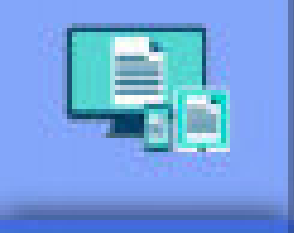
C. Information Exchange

a. **Development of new databases based on BIOTROP's areas of expertise**

SEAMEO BIOTROP expects to develop at least two new databases on mycorrhiza and alfalfa management based on research results of its in-house scientists and researchers from partner-institutions.

b. **Development of Expert Systems**

The Centre's Expert Systems Development Program aims to improve public awareness and participation in addressing issues and concerns on tropical biology. For the next five years, the Centre will develop two expert systems for early detection, control and prevention of Invasive Plant Species (IPS), and Pests of Storage Products.



c. **Publication of SEAMEO BIOTROP Policy Briefs**

Through this Program, SEAMEO BIOTROP hopes to provide inputs and contribute to the decision/policy-making processes of government institutions engaged in tropical biology and establish the reputation of the Centre as a source of reliable scientific information.

d. **Books and Special Publications Program**

The Centre will continue to produce quality reference materials for the Centre's stakeholders on specific subject matters generated from the research works of the Centre and those of partner-institutions.

APPENDICES

Forging Ahead with Tropical Biology
for Environmental and Societal Transformations
in Southeast Asia (Tropical BEST-SEA)

Appendix 1. SEAMEO BIOTROP's Research Project in FY 2017/2018

No	Titles of Research Project	Researcher/s	Objectives	Target Beneficiaries	Output and Impacts Produced	Funding Sources	Partners
A. On - Going National Research Project from In-House Researchers and Partner Agencies							
1.	Study on Sengon (*Falcataria moluccana*) Resistance to Boktor Pest (*Xystrocera festiva*) and Gall Rust (*Uromycladium tepperianum*) Part III	Dr. Ir. Ulfah J. Siregar	a. To optimize construction of genomic library of sengon as materials to obtain full length sequence of resistance genes against pests and diseases b. To optimize construction of cDNA library for identification of expressed resistance genes by PCR and sequencing c. To study the expression of some sequenced gene(s) by RT-PCR d. To develop of new marker, e.g. SNiP, from sequence analysis	Scientific community, government institutions	a. To give information about new marker for sengon tree improvement and breeding b. To create publications in an international journal	GOI- DIPA	-
2.	The Balance of *Chromolaena odorata* and *Cecidochares connexa* Populations to Achieve an Effective Biological Control Output	Dr. Soekisman Tjitrosoedirjo	To study about population of *C.connexa* in reducing *C.odorata*'s population	Scientific community, government institutions, private enterprise and local community		GOI- DIPA	-
3.	Mint Oil Nanoformulations: Its effectiveness against *Tribolium castaneum* phosphine resistant strains	Dr. Idham Sakti Harahap	a. To generate the nano emulsion of mint oil and nano mint oil powder, the nanoformulations, database of phosphine resistance of stored-product insect pest in Indonesia b. To find out the best nanoformulations	Scientific community, government institutions, private enterprise	To create mint oil Nano formulation as alternative fumigant for pantry pest management and updated database about the spread of phosphine resistant strains of stored-product insects in Indonesia	GOI- DIPA	-

			c. To collect and test the status of resistance against phosphine stored-product insect samples that suspected resistant to phosphine from food and feed storages in the Province of West Sumatera, South Sumatera, and North Sulawesi				
4.	Development of Ecosystem Health Index in Indonesia	Prof. Dr. Ir. Arief Sabdo Yuwono, M.Sc.	a. To compile and mapping the health of aquatic ecosystems, terrestrial ecosystems and artificial ecosystems in selected areas of Indonesia b. To formulate a quantitative approach to an ecosystem health assessment system that can form the basis for national environmental policy making c. To develop a single index that represents the health of an ecosystem that includes aquatic, terrestrial, and artificial ecosystems using a quantitative approach	Scientific community, government institutions, local community	a. To get compilation of an ecosystem health index that includes aquatic, terrestrial and artificial ecosystem that can be applied in Indonesia b. To get publication in international scientific journals c. To create a guide book and software (electronic spreadsheet) of ecosystem health assessments	GOI- DIPA	-
5.	Application of Selected Native Beneficial Soil Microorganisms into Adapted Plant Species in Post Tin Mining, Bangka Island Indonesia	Dr. Dewi Wulandari	To evaluate the effectiveness of selected native beneficial soil microorganisms isolated by inoculate it into selected adapted economical plant species in post tin mining area	Scientific community, government institutions, private enterprise and local community	To give recommendation on the use of native beneficial soil microorganism as one of effective cheap environmental friendly method for degraded land restoration particularly in post mining such in tin mining area	GOI- DIPA	-

6.	Evaluation of Acoustic Technology for Quantifying and Mapping Tropical Seagrass Habitats in Bintan Seawater	Prof. Henry M. Manik, Ph.D.	a. To determine the viability of an acoustic technique for mapping edges of tropical seagrass meadows b. To assess the effectiveness of an acoustic technique for determining the biomass of seagrass c. To determine the effectiveness of an acoustic surveying technique for describing sediment type d. To assess the efficiency in mapping tropical seagrass habitats using acoustic techniques against current dive survey methods	Scientific community, government institutions, local community	To provide the potential acoustic instrument to determine relevant descriptors of seagrass habitat, including plant cover, plant height, and biovolume (area × percent cover × plant height)	GOI- DIPA	-
7.	Assessment of Population Structure and Genetic Diversity of The Indigenous Chicken Breeds in Indonesia and Malaysia to Support their Sustainable Utilization	Dr. Maria Ulfah, S.Pt. M.Sc.Agr.	a. To asses the genetic diversity and population structure of Indonesian and Malay indigenous chicken used complete sequence of mtDNA D-Loop region b. To investigate the relationship between Indonesian and Malay indigenous chickens c. To confirm the breed determination of Indonesian and Malay indigenous chickens	Scientific community, government institutions, private enterprise and local community	a. Providing data of genetic diversity and population structure of Indonesian and Malay indigenous chicken used complete sequence of mitochondrial DNA (mtDNA) D-Loop region b. Revealing the origin and relationship Indonesian and Malay indigenous chickens c. Providing a confirmation of breed determination of Indonesian and Malay indigenous chickens	GOI- DIPA	-

					d. Disseminating research results by depositing the chicken mtDNA D-Loop sequences on Genbank, and publishing research result on accredited journals or present it on scientific meeting (such as seminar)		
8.	Potency of Yeast As Biocontrol Agent of Ochratoxin a Producing Fungi and Its Effect on The Taste of Wet and Semi-Wet Processed Arabica Coffee	Prof. Dr. Okky Setyawati Dharmaputra	To obtain a potential yeast isolate as biocontrol agent of ochratoxin A (OTA) producing fungi and its effect on the taste of wet and semi-wet processed Arabica coffee	Scientific community, government institutions, private enterprise and local community	To obtain a potential yeast isolate as biocontrol agent of ochratoxin A (OTA) producing fungi and as starter cultures used for wet and semi-wet processed Arabica coffee beans	GOI- DIPA	-
9.	Ecology, species composition and potential application of the enzyme extraction of marine wood borer from mangrove forest of Borneo	Dr. Farah Diba, S.Hut, M.Si.	a. To investigate the diversity, distribution and species composition of marine wood borer in mangrove area of Borneo b. To determine the environmental factors that influence the species composition abundance and distribution of marine wood borer c. To examine the cellulose and hemicellulose component in the wood borer that possibly have a potential to be applied in pharmaceutical industrial such as for new cosmetic product	Scientific community, government institutions, private enterprise and local community	To examine the ecology, distribution and species composition of marine wood borer from different location in Borneo island and will be among the pioneer research to examine and to extract enzyme from marine wood borer for the application in pharmaceuticals and cosmetic industry	GOI- DIPA	-

			d. To promote the potential of marine wood borer as edible and exotic seafood for local communities				
10.	The Use of *Hermetia illucens* for Sustainable Cocoa Farming: Cocoa Pod Husk Bioconversion to Feed Supplement	Dr. Ir. Siswanto, DEA	a. To obtain waste reduction index, efficiency of conversion of ingested food, and relative growth rate of BSF b. To obtain nutrient composition of BSF larvae and use the data to formulate the feed for goat c. To obtain the optimal formulae of ration mix with BSF d. To compare the feeding treatments and select the best treatment based on feed and nutrient intake, rumen fermentation characteristics and goat's performance	Scientific community, government institutions, private enterprise and local community	a. To establish BSF organic waste processing system in cocoa farm as a part of cocoa sustainable farming system b. To formulate the appropriate feed for goat	GOI- DIPA	-
11.	Heavy Metal Accumulator Plants For Gold Mining Phytoremediation Program: Morpho-Physiological and Histochemical Analysis	Dr. Ir. Hamim, M.Si.	a. To analyse morphological, anatomical and physiological characters of several plants in response to heavy metal contaminant b. To identify the location and entry path of metal accumulation in these plants c. To analyse further prospect of these plants in phytoremediation of heavy metal contaminated land in gold mining area	Scientific community, government institutions, private enterprise and local community	a. To get the data of morphological, anatomical and physiological characters of plants in response to heavy metal contaminant exposed by water culture b. To get the data of bio-accumulator capacity of the treated plants c. To get the potency of selected plants as phytoremediator of gold mining lands	GOI- DIPA	-

					d. To get two papers published in International Journal (BIOTROPIA or other journal)		
B. On – Going Research Project from PhD Thesis Support Grantees							
1.	Study on establishment of new ecosystem and its relation with their feeding ecology : An attempt of sea ranching of *Holothuria atra*	Ir. Retno Hartati, M.Sc.	a. To determine best stocking density for sea cucumber ranching b. To measure the biological, physical, chemical characteristic of the habitat of ranching *H. atra* c. To understand the process of habitat establishment in the habitat of sea raching for *H. atra* d. To understand acclimation process in a new habitat of post-release of *H. atra* e. To measure the performance (growth and survival rate) of *H. atra* in new habitat of sea ranching	Scientific community, government institutions, private enterprise and local community	a. To get performance of sea cumber stocked with different stocking density and stocking time b. To get paper presented in National/international seminar c. Two articles submitted to 2 international journal	GOI- DIPA	-
2.	An Integration of Stingless Bees and Nutmeg Plants (*Myristica fragrans* Houtt) to Increase the Efficiency and Sustainability of Honey Production in West Halmahera Regency	Hearty Salatnaya	To determine the types of stingless bee and analyze the characteristic of stingless bee production that is integrated with nutmeg plants in West Halmahera Regency	Scientific community, government institutions, private enterprise and local community	a. To obtain the type of stingless be in West Halmahera Regency which will be published in the national journal b. To get integration between stingless bee and nutmeg to increase the production of nutmeg plants to be published in international journals	GOI- DIPA	-

					c. To get the collaboration that expected to increase public interest to consume honey so that will increase the marketing and the cultivation sustainability		
3.	The Analysis of Microsatellite DNA Polymorphisms as A Base of Concervation of Local Swamp Buffalo of Southeast Sulawesi	Muh. Rusdin	a. To identify microsatellite DNA polymorphisms of local swamp buffalo of Southeast Sulawesi b. To identify genetic markers of local swamp buffalo of Southeast Sulawesi based on three locus of microsatellite DNA c. To estimate genetic distances among the local swamp buffalo subpopulation of Southeast Sulawesi and their comparison with three of other populations of local Indonesian swamp buffalo based on microsatellite DNA polymorphisms	Scientific community, government institutions, private enterprise and local community	a. To create information of genetic diversity, genetic markers, phylogeny relationships, and genetic distances among subpopulations of local swamp buffalo of Southeast Sulawesi compared to three of other populations of local Indonesian swamp buffalo based on microsatellite DNA polymorphisms b. To publish the research result in International Journal indexed by Scopus	GOI- DIPA	-
4.	Modelling Jakarta Bay Small-Scale Fisheries Sustainability Using Social Ecological System Framework	Robin	a. To analyze the fisheries ecological footprint at Jakarta Bay ecosystem and its relation to fishermen livelihood vulnerability b. To analyze the sustainability of fisheries using embodied energy (emergy) approach c. To develop a management model for fisheries sustainability	Scientific community, government institutions, private enterprise and local community	a. To create models and scenario development for small scale fisheries in Jakarta Bay b. To know the level of vulnerability and resilience of the fishermen community according to their existing condition	GOI- DIPA	-

			using social-ecological system approach		c. To get energy flow for small scale fisheries in Jakarta Bay ecosystem d. To determine carrying capacity and ecological footprint level of the Jakarta Bay ecosystem e. To publish two papers in international journal indexed by Scopus and at least one journal for ecological footprint will be published f. To publish one paper in national journal indexed by DIKTI or LIPI		
5.	Trophic Structure of Macrozoobenthos Community on Mangrove Ecosystem	Ananingtyas Septia Darmarini	a. To describe a certain of distribution, richness, and diversity of macrozoobenthos b. To describe reveal trophic structure based on stable isotope δ13C and δ15N ratio approach c. To analyze trophic relationships in communities	Scientific community, government institutions, private enterprise and local community	a. To get distribution, diversity and abundance of macrozoobenthos species in mangrove ecosystems Lubuk Damar b. To find the dominant source of macrozoobenthos food and shows trophic level (isotope δ13C and δ15N) of macrozoobenthos community in mangrove ecosystem c. To find the benthic biota based on biomass and feed sources that can be developed economically	GOI- DIPA	-

					but still maintain ecosystem sustainability d. To publish research results in international journal 1) Distribution, richness and diversity of macrozoobenthos in Lubuk Damar Aceh Tamiang, 2) Trophic structure of macrozoobenthos on mangrove ecosystem Lubuk Damar (based on isotope δ13C and δ15N approach)		
6.	Nanoparticle of Egg Yolk in Frozen Semen Diluent to Support Germ Plasm Conservation of Garut Sheep	Oriza Savitri Ariantie	a. To produce egg yolk freeze dry product through freeze drying process b. To minimize the size of the egg yolk through the nano-milling process c. To prove the potential of egg yolk freeze dry and egg yolk nanoparticles in tris diluents to maintain the quality of sperm resulting from storage of sperm	Scientific community, government institutions, private enterprise and local community	a. To obtain egg yolk freeze dry and egg yolk nanoparticles as semen diluent to maintain the quality of freezing sperm b. To provide information on the effect of egg yolk freeze dry and egg yolk nanoparticles on the frozen storage of sperm c. To provide recommendations on nanometer-sized diluents made in the country that can be used for the conservation of native germ plasm of Indonesia	GOI- DIPA	-

C. On – Going Research Project from School Garden Teacher							
1.	"Landscaping" as Project Based Learning: Creating an Artistic School Garden as Contextual and Integrated Learning Media in SMPN 13 Kota Sukabumi	Savitri Mutia Agustine, S.Pd.	a. To create an artistic school garden that will support the mandate of the school as a school built by art b. To familiarize students and the whole school community to love the environment and can garden or cultivate c. To create school gardens to be a source of learning and display space for the creation of learners d. To train students to have patience, independence, hard work and able to work together in teams	Scientific community, government, local community	a. To construct the creation of an artistic school garden and synergize with the mandate of the school as a leading school of arts b. To construct the creation of an Open Space Green to be utilized in all the moments that exist in school c. To make the school garden as one of the habituation program in school in the field of environment and health d. To form learners into a positive and character person	GOI- DIPA	-
2.	Improving Cooperation and Nutrition Among Special Need Students at School of Human Bekasi Through Vertical and Raised Bed Organic Gardening Within the Teamwork Method of Learning	Tri Mariyanti S.Pd.	a. To determine the early ability of special needs student in learning raised bed organic gardening model at School of Human Bekasi b. To apply the team work method in learning about vertical and raised bed organic gardening models and improving cooperation and nutrition of special need students at School of Human Bekasi	Scientific community, government, local community	a. To enhance cooperation among them and improve their nutrition b. To create guidelines for teachers in teaching children, especially special needs student about certain skills like gardening c. For schools, to serve an input to improve policies and programs related to the learning process of	GOI- DIPA	-

			c. To assess the improvements in the learning process capability of special needs students about vertical and raised bed organic gardening models after using team work method at School of Human Bekasi d. To find out the benefits of team work method in enhancing nutrition of special need students at School of Human Bekasi through engaging them in vertical and raised bed organic gardening activities		students in order to improve the quality of education		
D. On-Going YEO Grant Project							
1.	Water Quality Assessment for Aquaculture and Chemical Content of Mangrove – Based Food	Aditya Sukma Bahari, S.Kel.	a. To identify water quality for aquaculture purposes as a resilience activities in flooding area b. To know the best fish species for aquaculture activities c. To determined chemical content of mangrove – based food d. To collect base line data for further Sister School programs	Scientific community, government, local community	a. To give information to change the flooded area to be productive fishpond b. To create baseline data in school development c. For chemical content in mangrove based food, research results can be used to help the coastal community to increase the quality of mangrove snack and chips in Bedono village	GOI- DIPA	-
E. Completed National Research Project from In-House Researchers and Partner Agencies 2017							
1.	Postharvest Quality Improvement of Arabica Coffee Beans (*Coffea arabica*) Stored	Prof. Dr. Okky Setyawati Dharmaputra	a. To investigate the effect of processing methods and type of packaging materials during storage on the quality of Arabica	Scientific community, government institutions, private	a. To get recommendation on the best method of processing and storing of Arabica coffee beans to	GOI- DIPA	-

	Under Warehouse Conditions		coffee beans in terms of fungal infection (especially OTA producing fungi) and OTA contamination. Moisture content and the physical quality of the beans will also be analyzed, because they affect fungal infection and OTA contamination b. To recommend appropriate processing method and the type of packaging materials to ensure the quality of Arabica coffee beans during storage	enterprise and local community	stakeholder at each level of distribution chain. b. To get information on the effect of processing methods and type of packaging materials during storage on the quality of Arabica coffee beans in terms of fungal infection (especially OTA producing fungi) and OTA contamination		
2.	Biological Control of *Acacia nilotica* Subsp. *indica* by Using Bio Agent *Chiasmia assimilis* (Warren)	Dr. Soekisman Tjitrosemito, M.Sc.	To control *Acacia nilotica* Subsp. *indica* by Using Bio Agent *Chiasmia assimilis*	Scientific community, government institutions, private enterprise and local community	To get recommendation and information about controlling of *A. nilotica* subsp. indica using biological agent insects *Chiasmia assimilis* in Indonesia	GOI- DIPA	-
3.	Study on Sengon (*Falcataria moluccana)* Resistance to Boktor Pest (*Xystrocera festiva*) and Gall Rust (*Uromycladium tepperianum*) Part II	Dr. Ir. Ulfah J. Siregar, M.Agr.	a. To optimize the construction of genomic library library of sengon as materials to obtain full length sequence of resistance genes against pests and diseases b. To optimize the construction of cDNA library for identification of expressed resistance genes by PCR and sequencing c. To develop of new marker, e.g. SNiP, from sequence analysis	Scientific community, government institutions, private enterprise and local community	a. To create clones of cDNA and genomic library as material for further investigation of genes encoding resistant to boktor pest and gall rust fungi b. To sequence of genes encoding resistance to boktor pest as well as gall rust diseases	GOI- DIPA	-

					c. To create newmarker for sengon tree improvement and breeding d. To create Publications in an international journal		
4.	Development of Fumigant Tablet and Gel Essential Oil-Based Formulation for Controlling Phosphine Resistant Strain of Stored-Product Insect Pests	Dr. Idham Sakti Harahap	a. To collect stored-product insect samples that suspected resistant to phosphine from food and feed storages in Bali, South Sulawesi and West Nusa Tenggaraprovinces to complete our database of phosphine resistant strains that we developed since 2011 b. To fractionate and test the effectiveness of essential oils from our previous studies: fennel and ginger oils against stored-product insects c. To get information about active compound of cardamom oils n-hexane fraction and cinnamon oils ethyl acetate fraction d. To develop simple fumigant formulation of clove, mint and cinnamon oil	Scientific community, government institutions, private enterprise and local community	a. To produce updated database about the spread of phosphine resistant strains of stored-product insects in Indonesia b. To produce l information about active fractions of essential oils that are expected to be more effective compared to crude oils c. To create formulation of essential oil that will be used as alternative fumigant for pantry pest management	GOI- DIPA	-
5.	Control and Eradication of *Chimonobambusa quadrangularis* in Gunung Gede Pangrango National Park	Dr. Sri S. Tjitrosoedirdjo, M.Sc.	a. To test a hypothesis that the invasion of invasive alien plant species such as *C. quadrangularis* reduces biodiversity, that may lead to altered ecosystem structure. *C. quadrangularis* being a rhizomateous plant, its structure	Scientific community, government institutions, private enterprise and local community	To give recommendation how to control and eradicate *Chimonobambusa quadrangularis* in Gunung Gede Pangrango National Park	GOI- DIPA	-

			is heavily determined by the dynamic of bud band in soils b. To estimate bud bank and where tillers are recruited, therefore, understanding the plant structure and life history of *C. quadrangularis* characterizing its pool of potential tiller recruits, including both the bud bank and supply of juvenile tillers, according to parent ramet (rhizome or tiller), to determine the relative contributions of various bud populations to tiller and rhizome recruitment, and to determine the most appropriate means of control c. To study the impact of glyphosate and imazaphir herbicides and the extract of *Mikania micrantha* on the growth of *C.quadrangularis*, in the greenhouse condition				
6.	Projections of Vulnerability Parameters in the Java Sea Using Integration of Marine Biogeochemical and Land-Use Change Models	Dr. Vincentius Siregar	a. To study the response of marine ecosystem in the Java Sea due to land use change and climate change based on IPCC's scenario using marine biogeochemical model b. To identify the sensitivity parameters (vulnerable) of the coastal and Java Sea ecosystems for policy recommendation	Scientific community, government institutions, private enterprise and local community	To generate synthesis of the model results (marine biogeochemical and spatial dynamic models) as a tool in managing the coastal and Java Sea ecosystems under environmental change period (climate and land use changes)	GOI- DIPA	-

7.	Screening of Beneficial Soil Microorganism Collected from Post Tin Mining	Dr. Dewi Wulandari	a. To select beneficial soil microorganism collected from post tin mining area based on their ability in increasing nutrient availability, solubility, in improving nutrient uptake, and increasing plant growth b. To get the best isolate of beneficial soil microorganism collected from post tin mining area		a. To produce recommendation on the potential use of beneficial soil microorganism for degraded land restoration particularly in post tin mining area b. To produce Information on the strain of beneficial soil microorganism that effective and adaptive collected from post tin mining area	GOI- DIPA	-
8.	The Effectiveness of Various Formulation of Endophytic Bacteria from Mangrove to Control *Phytophthora* Leaf Blight on Japanese Taro	Dr. Ir. Abdul Munif M.Sc.Agr.	a. To know the potential of each formulation in maintaining the viability of endophytic bacteria selected mangrove plant origin. b. To know the potential of each formulation tested in suppressing the growth of *Phytophtora colocasiae* c. To know the identity of endophytic bacteria selected mangrove plant origin that is used as an active ingredient of the formula biological control molecularly	Scientific community, government institutions, private enterprise and local community	To provide information about product formulation capabilities in maintaining the viability of endophytic bacteria selected mangrove plant origin, the data obtained product formulations ability to suppress the growth of *Phytophtora colocasiae* in greenhouses, as well as the identity data of mangrove endophytic bacteria molecularly	GOI- DIPA	-
9.	Promoting *Styrax-Coffee* Agroforestry System and Apiculture of *Trigona* sp. for White Propolis Production as	Dr. Aswandi, S.Hut, M.Si.	a. To obtain the data and information about feed resources availablity for white propolis producer *Trigona* bee on *styrax-coffee* agroforestry system	Scientific community, government institutions, private enterprise and local community	a. To produce information about sources of feed availibity for propolis producing *Trigona* bee in styrax-coffee agroforestry system	GOI- DIPA	-

Alternative Source of Livelihood for Communities in Lake Toba Catchment Area, North Sumatra	b. To formulate sustainable *styrax-coffee* agroforestry schemes that with integrated apiculture *Trigona* that optimize the land productivity, result the highest economic income and induce the soil and wáter conservation c. To identify the productivity, nutrition content and phytopharmacy of propolis *Trigona* that cultivated in styrax-coffee agroforestry system d. To calculate financial feasibility and economic value of apiculture Trigona *bee* that integrated with *styrax-coffee* agroforestry system	b. To produce the sustainable *styrax-coffee* agroforestry schemes integrated with apiculture *Trigona* that optimize the land productivity, result the highest economic income and induce the soil and water conservation c. To produce information about productivity, nutrient and phytopharmacy content of *Trigona* propolis that cultivated in *styrax-coffee* agroforestry system d. To produce the information about economic values and financial feasibility of apiculture *Trigona* bee in styrax-coffee agroforestry system e. To produce information about influence of apiculture *Trigona* bee related to the improvement of agricultural productivity and their impact on other environmental quality

10.	Succession in the Londerang Peat Forest After Fires	Ir. Bambang Hariyadi, M.Si.,Ph.D.	a. To know species richness, abundance, and distribution of plants after forest burnt, including trees, pole, sapling, and seedling b. To know comparison of flora diversity before and after fires c. To plant recruitment (seedlings) post-fire, including species diversity, the presence of native plant species, the potential spread of invasive species	Scientific community, government institutions, private enterprise and local community	a. To give information about plant specimens that had been categorized either as native, introduced, or invasive species b. To give information about species richness and abundance of both flying insect and ground insect	GOI- DIPA	-
11.	Rehabilitation of Degraded Tropical Peatland Ecosystem Through Integrated Bio-Cycle Farming System for Sustainable Land Productivity: The Role of Land Use Changes and Soil Amendment on The Characteristic of Soil Quality	Prof. Dr. Cahyono Agus DK., M.Agr.Sc.	a. To know about characteristics and quality of land use change on peatland ecosystems b. To obtain the role of agroforestry on land quality and productivity c. To obtain the role of forest fire on the land quality d. To get the technology and utilization of best organic soil amendment/organic fertilizer for sustainable productivity e. To explore some of beneficial local excellent microbes and use of biotechnology on improvement of land productivity f. To optimize site management for improvement of land productivity and dignified environment using the technology	Scientific community, government institutions, private enterprise and local community	a. To produce information about land use change and their soil characteristic in tropical peatland ecosystem b. To produce information about carbon re-sequestration and improvement of environment in degraded peatland ecosystem for mitigation of global warming c. To produce information about management of organic matter cycle in improvement of productivity and land quality that environmentally friendly and sustainable	GOI- DIPA	-

			g. To know the characteristics and contribution to the rehabilitation of degraded peatland ecosystems through integrated bio-cycle farming system for sustainable productivity and against global warming		d. To produce Information about utilization of the best bioremediation for ecosystem reestablishment in rehabilitated area degraded peatland ecosystem in South Kalimantan Indonesia. e. To produce Information about the best site management in rehabilitated area of degraded peatland ecosystem
12.	Characterization of Soil Biophysicochemical Properties and Collection of Beneficial Soil Microorganisms Potential to Restore Post-Gold Mining Area in Indonesia and Philippines	Dr. Happy Widiastuti	a. To identify indigenous and fast growing plant species that can be used to revegetate the mine spoil site b. To isolate beneficial microorganisms such as mycorrhiza, nitrogen fixing bacteria, 5 phosphorus solubilizers and others from the mine spoil environment c. To evaluate the effectiveness of beneficial microorganisms in promoting growth of test plants in the greenhouse grown in mine spoil samples d. To do biochemical characterization of the mine site and relate/access microbial diversity	Scientific community, government institutions, private enterprise and local community	a. To give information about mass produced several species and strains of beneficial microorganisms, i.e. mycorrhiza, nitrogen fixers, P. solubilizers b. To give information on how to assess biochemical properties of mine site and accessed/isolated microbial community for potential use in other agri –industrial applications

13.	Exploration of Styrax Resin Quality Based on Growth Location, Harvesting Season, and Wood Chemical Characteristics	Dr. Apri Heri Iswanto, S.Hut., M.Si.	a. To analyse of growth location effect to styrax resin quality b. To analyse of harvesting season effect to styrax resin quality c. To analyse of wood chemical compound effect to styrax resin quality	Scientific community, government institutions, private enterprise and local community	To give clarification and information of factors that determining styrax resin quality. Recently, styrax resin quality just determined with visual observation. In the end of research, there will be asolution to determine of resin quality to farmer	GOI- DIPA	-
14.	Paludiculture System Development for Restoration of Degraded Peatland: Site Characterization of Peatland and Propagation Techniques of Indigenous Plant Species	Dr. Ir. Hanna Artuti Ekamawanti, M.Si.	a. To obtain the data of biophysical and chemical characteristics in degraded peatlands in Kuala Dua village, Kubu Raya regency, West Kalimantan b. To know the appropriate propagation technique for some indigenous plant species and modules of propagation technique of each type	Scientific community, government institutions, private enterprise and local community	a. To produce information biophysical and chemical data of degraded peatland which stratified based on vegetation land cover b. To provide seedlings availability of indigenous plants and module of its propagation techniques	GOI- DIPA	-
15.	Assessment of Potentials for Payment for Mangrove Ecosystem Services in South Sulawesi Indonesia	Abdul Malik, S.T., M.Si., Ph.D.	To assess of mangrove status (extents and distribution) and associated ecosystem services (carbon sequestration, coastal protection, seawater intrusion prevention, non-timber products (fishery and fruit products), and ecotourism) to be used in formulating price in PES schemes include as reference in negotiating PES deals between buyers and sellers in payment mechanism	Scientific community, government institutions, private enterprise and local community	To provide data and information about the mangrove status (extents and distribution) and price in PES that refer to the economic values of ecosystem services in the mangrove of South Sulawesi	GOI- DIPA	-

F. Completed National Research Project from PhD Thesis Support Grantees							
1.	Phylogeography of Rhinoceros Hornbill (*Buceros rhinoceros* L, 1758) In Indonesia	Jarulis	a. To analyze the rhinoceros hornbill genetic diversity in Indonesia to evaluate the status of species using gene markers mtDNA Cytochrome b b. To explain the relationship between rhinoceros hornbill populations by its geographical distribution in Indonesia using gene markers mtDNA D-loop	Scientific community, government institutions, private enterprise and local community	To determine the origin of the population based on specific nucleotide differences in mitochondrial DNA. Cytochrome b gene that found in mitochondrial DNA can be determined from specific nucleotide differences between individuals within Rhinoceros hornbill populations	GOI- DIPA	-
2.	Study of Orangutan Behaviour to Support the Exsitu Conservation	Nurzaidah Putri Dalimunthe	To determine orangutan behavior in the zoo, to determine the effect of artificial environmental aspects (enrichment), feeding and visitor attendance towards orangutan behavior, strategized orangutan *ex situ* conservation strategy based on enclosure, food and the presence of visitors aspect in the zoo	Scientific community, government institutions, private enterprise and local community	To provide information about conservation strategies and management approaches of orangutan conservation research in the zoo. The benefits for relevant agencies is to provide recommendations regarding orangutan conservation strategy in the zoo as an evaluation of policies for zoo manager	GOI- DIPA	-
G. Completed National Research Project from YEO Grant Project							
1.	Rumah mangrove "Restoration, Nurseries and Home Education" Efforts to foster a sense of caring and love towards the mangrove area and restoration of mangrove	Kevin Alvianto	a. To raise awareness among children, youth and the local community on the relationship between environmental impact and their lifestyles towards the mangrove area b. To involve local communities to actively participate in the	Scientific community, government institutions, private enterprise and local community	a. To produce information in restoring mangrove habitat and restore the function of the mangrove on the beach early bulak b. To creatie communities play an active role in preserving and caring for	GOI- DIPA	-

	Ecosystems in the affected abrasion at bulak coastal, Jepara, Indonesia		restoration of mangrove areas and participate preserve c. To contribute to the formation of mangrove areas and reduce abrasion on the Bulak beach		the mangrove to the spirit of conservation		
H. Completed National Research Project from YEO School Teacher							
1.	The Effects of Development of Urban Agriculture Thematic Gardens to Increase Student Achievement at SMK Negeri 5 Bandung Academic Year 2016/2017	Titi Juhaeti, S.Pd.	a. To know description of urban agriculture Thematic Gardens of SMK Negeri 5 Bandung. b. To know the description of student achievement SMK Negeri 5 Bandung. c. To determine the influence of the development of Urban agriculture Thematic Gardens in SMK on student achievement	Government institutions, local community	The development of Thematic Gardens in SMK Negeri 5 generally improve the extracurriculer environment School Conserbvation Club (KKS) students' learning outcomes, both for the academic performance on cognitive and non-academic aspects in the form of self-development specially soft skills caring to the environment and the students' eco-entrepreneurship	GOI- DIPA	-
2.	The Improvement Independent in Learning of Hydroponic Gardening with Task Analysis for Children With Mentally Retarded in SLB Angkasa in Bandung District West Java	Dadang Isak, S. Pd	a. To know the ability of children with intellectual challenges early in the learning level SMALB hydroponic gardening system in SLB Angkasa Bandung regency; b. To know the technique of dividing the task (task analysis) in learning gardening hydroponic systems in SLB Angkasa Bandung; c. To know the ability of the learning process of children	Government institutions, local community	a. For student As the cornerstone to increase life skills as a standalone provision them later b. For teachers Can be used as guidelines for teachers guiding children especially children with special needs	GOI- DIPA	-

			hydroponic gardening system of mentaly retardation children in SMALB levels after using the technique of dividing the task (task analysis) in SLB Angkasa Bandung regency		c. For Schools Can be used as a new policy related to the learning process in order to improve the quality of education		
3.	Enhancing Students Literacy and Nutrition Through School Garden	Afrial, S.Pd.	a. To utilize the school park land into productive land and without leaving the aesthetic elements b. To determine the type of plants according to their chosen agricultural system c. To determine the content of nutrients contained in plant species that they grow d. To make a business analysis of the plants that they develop e. To cultivate the crops that they grow into healthy foods for nutrition and nutritional intake of the body	Government institutions, local community	a. To give information of the content nutrients n plant species that they grow b. Make a business analysis of the plants that they develop c. To give information how to produce crops that they grow into healthy foods for nutrition and nutritional intake of the body. Sale the products to market	GOI- DIPA	-
4.	Indraloka School Garden as a Means of Quality Improvement Nutrition and Quality of Students in SMA Negeri Taruna Nala Jawa Timur	Dra. Emmy Yuliastuti	a. To know the nutrient content of vegetables to prevent sleepy know and apply b. To apply on patterns of food for breakfast, lunch, and dinner	Government institutions, local community	To give information about cultivation of vegetables in school and introducing new types of vegetables, raise the interest of students to consume vegetables, and reduce spending to buy nutritious food	GOI- DIPA	-
5.	School based Mushroom Processing for Socio-Preneurship and Income Improvement of	Rina Finanti, S.Ab.	a. To improve the students competence in sale and marketing b. To improve entrepreneurship spirit of the students and	Government institutions, local community	a. To be a producer and supplier of mushroom meatball in Bogor b. To be a training center of oyster mushroom based	GOI- DIPA	-

Students And Community	surrounding community. c. To increase the products of oyster mushroom d. To increase income of the students and surrounding community	snacks c. The existence of production house of mushroom meatball

Appendix 2. SEAMEO BIOTROP List of Training and Other Learning Activities FY 2017/2018

No	Activities	Objectives	Date and Venue	Source of Fund	Types and number of participants			Collaborating Agency	Participant's Country
					Remarks				
					F	M	Total		
A. National Training Courses, Workshops, Group Discussions, Seminars and Meetings									
1	National Training on School Garden for Student Literacy and Nutritional Improvement	In general, objectives of this training is to offer knowledge and understanding to participants in the importance of School Garden program. The expected outputs of this training is the participants are ready to commit in implementing the knowledge in their respective schools or community.	SEAMEO BIOTROP, 10 – 14 July 2017	GoI-DIPA	25	13	38		All Indonesian
2	Focus Group Discussion on the Utilization of The Next-Generation Sequencing (NGS) on the Characterization Process of Genetically Modified Products (GEPs)	To provide information regarding NGS technique on the characterization process of Genetically Modified Products	Bogor, 11 July 2017	PT. Branita Sandhini	3	4	7		All Indonesian
3	Training on Basic Entrepreneurship for SEAMEO STAR Village Farmers and Housewives	In general, the training aims to enhance the knowledge and skills of farmers and housewives that have been previously trained by SEAMEO BIOTROP and selected out-of-school/unemployed youth of Cihideung Ilir on the basics of entrepreneurship and product marketing with the intention of making all of them work effectively and efficiently together to develop integrated small-scale enterprises in their village.	SEAMEO BIOTROP, 11 – 13 July 2017	GoI-DIPA	15	4	19		All Indonesian

	Meeting Roadmap For The Development and Application of Genetically Engineered Products In Indonesia (Sixth Coordination Meeting)	To gather the information and suggestions from other stakeholders regarding the roadmap draft	Bogor, 8 August 2017					Coordinating Ministry of Economy Affairs	
4	National Training on Applications of Acoustic Technology for Marine Biota Inventory and Conservation	The main objectives of the course is to provide theoretical and practical knowledge and skills to the participants on the use and operation of marine acoustics instruments for the collection and analysis of fish, zooplankton, coral reef, seagrass, seabed data, and to some extent for mapping archaeological resources.	SEAMEO BIOTROP, 21-25 August 2017	GoI-DIPA	7	21	28		All Indonesian
5	National Training on Prevention and Control of Mycotoxin in Food and Feedstuff	General purpose of this training is to provide knowledge and skills needed in preventing and managing Mycotoxin in food supplies, such as corn, peanuts, nutmeg, flour and feed. In addition, participants will be given information about methods in fungus identification and Mycotoxin assessment.	SEAMEO BIOTROP, 22-25 August 2017	GoI-DIPA	21	5	26		All Indonesian
6	National Seminar-Workshop on Mainstreaming Invasive Alien Species Control and Management in the Agriculture University Curriculum in Indonesia	The seminar-workshop aims to generate national consesus and commitment in mainstreaming IAS management as a subject matter for teaching and research in the curricular program of relevant faculties in leading universities in Indonesia.	SEAMEO BIOTROP, 29- 31 August 2017	GoI-DIPA, SEDF	6	6	12		All Indonesian
7	Focus Group Discussion on the Roadmap (1st FGD)	To gather the information and suggestions from other stakeholders in order to finalize the roadmap draft	Malang, 6 September 2017		16	20	36	Coordinating Ministry of Economy Affairs	
8	Focus Group Discussion with Communities and Stakeholders from 5 villages around SEAMEO BIOTROP	The objective of this FGD is to gain inputs from stakeholders, government, private and individual in order to develop joint program that serves as SEAMEO BIOTROP's participation in promoting communities around SEAMEO BIOTROP's office and to continue BIOTROP's programs that have and/or being conducted.	SEAMEO BIOTROP, 7 September 2017	GOI – DIPA	8	16	24		All Indonesian

9	Talkshow on Global Impact of Biotech Crops	To provide information on the economic and environmental effects of biotech crops from 1996 to 2015 to media practitioners	Jakarta, 11 September 2017	Croplife Indonesia	9	17	26	Coordinating Ministry of Economic Affairs, Croplife Indonesia	
10	National Training on Spatial Dynamic Modeling for Agricultural Production Planning	This training's objective is to improve participant's knowledge and understanding in the importance of spatial data in planning, management, and utilization of agriculture area. Furthermore, the participants will be given information in arranging and using spatial models to predict food (rice) supplies sufficiency in various administration and demography level	SEAMEO BIOTROP, 11-15 September 2017	GoI-DIPA	11	21	32		All Indonesian
11	Tropical Plant Identification Workshop	This workshop is intended as learning facility for participants in identifying plants, either using identification keys or using herbarium specimens	SEAMEO BIOTROP, 11-15 September 2017	GOI-DIPA	7	15	22	CRC Efforts	All Indonesian
12	Seminar on Global Impact of Biotech Crops	To provide information on the economic and environmental effects of biotech crops from 1996 to 2015 to biotech stakeholders	Jakarta, 12 September 2017	Croplife Indonesia	18	23	41	Coordinating Ministry of Economic Affairs, CropLIfe Indonesia	
13	National Training on Improving Aquaponic Production System through Biofloc Technology Application	In general, the training aims to provide a working knowledge and appropriate skills to the participants in implementing an aquaponics-biofloc production system in their respective job stations and communities.	SEAMEO BIOTROP, 25-29 September 2017	GoI-DIPA	12	20	32		All Indonesian
14	2nd Focus Group Discussion on Roadmap on Biotech	To gather the information and suggestions from other stakeholders in order to finalize the roadmap draft	Jakarta, 3 October 2017		18	32	50	Coordinating Ministry of Economic Affairs	

15	Meeting Roadmap For The Development and Application of Genetically Engineered Products In Indonesia (Seventh Coordination Meeting)	To discussed the result of FGD to finalize the roadmap	Bogor, 13 November 2017		9	11	20	Coordinating Ministry of Economic Affairs	
16	Fourth Quarterly Public Seminar: Genetic Strategic for Yield Improvement in Major Crops	To enhance the knowledge of participants about genetic Strategic for Yield Improvement in Major Crops	SEAMEO BIOTROP, 14 December 2017	SEDF	20	13	33		All Indonesian
17	Meeting Roadmap For The Development and Application of Genetically Engineered Products In Indonesia (8th Coordination Meeting)	To discussed the result of FGD to finalize the roadmap	Bogor, 18 January 2018		3	10	13	Coordinating Ministry of Economic Affairs	
18	Seminar on Reflection and the Future of Agricultural Biotechnology in Supporting Food Sovereignty in Indonesia	To discuss the development of biotechnology in Indonesia until 2017 related to regulatory status and socio-economic benefits in particular; project the future of biotechnology products in Indonesia; and discuss the new advanced-agricultural technological developments in the world	Jakarta, 29 January 2018	Croplife Indonesia	31	40	71		
19	1st Quarterly Public Seminar : "Ecology and Conservation of *Nepenthes* Pitcher Plant"	To enhance the knowledge of participants about Ecology and Conservation of *Nepenthes* Pitcher Plant	SEAMEO BIOTROP, 17 February 2018	GoI-DIPA	27	18	45		All Indonesian
20	Talkshow: Forging Ahead with Tropical Biology for Environmental and Societal Transformations in Southeast Asia (Tropical BEST-SEA)	This seminar objective is to disseminate information of research outputs, products, and various SEAMEO BIOTROP's programs as BIOTROP's contribution for society.	SEAMEO BIOTROP, 26-28 February 2018	GoI-DIPA			414		All Indonesian
21	Meeting Roadmap For The Development and Application of Genetically Engineered Products In Indonesia (9th Coordination Meeting)	To discussed the result of FGD to finalize the roadmap	Semarang, 1 March 2018		4	8	12	Coordinating Ministry of Economic Affairs	

22	Meeting Roadmap For The Development and Application of Genetically Engineered Products In Indonesia (10th Coordination Meeting)	To discussed the result of FGD to finalize the roadmap	Bogor, 19 March 2018		5	8	13	Coordinating Ministry of Economic Affairs	
	Meeting Roadmap For The Development and Application of Genetically Engineered Products In Indonesia (11st Coordination Meeting)	To discussed the result of FGD to finalize the roadmap	Jakarta, 23 April 2018		13	22	35	Coordinating Ministry of Economic Affairs	
23	Training on the Management of Weeds and Invasive Alien Plant Species	This training purpose is to provide knowledge and skills in management of weeds and invasive alien plant species, as well as to strengthen networks between participants in order to disseminate information on management of weeds and invasive alien plant species.	Universitas Jambi, 23-27 April 2018	GoI-DIPA	10	11	21	Universitas Jambi	All Indonesian
24	2nd Quarterly Public Seminar: "Nanotechnology Research in Indonesia: Status, Prospects and Challenges"	To enhance the knowledge of participants about Status, Prospects and Challenges Nanotechnology Research in Indonesia	SEAMEO BIOTROP, 29 June 2018	GoI-DIPA	23	18	41		All Indonesian
			B. International Conference						
25	International Seminar on Current Development on Mine Reclamation Practices and Mine Water Management	This international seminar is aimed to disseminate research results of research collaboration project, members of consortium and Universitas Sriwijaya. It is expected that the research results can be used to improve reclamation practices, to improve the management of acid water in Indonesia and the Southeast Asian region.	Palembang, 11-12 September 2017	GoI-DIPA	19	61	80	British Council	UK : 4 Indonesia: 76
			C. In-Country Training Courses, Workshops and Seminars						
26	In-country Training on Urban Agriculture for Malaysian Special Education Teachers	In general, the training course is designed to enable special education teachers acquire basic knowledge and skills on specific technologies appropriate for urban agriculture with the expectation that such technologies could be adopted in their respective	MARDI, Malaysia,	GoI-DIPA,	6	24	30	SEAMEO SEN, MARDI	All Malaysian

		schools for their students to also learn and practice for personal, family, and community development.							
		D. Fee-Based Training Courses, Workshops and Seminars							
27	Training on Geospatial Database and Management	The objectives of this training is to provide knowledge and skills in fundamental concepts of *Geographical Information System (GIS)* and practical technology for data processing for Ministry of Ocean and Fisheries personnel.	Bogor, 6-10 February 2017	Fee based	2	12	14	CTI-SEA	All Indonesian
28	Training on Cultivation of Agriculture Products	In general, this training objective is to provide competency that can help students to improve their prosperity in their respective schools (pesantren).	Bogor, 30 March - 6 April 2017	Fee based	0	19	19	HA IPB	All Indonesian
29	Advance Training on GIS and Remote Sensing	This training objectives is to train and to update participants knowledge and skills in : 1. Understanding Concepts of GIS and Remote Sensing 2. Understanding concepts on accuracy, scale, resolution and spatial data type 3. Comprehend and able to apply some methods in analysis and interpretation of satellite imagery with medium and high resolution	Bogor, 14-25 August	Fee based	0	5	5	Public Works Office Musi Rawas	All Indonesian
30	Training on Remote Sensing and GIS Application In Hazard And Risk Mapping for Watershed Management	The training program aims to increase the capabilities of staff in the application of GIS and remote sensing. Also to strengthen the capacity and capability of their institution in accordance with MAF's mandate.	Bogor, 6-17 September 2017	Fee based UNDP Project	1	5	6	Ministry of Agriculture Timor Leste	All participants Timor Leste
31	Regional Workshop on Mine Reclamation and Mine Water Management: Transformation of degraded land into productive landscape	The objectives of the workshop are: (1) to disseminate and exchange best practice of mine rehabilitation and mine water management among researchers, mining companies, and government officials in the Southeast Asian region, (2) to improve mine environmental management practices in the Southeast Asian region, and (3) to establish a network of mine environmental management in the Southeast Asian region as a platform for communication and knowledge exchange among mine environmental stakeholders.	Bogor, 21-23 November	GII Project	9	36	45	British Council	Philippines: 2 Cambodia: 2 Thailand: 1 Myanmar: 1 Indonesia: 39

32	Wood Packaging Pest Management Training through Fumigation and Heat Treatment Process	This training is intended to provide knowledge in fumigation and heat treatment process for wood packaging products as stated in ISPM#15. Through this training, participants are expected to understand the technical implementation of fumigation and heat treatment process for the compliance of ISPM No. 15, as well as to understand critical factors and prevention acts in fumigation and heat treatment process.	Medan, 16 – 17 April 2018	Fee based	4	22	26	PT. SOCI Mas	All Indonesian

Appendix 3. List of Memorandum of Understanding (MoU) / Memorandum of Agreement (MoA) Signed in FY 2017/2018

ON-GOING

No	Organization/Agency	Date Signed	Subject of Cooperation	Duration	Remarks / Implementation
1.	Government Environmental Service, Bangka Belitung Regency	3 July 2017	Cooperation for Environmental Quality Testing and Measurement	3 July 2017 – 2 July 2020 (3 Years)	On-going
2.	Government Environmental Service Bogor City	1 August 2017	Cooperation for Environmental Quality Testing and Measurement]	1 August 2017 – 31 July 2020 (3 Years)	On-going
3.	Institut Pertanian Bogor	2 August 2017	Research Cooperation: CRC990 / EFFORTS "Ecological and Socio-economic Functions of Tropical Lowland Rainforest Transformation Systems in Sumatra, Indonesia"	2 August 2017 – 31 December 2020 (30 Months / 2.5 Years)	On-going
4.	Universitas Brawijaya	16 August 2017	1. Provision of technical advice in research and development on tropical biology and related topics with special focus on agroforestry 2. Joint conduct of training programs and other relevant learning events on tropical biology and related topics with special focus on agroforestry 3. Exchange of information materials on tropical biology and related concerns with special focus on agroforestry 4. Scientific staff and student exchange and consultations on relevant research, training and other learning events, and 5. Other forms of cooperation whenever and wherever feasible opportunities present themselves	16 August 2017 – 15 August 2020 (3 Years)	On-going

No	Organization/Agency	Date Signed	Subject of Cooperation	Duration	Remarks / Implementation
5.	International Center for Tropical Agriculture	1 September 2017	1. Collaboration in understanding programs, projects and other related activities, whenever and wherever feasible opportunities present themselves 2. Exchange expertise, scientific materials, publications and information; 3. Execute separate agreements in writing for any particular undertaking jointly implemented, wherein a sharing of responsibilities shall be specified	1 September 2017 – 1 September 2020 (3 Years)	On-going
6.	Central Luzon State University, Philippines	20 September 2017	The areas of collaboration are: (1) Joint implementation of research activities on tropical biology and related concerns in a manner that will be mutually agreed between the Parties with special focus on the conservation and sustainable use of mangrove ecosystem; (2) Provision of technical advice in research and development on tropical biology and related topics; (3) Joint conduct of training programs and other relevant learning events on tropical biology and related topics; (4) Exchange of information materials on tropical biology and related concerns; (5) Scientific staff and student exchange and consultations on relevant research, training, and other learning events;	20 September 2017 – 19 September 2020 (3 Years)	On-Going

No	Organization/Agency	Date Signed	Subject of Cooperation	Duration	Remarks / Implementation
			and (6) Other forms of cooperation whenever and wherever feasible opportunities present themselves		
7.	Government Environmental Service, Belitung Regency	16 October 2017	Cooperation for Environmental Quality Testing and Measurement	16 October 2017 – 15 October 2020 (3 Years)	On-Going
8.	Cagayan State University, Philippines	18 October 2017	The areas of collaboration are: (1) Joint implementation of research activities on tropical biology and related topics in a manner that will be mutually agreed between the Parties; (2) Provision of technical advice in research and development on tropical biology and related topics; (3) Joint conduct of training programs and other relevant learning events on tropical biology and related topics; (4) Exchange of information materials on tropical biology and related topics; (5) Scientific staff and student exchange and consultations on relevant research, training, and other learning events; and (6) Other forms of cooperation whenever and wherever feasible opportunities present themselves.	18 October 2017 – 17 October 2020 (3 Years)	On-Going
9.	Vietnam National University of Agriculture, Vietnam	18 October 2017	The areas of collaboration are: (1) Joint implementation of	18 October 2017 – 17 October 2020	On-Going

No	Organization/Agency	Date Signed	Subject of Cooperation	Duration	Remarks / Implementation
			research activities on tropical biology and related topics in a manner that will be mutually agreed between the Parties; (2) Provision of technical advice in research and development on tropical biology and related topics; (3) Joint conduct of training programs and other relevant learning events on tropical biology and related topics; (4) Exchange of information materials on tropical biology and related topics; (5) Scientific staff and student exchange and consultations on relevant research, training, and other learning events; and (6) Other forms of cooperation whenever and wherever feasible opportunities present themselves.	(3 Years)	
10.	Provincial Government of East Kalimantan	24 October 2017	Collaboration in the Development and Transfer of Former Mining Land Reclamation Technology in East Kalimantan Province	24 October 2017 – 23 October 2018 (1 Year)	On-Going
11.	PT INAGRO	27 October 2017	Cooperation in utilizing the results of research and development in agricultural science and technology as well as facilities and resources owned by both parties	27 October 2017 – 26 October 2020 (3 Years)	On-going
12.	Royal University of Agriculture	6 November 2017	The areas of collaboration are: (1) Joint implementation of research activities on tropical biology and related topics in a	6 November 2017 – 5 November 2020 (3 Years)	On-going

No	Organization/Agency	Date Signed	Subject of Cooperation	Duration	Remarks / Implementation
			manner that will be mutually agreed between the Parties with special focus on animal production, agribusiness, biodiversity and rural development; (2) Provision of technical advice in research and development on tropical biology and related topics with special focus on animal production, agribusiness, biodiversity and rural development; (3) Joint conduct of training programs and other relevant learning events on tropical biology and related topics with special focus on animal production, agribusiness, biodiversity and rural development; (4) Exchange of information materials on tropical biology and related concerns; (5) Scientific staff and student exchange and consultations on relevant research, training, and other learning events; and (6) Other forms of cooperation whenever and wherever feasible opportunities present themselves.		
13.	Universitas Jenderal Soedirman	17 November 2017	The areas of collaboration are: (1) Joint implementation of research activities on tropical biology and related topics in a manner that will be mutually agreed between	17 November 2017 – 16 November 2022 (5 Years)	On-going

No	Organization/Agency	Date Signed	Subject of Cooperation	Duration	Remarks / Implementation
			the Parties; (2) Provision of technical advice in research and development on tropical biology and related topics; (3) Joint conduct of training programs and other relevant learning events on tropical biology and related topics; (4) Exchange of information materials on tropical biology and related concerns; (5) Scientific staff and student exchange and consultations on relevant research, training, and other learning events; and (6) Other forms of cooperation whenever and wherever feasible opportunities present themselves.		
14.	Royal University of Phnom Penh	27 November 2017	The areas of collaboration are: (1) Joint implementation of research activities on tropical biology and related topic, with special focus on Biodiversity management and sustainable entrepreneurship, in a manner that will be mutually agreed between the Parties; (2) Provision of technical advice in research and development on tropical biology and related topics with special focus on biodiversity and sustainable entrepreneurship; (2) Joint conduct of training programs and other	27 November 2017 – 26 November 2020 (3 Years)	

No	Organization/Agency	Date Signed	Subject of Cooperation	Duration	Remarks / Implementation
			relevant learning events on tropical biology and related topics with special focus on biodiversity and sustainable entrepreneurship; (3) Exchange of information materials on tropical biology and related concerns with special focus on with special focus on biodiversity and sustainable entrepreneurship; and (4) Scientific staff and student exchange and consultations on relevant research, training, and other learning events		
15.	Government Environmental Service, Bangka Tengah Regency	4 December 2017	Cooperation for Environmental Quality Testing and Measurement	5 December 2017 – 5 December 2020 (3 Years)	On-going
16.	Indonesian Biotechnology and Bioindustry Research Center	2 January 2018	Semi-field testing of the efficacy of natural fungicides: Greemi-G P" in oil palm nurseries	2 January – 31 July 2018 (7 Months)	On-going
17.	Government of Bogor City	12 February 2018	Social Economic Development to support the Bogor City Program as a Green City	12 February 2018 – 11 February 2019 (1 Year)	On-going
18.	Indonesian Remote Sensing Society (MAPIN)	26 February 2018	Collaboration in the fields of education, research, training and community service in the field of Geospatial]	26 February 2018 – 25 February 2021 (3 Years)	On-going
19.	Pangkajene and Kepulauan State Polytechnic of Agriculture	26 February 2018	Development of human resources in the field of research and development of agricultural, fishery and livestock commodities based on appropriate technology	26 February 2018 – 25 February 2021 (3 Years)	On-going
20.	Government of Fakfak Regency, Papua Province	26 February 2018	Human Resource Development	26 February 2018 – 25 February 2019 (1 Year)	On-going

No	Organization/Agency	Date Signed	Subject of Cooperation	Duration	Remarks / Implementation
21.	PT Garudafood Putra Putri Jaya	26 February 2018	Fostering human resources through Training and Research activities in the field of Integrated Storage Pest Management in Food Industry, Services and other activities	26 February 2018 – 25 February 2021 (3 Years)	On-going
22.	Universitas Gunadarma	26 February 2018	Research and Development of Urban Agriculture and Application of Information Technology in Agriculture	26 February 2018 – 25 February 2023 (5 Years)	On-going

COMPLETED

No	Organization/Agency	Date signed	Subject of Cooperation	Duration	Remarks
23.	UNDP Timor Leste	27 October 2017	To Conduct GIS Training for DARDC Project Counterpart	27 October– 26 November 2017 (1 Month)	Completed
24.	PT J Resources Bolaang Mongondow (Addendum)	7 August 2017	Addendum No. 001 of Consultant Agreement for Sampling and Analyzing Soil Quality	7 August - 1 Nopember 2017 (16 Weeks / 4 Months)	Completed
25.	PT Bukit Asam, Tbk. (Addendum)	30 July 2017	Employment of Reclamation Consultation Services and Assistance for Utilizing Post-Mining Land (SPPH-2257)	1 Feb 2015-31 Jan 2018 (3 Years)	2018 / Completed Addendum

Appendix 4. List of Post and Undergraduate Students Who Conducted Researches, Internships and On-The-Job Trainings at SEAMEO BIOTROP during FY 2017/2018

A. Research

No.	Name	Institution and Level	Research Title	Unit Affiliated With	Supervisor
1.	Berlinda Utami Putri	Univ. Diponegoro Fak. Peternakan and Pertanian (S1)	Soybean (*Glycine max*) Production and Straw Nutrition with Various Fertilization and Inoculation of Arbuscular Mycorrhizal Fungi	Mycorrhiza Laboratory	Dr. Dewi Wulandari
2.	Artha Rizki Anggarani	Univ. Diponegoro Fak. Peternakan and Pertanian (S1)	Soybean Production and Nutrition with Double Inoculation (Arbuscular Mycorrhiza + *B. Japonicum*) and Phosphate Fertilization	Mycorrhiza Laboratory	Dr. Dewi Wulandari
3.	Ihsan Nugraha	IPB Fak. Perikanan and Ilmu Kelautan (S1)	Analysis of the Distribution of Suspended Solids by Using Multitemporal Satellite Imagery in Semarang Waters	Remote Sensing Laboratory	Dr. Vincentius P. Siregar
4.	Waheed Ul Hasan	IPB Fakultas Pertanian S2	Toxicity, Repellency and Physiological Inhibition Effects of Different Essential Oils against Storage Pest *Callosobruchus maculatus* (Bruchidae: Coleptera)	Entomology Laboratory	Dr. Idham Sakti Harahap
5.	Diajeng Shintohapsari	IPB Fakultas Pertanian S2	Effectiveness of Cinnamon and Nutmeg Essential Oil as a Fumigant to *Oryzaephilus surinamensis*	Entomology Laboratory	Dr. Idham Sakti Harahap
6.	Hariadi Propantoko	IPB Fahutan S2		Silviculture Laboratory	Dr. Irdika Mansur
7.	Nia Novita Sari	IPB Fakultas Pertanian S2	Resistance Testing of *Oryzaephilus surinamensis* against Phosphine and the Relative Diversity of Strains	Entomology Laboratory	Dr. Idham Sakti Harahap
8.	Jeffrey fransiscus	IPB FMIPA Dept Biologi (S1)	Effectiveness of Calcium Chloride and Chitosan for the Control of *Thielaviopsis paradoxa*, Fungi causing Rotten Fruit on Salak Pondoh	Phytopathology Laboratory	Prof. Dr. Okky S. Dharmaputra
9.	Diana Budiman	IPB Fakultas Pertanian S2	Submission of *T. castaneum* and *L. serrierne* Response to Combination Plug Trap with UV LEDs on Copra Oilcake	Entomology Laboratory	Dr. Idham Sakti Harahap
10.	Alfath Fanidya	Univ. Negeri Semarang S1	Nanoparticle Technology of Dimethyloctane Dioic Acid Compound as an Active Ingredient in Warehouse Pest Control System *Callosobruchus maculatus*for National Food Safety	Entomology Laboratory	Dr. Idham Sakti Harahap

11.	Yuliawati	IPB Fak. Pertanian S2	Evaluation of Pure Strain Selection Results of Bogor Bean	Experimental Garden	
12.	Revi Juniar S	IPB Fahutan S1	Expression of Action Genes on Sengon Plants	Biotechnology Laboratory	Dr. Ir. Ulfah Juniarti Siregar
13.	Siti Azizah Yahya	IPB Fahutan S1	Expression of Amilase Genes on Sengon Plants	Biotechnology Laboratory	Dr. Ir. Ulfah Juniarti Siregar
14.	Muhammad Majiidu	IPB Fahutan S1	Gaharu-Forming Gene Expression	Biotechnology Laboratory	Dr. Ir. Ulfah Juniarti Siregar
15.	Fitria Zahra Oktavia	IPB FMIPA Dept Biokimia		Biotechnology Laboratory	Dr. Ir. Ulfah Juniarti Siregar
16.	Fageta Dwi Safitri	Univ. Diponegoro Fateta (S1)	Absorption of Lead (Pb) in Rooting System of Marigold Plants (*Tagetes erecta* L.) Inoculated with Several Species of Arbuscular Mycorrhizal Fungi (CMA)	Silviculture/Mycorrhiza Laboratory	Dr. Irdika Mansur
17.	Amalia Ramadhina Ghaisani	Univ. Diponegoro Fateta (S1)	Growth and Production of Chili (*Capsicum frutescens* L.) with Phosphate Fertilization and Inoculation of Arbuscular Mycorrhizal Fungi	Silviculture/Mycorrhiza Laboratory	Dr. Irdika Mansur
18.	Siti Aida Insani	Univ. Djuanda Faperta (S1)	Repellent Power Test of Fragrance Leaf Extract (*Panandus amaryllifolius*) with Ethanol and N-Hexane Solvents against Warehouse Pests *Sitophilus zeamais*	Entomology Laboratory	Dr. Idham Sakti Harahap
19.	Alfia Wulansari	Univ. Djuanda Faperta (S1)	Insecticidal and Repellent Power of Citrus Leaf Extract (*Citrus hystrix* D.C) on the Warehouse Pest of *Sitophilus zeamais* (Motschulsky)	Entomology Laboratory	Dr. Idham Sakti Harahap
20.	Rizka Saputri	Univ. Negeri Semarang FMIPA (S1)	Activity of 4.8 Dimethyldecanal Compound as an Active Ingredient to Control Tapworm (*Tribolium castaeneum*) for National Food Security	Entomology Laboratory	Dr. Idham Sakti Harahap
21.	Mohamad Faiz	Surya University (S1)	Mapping Environmental Conditions in Situ Ciledug using Drones	Remote Sensing Laboratory	Slamet Widodo, S.Si.
22.	Priyo Sadewo	IPB Fahutan (S1)	Agroforestry of Teak (*Tectona grandis* Linn) with Lemongrass (*Cymbopogon nardus* L) Resulted from Irradiation of Gamma Rays	Natural Product Laboratory	Dr. Supriyanto

B. Internship and On-the-Job Training

No.	Name	Institution and Level	Activity	Unit Affiliated With	Supervisor
1.	Fransiska Adeline	i3L (S1)	Isolation of Potassium Solubilizing Microbes from Coal Mining Soil	Mycorrhiza Laboratory	Dr. Dewi Wulandari
2.	Ade Nurhidayati	SMK Terpadu Al-Ittihad	Water Quality Testing	Water and Air Laboratory	Budi Cahyadi, S.Si.
3.	Sri Nurdenti	SMK Terpadu Al-Ittihad	Determination of pH value, CEC and Al-Hdd	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
4.	Epin Pinasti	UIN Bandung (S1)	Plant Cultivation using Tissue Culture	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
5.	Aulia Adilah J	UIN Bandung (S1)	Plant Cultivation using Tissue Culture	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
6.	Anarita Diana	UIN Bandung (S1)	Plant Cultivation using Tissue Culture	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
7.	Elisa Martiana	UIN Bandung (S1)	Plant Cultivation using Tissue Culture	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
8.	Dina Nurmardiana	UIN Bandung (S1)	Plant Cultivation using Tissue Culture	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
9.	Fhatimah Az Zahra	SMK AK Nusa Bangsa	Determination of CN ratio and PH Value	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
10.	Mifthahull Jannah	SMK AK Nusa Bangsa	Determination of Cu and Zn Levels on Soil from Three Different Locations and Depths	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
11.	Yohana Setiawan	UKI Atmajaya (S1)	Micropropagation of Banana Seedlings (*Musa paradisiaca* L.) using Tissue Culture Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
12.	Joshua Adyatama	UKI Atmajaya (S1)	Micropropagation of Japan Taro Plants using Tissue Culture Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
13.	Andung W	IPB FMIPA Biokimia (S1)		Natural Product Laboratory	Jonner Situmorang, M.Si.
14.	Yedida	ITB Rekayasa Pertanian (S1)	Influence of Fertigation Duration on the Production of Green Kale and Green Basil Plants in Hydroponics Lab	Hydroponics	Riana Hartati, S.Si.
15.	Ashila Azmi F	ITB Rekayasa Pertanian (S1)	Comparative Effects of Cardamom and Citronella Essential Oil Extracts to Imago of *Crytrolestes* sp. with *Tribolium castaneum*	Entomology Laboratory	Sri Widayanti, M.Si.
16.	Ira Indira Putri	ITB Rekayasa Pertanian (S1)	Influence of Growing Media of Ab Mix Nutritional Solution from Hydroponics to the Growth of White Oyster Mushroom	Mushroom Laboratory	Sugih Mukti

17.	Nur Azizah Khoerunnisa	IPB FMIPA Dept Kimia (S1)	Verification of Test Method of Nitrogen Dioxide (NO_2) Air Ambient by Griess Saltzman Method using Spectrophotometer	Water and Air Laboratory	Budi Cahyadi, S.Si.
18.	Riadi	IPB FMIPA Dept Kimia (S1)	Verification of Test Method of Nitrogen Dioxide (NO_2) Air Ambient by Griess Saltzman Method using Spectrophotometer	Water and Air Laboratory	Budi Cahyadi, S.Si.
19.	Sri Hartati	IPB FMIPA Dept Kimia (S1)	Determination of Fertility of Oil Palm Plantations at Three Sites and Six Different Depths	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
20.	Sekar Ilma Tiarani	IPB FMIPA Dept Kimia (S1)	Determination of Aflatoxin Levels in Beans and Maize using HPLC Method	Food and Feed Laboratory	Ratnaningsih, S.Si.
21.	Yudi Maulana	Univ Djuanda Fak Pertanian (S1)	Edible Mushroom Cultivation Technique	Mushroom Laboratory	Sugih Mukti
22.	Muh Hifny Aziziy	Univ Djuanda Fak Pertanian (S1)	Edible Mushroom Cultivation Technique	Mushroom Laboratory	Sugih Mukti
23.	Alfi Sumantri	Univ Djuanda Fak Pertanian (S1)	Edible Mushroom Cultivation Technique	Mushroom Laboratory	Sugih Mukti
24.	Ilham Hermawan	Univ Djuanda Fak Pertanian (S1)	Edible Mushroom Cultivation Technique	Mushroom Laboratory	Sugih Mukti
25.	Otang Alfarizi	Univ Djuanda Fak Pertanian (S1)	Edible Mushroom Cultivation Technique	Mushroom Laboratory	Sugih Mukti
26.	Desi Putri Pertiwi	IPB FMIPA Dept Ilkom (S1)	Database Development	KMD	Harry Imantho, M.Sc.
27.	Nur Radiatun	IPB FMIPA Dept Ilkom (S1)	Database Development	KMD	Harry Imantho, M.Sc.
28.	Ayub Eko Prasetyo	IPB FMIPA Dept Ilkom(S1)	Database Development	KMD	Harry Imantho, M.Sc.
29.	Emiel Nur kautsar	IPB FMIPA Dept Ilkom (S1)	Database Development	KMD	Harry Imantho, M.Sc.
30.	Siti Syarah Annisa	IPB FMIPA Dept Ilkom (S1)	Database Development	KMD	Harry Imantho, M.Sc.
31.	Sita Nabila Kamelia	IPB FMIPA Dept Ilkom (S1)	Database Development	KMD	Harry Imantho, M.Sc.
32.	Agung Setia Ningsih	Univ. Lampung FMIPA (S1)	Total Coliform Test on Domestic Wastewater and Faecal Coliform Test on River Water	Water and Air Laboratory	Budi Cahyadi, S.Si.
33.	Rosmaida la Sinurat	Univ. Lampung FMIPA (S1)	Determination of Physical Quality, Population of Postharvest Destroyer Fungus, and Water Content of Arabica Beans using Dry Processing Method	Phytopathology Laboratory	Ir. Ina Retnowati
34.	Diana Ismawati	Univ. Lampung FMIPA (S1)	Determination of Physical Quality, Population of Postharvest Destroyer Fungus, and Water Content of Arabica Beans using Wet Processing Method	Phytopathology Laboratory	Ir. Ina Retnowati

35.	Wis Udawati	Univ. Tanjungpura Fak Kehutanan (S1)		Natural Product Laboratory	Dr. Supriyanto
36.	Tati Lola Sari	Univ. Tanjungpura Fak Kehutanan (S1)	Isolation and Identification of Arbuscular Mycorrhizal Fungi	Silviculture/Mycorrhiza Laboratory	Dr. Dewi Wulandari
37.	Ilham Lahiya	Univ. Tanjungpura Fak Kehutanan (S1)	Characterization of Arbuscular Mycorrhizal Fungal Spores and Staining Techniques of Morphorous Root	Silviculture/Mycorrhiza Laboratory	Dr. Dewi Wulandari
38.	Ulfa Ulinnuha	Univ. Brawijaya Fak. Pertanian (S1)	Study of Warehouse Pest Management	Entomology Laboratory	Sri Widayanti, M.Si.
39.	Syikri Syahra Pahalati	Univ. Brawijaya Fak Tek Pertanian (S1)		Natural Product Laboratory	Dr. Supriyanto
40.	Ajeng Zakiah Ilmi	SMK Bina Putera Nusantara	Determination of pH and available P values by Bray Method	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
41.	Maria Siti Ulfa	SMK Bina Putera Nusantara	Testing the Quality of Wastewater	Water and Air Laboratory	Budi Cahyadi, S.Si.
42.	Ika Agustiani	IPB FMIPA (S1)		Natural Product Laboratory	Dr. Supriyanto
43.	Zulfikar Muchammad	IPB FMIPA (S1)		Natural Product Laboratory	Dr. Supriyanto
44.	Habib Hasan A	IPB FMIPA (S1)		Natural Product Laboratory	Dr. Supriyanto
45.	Alvinno Diamondi	IPB FMIPA (S1)		Natural Product Laboratory	Dr. Supriyanto
46.	Fernanda Chairunissa	IPB FMIPA (S1)		Natural Product Laboratory	Dr. Supriyanto
47.	Rendra Pranata	Universitas Padjadjaran Fak. Perikanan and Kelautan (S1)	Remote Sensing and Geographic Information System	Remote Sensing Laboratory	Dr. Vincentius
48.	Hazman Hiwari	Universitas Padjadjaran Fak. Perikanan and Kelautan (S1)	Remote Sensing and Geographic Information System	Remote Sensing Laboratory	Dr. Vincentius
49.	Abrar Farhan Sudibyo	Universitas Padjadjaran Fak. Perikanan and Kelautan (S1)	Remote Sensing and Geographic Information System	Remote Sensing Laboratory	Dr. Vincentius
50.	Muhammad Fakhrurrozi	Universitas Padjadjaran Fak. Perikanan and Kelautan (S1)	Remote Sensing and Geographic Information System	Remote Sensing Laboratory	Dr. Vincentius
51.	Citra Afriliani	SMKN 1 Kuala Kampar	Computer Network System	KMD	Harry Imantho, M.Sc.
52.	Rafdita Purba Nuraini	Universitas Lambung Mangkurat (S1)	Cultivation of Plants using Hydroponics Techniques	Hydroponics	Riana Hartati, S.Si.

53.	Lutvi Abdullah	IPB Analis Kimia D3		Natural Product Laboratory	Jonner Situmorang, M.Si.
54.	Lutfiani Maulidya	IPB FMIPA (S1)	Vegetable Cultivation by Hydroponics with NFT System	Hydroponics	Riana Hartati, S.Si.
55.	Bimo Muhammad R	Univ. Pakuan FMIPA (S1)	Database Development	KMD	Harry Imantho, M.Sc.
56.	Cipta Satria Ade Sanjaya	Univ. Pakuan FMIPA(S1)	Database Development	KMD	Harry Imantho, M.Sc.
57.	M. Teguh Eka Jaya	Univ. Pakuan FMIPA (S1)	Database Development	KMD	Harry Imantho, M.Sc.
58.	Siti Maryani	SMK Wikrama	Office Administration	HRMD	Suprapto
59.	Eneng Siti Khoeriah	SMK Wikrama	Office Administration	KMD	Tika Tresnawati, M.Si.
60.	Seliana Ashri	SMK Wikrama	Office Administration	GAPRD	Lidia defita
61.	Rini Saumi Desaila	SMK Wikrama	Office Administration	FAD	Ira Mutiara, SEI
62.	Winda Tribuana	SMK Wikrama	Office Administration	Procurement	Wati madyawati
63.	Ari Septyan Nurmawan	SMK Wikrama	Creation of Software System	FMD	Alfi Dwi Nugroho
64.	Kevin Matthew	SMK Wikrama	Creation of Software System	FMD	Alfi Dwi Nugroho
65.	Amalia Ramadhina Ghaisani	Univ. Diponegoro Fak. Peternakan and Pertanian (S1)	Root Inoculum Breeding Technique of Arbuscular Mycorrhizal Fungi, Its Distribution and Field Test on the Sorghum Plant	Mycorrhiza Laboratory	Dr. Dewi Wulandari
66.	Fageta Dwi Safitri	Univ. Diponegoro Fak. Peternakan and Pertanian (S1)	Inoculation Technique of Single Spore Culture Mycorrhiza on Sweet Corn Plant	Mycorrhiza Laboratory	Dr. Dewi Wulandari
67.	Kiki Nurfitriani Eka Priatna	STPP Bogor (S1)	Production of Oyster Mushroom Chips	Mushroom Laboratory	Samsul A. Yani, S.Si.
68.	Marina Hidayani	STPP Bogor (S1)	Marketing Oyster Mushroom Chips	Mushroom Laboratory	Samsul A. Yani, S.Si.
69.	Ervina lamusa, Sp., M.Si.	Dinas Pertanian Tanaman pangan dan Perkebunan Pemerintah Kab. Mimika	Tissue Culture Cultivation Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
70.	Anike Goo, Sp.	Dinas Pertanian Tanaman pangan dan Perkebunan Pemerintah Kab. Mimika	Tissue Culture Cultivation Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
71.	Benedikta Fauwawan	Dinas Pertanian Tanaman pangan dan Perkebunan Pemerintah Kab. Mimika	Tissue Culture Cultivation Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
72.	Jualily Sugestin	Dinas Pertanian Tanaman pangan dan Perkebunan Pemerintah Kab. Mimika	Tissue Culture Cultivation Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.

73.	Junita Sp	Dinas Pertanian Tanaman pangan dan Perkebunan Pemerintah Kab. Mimika	Tissue Culture Cultivation Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
74.	Helmina A	SMK N 4 Bogor	Computer Network System	KMD	Harry Imantho, M.Sc.
75.	Mira Agustina	SMK N 4 Bogor	Computer Network System	KMD	Harry Imantho, M.Sc.
76.	Herni Dwinta Pebrianti, SP, M.Si	CRC990/EFForTS		Herbarium	Dr. Sri Sudarmiyati
77.	Ghaisani Nabilah Putri	Univ. Diponegoro Fak. Peternakan and Pertanian (S1)	Tomato Cultivation (*Solanum lycopersicum*) with Drip Irrigation Hydroponics	Hydroponics	Riana Hartati, S.Si.
78.	Dina Farahdilla	Univ. Brawijaya Fak. Pertanian (S1)	Determination of Population of Post-Harvest Destructive Fungi, Physical Quality and Water Content of Arabica Coffee Beans (*Coffea arabica*) on 2 Types of Packaging	Phytopathology Laboratory	Ir. Ina Retnowati
79.	Debora Nastiti Hardianti	Univ. Brawijaya Fak. Pertanian (S1)	Study of Determination of Post-Harvest Destructive Fungus Population, Physical Quality and Water Content of Coffee Beans, (*Coffea arabica*) after Two Months of Storage at Warehouse Conservation	Phytopathology Laboratory	Ir. Ina Retnowati
80.	Ramadina Sanika Tsuzuki	Sekolah Alam Bogor	Tissue Culture Cultivation Techniques	Plant Tissue Culture Laboratory	Samsul A. Yani, S.Si.
81.	Nurpirdayani	SMKI Miftahul Huda	Office Administration	Cooperative	Riana Hartati, S.Si.
82.	Ico Yoga P	SMKI Miftahul Huda	Office Administration	PDSD	Nopi Ramli
83.	Asep Priatna	SMKI Miftahul Huda	Office Administration	PDSD	Nopi Ramli
84.	M. Rizal Fauzi	SMKI Miftahul Huda	Office Administration	Comdev	Riza Afifi
85.	Reynaldi Januar Wanter	Binus University	Waste Management	Food and Feed Laboratory	Santi Ambarwati, M.Sc.
86.	Fania Devi	SMKN 1 Kuala Kampar	Edible Mushroom Cultivation Technique	Mushroom LaboratoryandPlant Tissue Culture Laboratory	Erina Sulistiani
87.	Eviana Sukarta	SMKN 1 Kuala Kampar	Edible Mushroom Cultivation Technique	Mushroom LaboratoryandPlant Tissue Culture Laboratory	Erina Sulistiani
88.	Siti Nurhanifah	SMK YMA Megamendung	Office Administration	HRMD	Yunita, SP
89.	Dini Ramdini	SMK YMA Megamendung	Office Administration	GAD	Lidia Defita, S.Kom.
90.	Sabita Salsabila	SMK YMA Megamendung	Office Administration	CBD	Dewanti Pratiwi, S.Hut.

91.	Silvia	SMK YMA Megamendung	Office Administration	FMD	Lastiah
92.	Nadira	SMK YZA 1 Bogor	Office Administration	FAD	Supriyatno, A.Md.
93.	Nurhasanah	SMK YZA 1 Bogor	Office Administration	FAD	Supriyatno, A.Md.
94.	Tarjono	Masyarakat Kec. Mesuji	Edible Mushroom Cultivation Technique	Edible Mushroom Cultivation	Samsul A. Yani
95.	Sugeng	Masyarakat Kec. Mesuji	Edible Mushroom Cultivation Technique	Edible Mushroom Cultivation	Samsul A. Yani
96.	H. Muhtarom	Masyarakat Kec. Mesuji	Edible Mushroom Cultivation Technique	Edible Mushroom Cultivation	Samsul A. Yani
97.	Malik	Masyarakat Kec. Mesuji	Edible Mushroom Cultivation Technique	Edible Mushroom Cultivation	Samsul A. Yani
98.	Ahmad Baedhowi	Masyarakat Kec. Mesuji	Edible Mushroom Cultivation Technique	Edible Mushroom Cultivation	Samsul A. Yani
99.	Mutia Verra	Univ. Andalas Fak. Teknik Pertanian	Erosion Level Analysis in Sumani Basin of Solok District	KMD	Armaiki Yusmur, S.Si.
100.	Siska Yulianti	Univ. Andalas Fak. Teknik Pertanian	Analysis of Paddy Field Changes in Pariaman City in 2013 and 2017	KMD	Armaiki Yusmur, S.Si.
101.	Rani Trisnawati	Univ. Andalas Fak. Teknik Pertanian	Mapping of Avalanche Prone Areas in South Solok District	KMD	Armaiki Yusmur, S.Si.
102.	Mita Lerina	Univ. Andalas Fak. Teknik Pertanian	Potential of Rainfed Lowland Field in Padang Pariaman District	KMD	Armaiki Yusmur, S.Si
103.	Rival Lidra	Univ. Andalas Fak. Teknik Pertanian	Analysis of Paddy Field Changes in Pasaman Barat District in 2017 to 2011	KMD	Armaiki Yusmur, S.Si.
104.	Anggely Putry	Univ. Andalas Fak. Teknik Pertanian	Land Suitability Analysis for Sweetwood Crops Development	KMD	Armaiki Yusmur, S.Si.
105.	Anisa Fujianti	SMK Amaliah 2 Bogor	Office Administration	FAD	Ira Mutiara, SE.
106.	Serly Agustina	SMK Amaliah 2 Bogor	Office Administration	GAD	Lidia Defita, S.Kom.
107.	Anggi Elgiawati Putri	SMK Amaliah 2 Bogor	Office Administration	Cooperative	Vina
108.	Nurul Hikmah	SMK Amaliah 2 Bogor	Office Administration	PDSD	Novi Mayasari
109.	Sarah Putri Tania	SMK Amaliah 2 Bogor	Office Administration	PDSD	Novi Mayasari
110.	Andi Supiandi	SMK N 1 Cikalon Kulon	Plant Cultivation using Tissue Culture Technique and Edible Oyster Mushroom Cultivation	Plant Tissue Culture Laboratory/Edible Mushroom Cultivation	Samsul A.yani, S.Si.

111.	Hilman Fridaus	SMK N 1 Cikalon Kulon	Plant Cultivation using Tissue Culture Technique and Edible Oyster Mushroom Cultivation	Plant Tissue Culture Laboratory/Edible Mushroom Cultivation	Samsul A. Yani, S.Si.
112.	Nurul Amilah	SMK N 1 Cikalon Kulon	Plant Cultivation using Tissue Culture Technique and Edible Oyster Mushroom Cultivation	Plant Tissue Culture Laboratory/Edible Mushroom Cultivation	Samsul A. Yani, S.Si.
113.	Siti Aisah Andini	SMK N 1 Cikalon Kulon	Plant Cultivation using Tissue Culture Technique and Edible Oyster Mushroom Cultivation	Plant Tissue Culture Laboratory/Edible Mushroom Cultivation	Samsul A. Yani, S.Si.
114.	Siti Risa hamilatu Ahadiah	SMK N 1 Cikalon Kulon	Plant Cultivation using Tissue Culture Technique and Edible Oyster Mushroom Cultivation	Plant Tissue Culture Laboratory/Edible Mushroom Cultivation	Samsul A. Yani, S.Si.
115.	Meifie Nuur Aafiyah	Univ Jenderal Soedirman Fak Biologi	Plant Cultivation using Tissue Culture Technique	Plant Tissue Culture Laboratory	Samsul A. Yani, S.Si.
116.	Muhammad Ilham	Univ Jenderal Soedirman Fak Biologi	Plant Cultivation using Tissue Culture Technique	Plant Tissue Culture Laboratory	Samsul A. Yani, S.Si.
117.	Wira Dhyaksa Praanda	Univ Jenderal Soedirman Fak Biologi	Plant Cultivation using Tissue Culture Technique	Plant Tissue Culture Laboratory	Samsul A. Yani, S.Si.
118.	Muhammad Chandra Febriansyah	Univ Jenderal Soedirman Fak Biologi	Plant Cultivation using Tissue Culture Technique	Plant Tissue Culture Laboratory	Samsul A. Yani, S.Si.
119.	Lia Yulianasari	Univ Jenderal Soedirman Fak Biologi	Plant Cultivation using Tissue Culture Technique	Plant Tissue Culture Laboratory	Samsul A. Yani, S.Si.
120.	Cici Farhana Ambarwanty Mohtar	Univ Jenderal Soedirman Fak Biologi	Development of Oyster Mushroom (*Pleurotus ostreatus*) Mycellium in Edible Mushroom Cultivation	Edible Mushroom Cultivation	Erina Sulistiani, M.Si.
121.	Dias Puspa Rani	Univ Jenderal Soedirman Fak Biologi	Development of Brown Oyster Mushroom (*Pleurotus cystidiosus*) Mycellium in Edible Mushroom Cultivation	Edible Mushroom Cultivation	Erina Sulistiani, M.Si.
122.	Nadya Sofia Sa'adah	Univ Jenderal Soedirman Fak Biologi	Antagonistic Test of Yeast on the Growth of *Aspergillus ochraceus*	Phytopathology Laboratory	Ir. Ina Retnowati
123.	Chita Kusumawati	Univ Jenderal Soedirman Fak Biologi	Antagonistic Test of Yeast on the Growth of *Aspergillus niger*	Phytopathology Laboratory	Ir. Ina Retnowati
124.	Yasmin Shafira Nur Azizah	Univ Jenderal Soedirman Fak Biologi	Water Quality Test Microbiologically	Water and Air Laboratory	Budi Cahyadi, S.Si.
125.	Fiki Subhan M	SMK Geo Informatika	Mapping using GIS System	KMD	Armaiki Yusmur, M.Si.
126.	Isni Nuruk Rochman	SMK Geo Informatika	Mapping using GIS System	KMD	Armaiki Yusmur, M.Si.

127.	Yulieta Febrina Sari	Univ. Andalas FMIPA		Mycorrhiza Laboratory	Dr. Dewi Wulandari
128.	Suci Rahmaandi Putri	Univ. Andalas FMIPA	Effect of Organic and Inorganic Nutrition on the Growth of Green Spinach using Hydroponics System	Hydroponics	Riana Hartati, S.Si.
129.	Rizna Wita	Univ. Andalas FMIPA	Effect of Organic and Inorganic Nutrition on the Growth of Red Spinach (*Amaranthus tricolor* L.) using Hydroponics NFT (Nutrient Film Technique)	Hydroponics	Riana Hartati, S.Si.
130.	Putri Aliyyanti	Univ. Andalas FMIPA	Effect of Organic and Inorganic Nutrition on Kangkung Growth using Hydroponics System	Hydroponics	Riana Hartati, S.Si.
131.	Ridho Fernando	Univ. Andalas FMIPA	Effect of Organic and Inorganic Nutrition on Romane Lettuce Growth using Hydroponics System	Hydroponics	Riana Hartati, S.Si.
132.	Ahmad Andi Pujasuma	SMKN 63 Jakarta	Plant Cultivation using Tissue Culture Techniques, Edible Oyster Mushroom Cultivation, and Plant Cultivation using Hydroponics Techniques	Plant Tissue Culture Laboratory, Edible Mushroom Cultivation, Hydroponics	Erina Sulistiani, M.Si .and Riana Hartati, S.Si.
133.	Sifa Nabila	SMKN 63 Jakarta	Plant Cultivation using Tissue Culture Techniques, Edible Oyster Mushroom Cultivation, and Plant Cultivation using Hydroponics Techniques	Plant Tissue Culture Laboratory, Edible Mushroom Cultivation, Hydroponics	Erina Sulistiani, M.Si. and Riana Hartati, S.Si.
134.	Ricky Muhamad R	SMKN 63 Jakarta	Plant Cultivation using Tissue Culture Techniques, Edible Oyster Mushroom Cultivation, and Plant Cultivation using Hydroponics Techniques	Plant Tissue Culture Laboratory, Edible Mushroom Cultivation, Hydroponics	Erina Sulistiani, M.Si. and Riana Hartati, S.Si.
135.	Mareta Puspita Arianie	SMKN 63 Jakarta	Plant Cultivation using Tissue Culture Techniques, Edible Oyster Mushroom Cultivation, and Plant Cultivation using Hydroponics Techniques	Plant Tissue Culture Laboratory, Edible Mushroom Cultivation, Hydroponics	Erina Sulistiani, M.Si. and Riana Hartati, S.Si.
136.	Intan Nurcahyani	SMKN 63 Jakarta	Plant Cultivation using Tissue Culture Techniques, Edible Oyster Mushroom Cultivation, and Plant Cultivation using Hydroponics Techniques	Plant Tissue Culture Laboratory, Edible Mushroom Cultivation, Hydroponics	Erina Sulistiani, M.Si. and Riana Hartati, S.Si.
137.	Robi Ajwar Syah	SMKN 63 Jakarta	Plant Cultivation using Tissue Culture Techniques, Edible Oyster Mushroom Cultivation, and Plant Cultivation using Hydroponics Techniques	Plant Tissue Culture Laboratory, Edible Mushroom Cultivation, Hydroponics	Erina Sulistiani, M.Si. and Riana Hartati, S.Si.

138.	Adi Santoso	IPB Teknik Komputer (D3)	Smart Hydroponic Greenhouse	KMD	Armaiki Yusmur, S.Si. and Lukman Haris, S.Si.
139.	Erista Agustiani	IPB Teknik Komputer (D3)	Smart Hydroponic Greenhouse	KMD	Armaiki Yusmur, S.Si. and Lukman Haris, S.Si.
140.	Heroita Hutabarat	IPB Teknik Komputer (D3)	Smart Hydroponic Greenhouse	KMD	Armaiki Yusmur, S.Si. and Lukman Haris, S.Si.
141.	Aldila Romdona Subagja	IPB Teknik Komputer (D3)	Smart Hydroponic Greenhouse	KMD	Armaiki Yusmur, S.Si. and Lukman Haris, S.Si.
142.	Dzikrina Istifarah	IPB Teknik Komputer (D3)	Smart Hydroponic Greenhouse	KMD	Armaiki Yusmur, S.Si. and Lukman Haris, S.Si.
143.	Arafah Nur Salma Luvika	SMAK Bogor	Water Quality Testing	Water and Air Laboratory	Budi Cahyadi, S.Si.
144.	Rifka Fachrunnisa	SMAK Bogor	Analysis of Ambient Air Conditions	Water and Air Laboratory	Budi Cahyadi, S.Si.
145.	Icmi Purnami	SMAK Bogor	Wastewater Quality Testing	Water and Air Laboratory	Budi Cahyadi, S.Si.
146.	Citra	SMAK Bogor	Waste Management	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
147.	Retno	SMAK Bogor	Waste Management	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
148.	Indah	SMAK Bogor	Waste Management	Food and Feed Laboratory	Ratnaningsih, S.Si.
149.	So Aduon Bonanta Sianipar	Univ Riau	Red Seaweed Tissue Culture	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
150.	Nahdya Nasri Ananda	Univ Riau	Mapping of Seagrass Distribution in Enggano Island, Bengkulu Province	Remote Sensing Laboratory	Slamet Widodo, S.Si.
151.	Novhitasari Simbolon	Univ Riau	Bathymetry Mapping of Bengkalis Island and Padang Island in Riau Province	Remote Sensing Laboratory	Slamet Widodo, S.Si.
152.	Almaarif Paniska	Univ Riau	Mapping of Coral Reef Distribution in Derawan Island Region	Remote Sensing Laboratory	Slamet Widodo, S.Si.
153.	Windy Anjeli Hutahean	Univ Riau	Mapping of Tanjung Balai Mangrove Distribution, Asahan District	Remote Sensing Laboratory	Slamet Widodo, S.Si.
154.	Tri Setia Darma Sinuraya	Univ Riau	Soft Coral Extraction Technique (*Sinularia* sp.)	Natural Product Laboratory	Jonner Situmorang, M.Si.
155.	May Juna Putri Tanjung	Univ Riau	Soft Coral Extraction Technique (*Sinularia* sp.) as Anti-cancer Substances	Natural Product Laboratory	Jonner Situmorang, M.Si.
156.	Kristanti Tampubolon	Univ Riau	Artemia Culture Technique in Laboratory Scale	Natural Product Laboratory	Jonner Situmorang, M.Si.
157.	Joenathan Sarumpaet	Univ Riau	Phytoplankton *Tetraselmis* sp. Culture Technique	Natural Product Laboratory	Jonner Situmorang, M.Si.

158.	Farida Syifa Alfuadah	UGM Fak Pertanian	Analysis of Physical and Chemical Properties of Soil Samples	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
159.	Charina Wijayanti	UGM Fak Pertanian	Analysis of Soil Fertility and Biotechnology	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
160.	M Agung Basyar	UGM Fak Pertanian	Waste Management and Analysis	Water and Air Laboratory	Budi Cahyadi, S.Si.
161.	Haning Anggunira	IPB Fahutan (S1)	Development of Student Ability in Cultivation of Citronella Fragrance	Natural Product Laboratory	Jonner Situmorang
162.	Ahmad Trijunianto	IPB Fahutan (S1)	Development of Student Ability in Cultivation of Citronella Fragrance	Natural Product Laboratory	Jonner Situmorang
163.	Putri Maharani	IPB Fahutan (S1)	Development of Student Ability in Cultivation of Citronella Fragrance	Natural Product Laboratory	Jonner Situmorang
164.	Annas Abi Hamzah	IPB Fahutan (S1)	Development of Student Ability in Cultivation of Citronella Fragrance	Natural Product Laboratory	Jonner Situmorang
165.	Deka Nanda	Politeknik Pertanian Negeri Pangkajene and Kepulauan	Natural Eau de Toilette Perfume Formulation using Patchouli Oil as Fixatip	Natural Product Laboratory	Jonner Situmorang
166.	Hasrin	Politeknik Pertanian Negeri Pangkajene and Kepulauan	Optimization of Transparent Soap Made of Citronella Scented with Gaharu Hydrosol Additive	Natural Product Laboratory	Jonner Situmorang
167.	Huzari Baba	Politeknik Pertanian Negeri Pangkajene and Kepulauan	Distillation of Some Types of Plants Producing Essential Oils for Making Men's Perfume	Natural Product Laboratory	Jonner Situmorang
168.	Azies Setiawan	Univ. Muhammadiyah Jakarta	Edible Oyster Mushroom Cultivation	Edible Mushroom Cultivation	Erina Sulistiani, M.Si.
169.	Retno Putri Wulandari	IPB Diploma Analis Kimia	Waste Management	Water and Air Laboratory	Budi Cahyadi, S.Si.
170.	Anisa Rahmania Br Karo	IPB Diploma Analis Kimia	Waste Management	Water and Air Laboratory	Budi Cahyadi, S.Si.
171.	Ari Priatin Satrio Wibowo	IPB Diploma Analis Kimia	Waste Management	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
172.	Desti Qhadata	IPB Fak. Teknologi Pertanian	Development of Edible Mushroom Processing	Edible Mushroom Cultivation	Erina Sulistiani, M.Si.
173.	Carmela Suansing	Cebu University Filipina	Plant Cultivation using Tissue Culture Technique	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
174.	Tia Amelia	SMKN 2 Cilaku Cianjur	Waste Management	Water and Air Laboratory	Budi Cahyadi, S.Si.
175.	Lungguh Sri Astuti	SMKN 2 Cilaku Cianjur	Waste Management	Food and Feed Laboratory	Ratnaningsih, S.Si.
176.	Ai Sumiyati	SMKN 2 Cilaku Cianjur	Waste Management	Soil and Plant Laboratory	Eko Purwiyanto, S.S.
177.	Agni Noor Muhamad	Univ. Jenderal Soedirman FPIK	Remote Sensing (GIS)	Remote Sensing Laboratory	Slamet Widodo, S.Si.
178.	Fina Finarti	SMK Bhakti Insani	Office Administration	FMD	Lastiah

179.	Irfan Maulana	SMK Bhakti Insani	Office Administration	Cooperative	Elvina Rahayu
180.	Titi Supriyani	SMK Bhakti Insani	Office Administration	GAD	Lidia Defita, S.Kom.
181.	Yani Gustriani S	SMK Bhakti Insani	Office Administration	CBD	Dewanti Pratiwi, S.Hut
182.	Rina Agustin Murdianti	IPB Fahutan (S1)	Hydroponics Cultivation, Lemongrass Extraction, and Edible Mushroom Cultivation	Hydroponics, Natural Product Laboratory, Edible Mushroom Cultivation	Riana Hartati, S.Si., Jonner Situmorang, M.Si.
183.	Desty Sasana P.U	IPB Fahutan (S1)	Hydroponics Cultivation, Lemongrass Extraction, and Edible Mushroom Cultivation	Hydroponics, Natural Product Laboratory, Edible Mushroom Cultivation	Riana Hartati, S.Si., Jonner Situmorang, M.Si.
184.	Eriza Falashifa	IPB Fahutan (S1)	Hydroponics Cultivation, Lemongrass Extraction, and Edible Mushroom Cultivation	Hydroponics, Natural Product Laboratory, Edible Mushroom Cultivation	Riana Hartati, S.Si., Jonner Situmorang, M.Si.
185.	Lisa Widiastuti	IPB Fahutan (S1)	Hydroponics Cultivation, Lemongrass Extraction, and Edible Mushroom Cultivation	Hydroponics, Natural Product Laboratory, Edible Mushroom Cultivation	Riana Hartati, S.Si., Jonner Situmorang, M.Si.
186.	Dody Hafizudin	Madrasah Aliyah Fathan Mubina	Office Administration	PDSD	Novi Mayasari
187.	Ihsan Rahman	Madrasah Aliyah Fathan Mubina	Office Administration	PDSD	Novi Mayasari
188.	Annisa Nur Rahma Fauzia	Madrasah Aliyah Fathan Mubina	Office Administration	HRMD	Yunita, SP.
189.	Septia Agustina Pratiwi	Madrasah Aliyah Fathan Mubina	Office Administration	KMD	Tika Tresnawati, M.Si.
190.	Ria Fitriani	Madrasah Aliyah Fathan Mubina	Office Administration	IndoBiC	Ryna Mardiana, S.Si.
191.	M. Rafli Pramudya	SMK Mekanik Cibinong	Computer and Network Infrastructure at SEAMEO BIOTROP	KMD/MIT	Lukman Haris, S.Si.
192.	M. Rafli	SMK Mekanik Cibinong	Computer and Network Infrastructure at SEAMEO BIOTROP	KMD/MIT	Lukman Haris, S.Si.
193.	Wisnu Tata N	SMK Mekanik Cibinong	Computer and Network Infrastructure at SEAMEO BIOTROP	KMD/MIT	Lukman Haris, S.Si.
194.	Bagas Bimantoro	SMK Mekanik Cibinong	Computer and Network Infrastructure at SEAMEO BIOTROP	KMD/MIT	Lukman Haris, S.Si.

195.	Abdul Aziz	Surya University	Remote Sensing (GIS)	Remote Sensing Laboratory	Slamet Widodo, S.Si.
196.	Nasrul Friamsa, SP	Balai Karantina Pertanian Kelas II Cilegon	Identification and Collection of OPT/OPTK Weed Group	Herbarium	Dr. Sri Sudarmiyati
197.	Anis Mutirani, S.Si	Balai Karantina Pertanian Kelas II Cilegon	Identification and Collection of OPT/OPTK Weed Group	Herbarium	Dr. Sri Sudarmiyati
198.	Utami Megawati	STEIK (S1)		FAD	Rima Febriana, SE.
199.	Anggi Gilang	STEIK (S1)		FAD	Rima Febriana, SE.
200.	Indrianka Seza Rianto	Univ. Pelita Harapan (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
201.	Tommy Husein	Univ. Pelita Harapan (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
202.	Stephen Ng	Univ. Pelita Harapan (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
203.	James Wijaya	Univ. Pelita Harapan (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory	Erina Sulistiani, M.Si.
204.	Juli Helena Pandiangan	Universitas Jambi (S1)	Plant Cultivation using Hydroponics System	Hydroponics	Riana Hartati, S.Si.
205.	Pebriani Simbolon	Universitas Jambi (S1)	Plant Cultivation using Hydroponics System	Hydroponics	Riana Hartati, S.Si.
206.	Elnewa	Universitas Jambi (S1)	Plant Cultivation using Hydroponics System	Hydroponics	Riana Hartati, S.Si.
207.	Asmawarni	Universitas Jambi (S1)	Remote Sensing (GIS)	Remote Sensing and Ecology Laboratory	Slamet Widodo, S.Si.
208.	Estrelita Nababan	Universitas Jambi (S1)	Remote Sensing (GIS)	Remote Sensing and Ecology Laboratory	Slamet Widodo, S.Si.
209.	Muhammad Khairazzad	Universitas Jambi (S1)	Remote Sensing (GIS)	Remote Sensing and Ecology Laboratory	Slamet Widodo, S.Si.
210.	M. Hasbi Abdillah	Universitas Jambi (S1)	Remote Sensing (GIS)	Remote Sensing and Ecology Laboratory	Slamet Widodo, S.Si.
211.	Rizal	SMK Terpadu Al-Ittihad	Waste Management	Water and Air Laboratory	Arif Nuryadin, B.Sc.
212.	Rifki	SMK Terpadu Al-Ittihad	Waste Management	Water and Air Laboratory	Arif Nuryadin, B.Sc.
213.	Zulfi Ali Akbar	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Tissue Culture Techniques and Edible Oyster Mushroom Cultivation	Plant Tissue Culture Laboratory/ Edible Mushroom Cultivation	Erina Sulistiani

214.	Novita Ramadhani	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory/ Edible Mushroom Cultivation	Erina Sulistiani
215.	Iwan Setiawan	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory/ Edible Mushroom Cultivation	Erina Sulistiani
216.	Ririn Suryani	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory/ Edible Mushroom Cultivation	Erina Sulistiani
217.	Mira Mutiara	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory/ Edible Mushroom Cultivation	Erina Sulistiani
218.	Muflih Rahmat Hudi	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory/ Edible Mushroom Cultivation	Erina Sulistiani
219.	Siti Sapuroh	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory/ Edible Mushroom Cultivation	Erina Sulistiani
220.	Khairul Razaq AR	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Tissue Culture Techniques	Plant Tissue Culture Laboratory/ Edible Mushroom Cultivation	Erina Sulistiani
221.	Mutia Syafira	UIN Bandung Fak. Sains and Teknologi (S1)		Phytopathology Laboratory	Ir. Ina Retnowati
222.	Nafisah Tsamrotul F	UIN Bandung Fak. Sains and Teknologi (S1)		Phytopathology Laboratory	Ir. Ina Retnowati
223.	Novia Rahmawati	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Hydroponics System	Hydroponics	Riana Hartati, S.Si.
224.	Resti Winda Putri	UIN Bandung Fak. Sains and Teknologi (S1)	Plant Cultivation using Hydroponics System	Hydroponics	Riana Hartati, S.Si.
225.	Yogie Luciandy	UKI Atmajaya (S1)		Biotechnology Laboratory	Dewi Rahmawati, M.Si.
226.	Bagas Christanto Kurniawan	UKI Atmajaya (S1)		Biotechnology Laboratory	Dewi Rahmawati, M.Si.
227.	Erica	UKI Atmajaya (S1)		Mycorrhiza Laboratory	Risa Rosita, S.Si.
228.	Adrina Weisa	UKI Atmajaya (S1)		Mycorrhiza Laboratory	Risa Rosita, S.Si.
229.	Salsadila H.W.	SMK Farmako Medika Plus	Waste Management	Food and Feed Laboratory	Ratnaningsih, S.Si.

230.	Selvia Wahyuni	SMK Farmako Medika Plus	Waste Management	Water and Air Laboratory	Budi Cahyadi, S.Si.
231.	Muhammad Wahyu	SMK Farmako Medika Plus	Waste Management	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.
232.	Muhammad Bayan	SMK Farmako Medika Plus	Waste Management	Soil and Plant Laboratory	Arif Nuryadin, B.Sc.

Appendix 5. BIOTROP Publications in FY 2017/2018

Articles and Refereed Journals

Agus C, **Wulandari D**, Primananda E, Hendryan A, Harianja V. 2017. The role of soil amendment on tropical post tin mining area in Bangka Island Indonesia for dignified and sustainable environment and life. IOP Conf Ser: Earth Environ Sci 83:012030. doi: 10.1088/1755-1315/83/1/012030.

Dharmaputra OS, Sudirman LI, Ratnaningsih EA. 2018. Mikobiota pada buah pisang kultivar Lampung untuk pengendalian hayati *Fusarium semitectum* [Mycobiota on banana fruits Lampung cultivar for biological control of *Fusarium semitectum*]. Jurnal Fitopatologi Indonesia 14(1):30-8.

Dharmaputra OS, Ambarwati S, Retnowati I, Nurfadila N. 2018. Determining appropriate postharvest handling method to minimize fungal infection and aflatoxin contamination in nutmeg (*Myristica fragrans*). IFRJ 25(2):545-52.

Gholib, Heistermann M, Agil M, Supriatna I, **Purwantara B**, Nugraha TP, Engelhardt A. 2018. Comparison of fecal preservation and extraction methods for steroid hormone metabolite analysis in wild crested macaques. Primates 59(3):281-92.

Nurtjahja K, **Dharmaputra OS**, Rahayu WP, Syarief R. 2017. Fungal population of nutmeg (*Myristica fragrans*) Kernels affected by water activity during storage. Agritech 37(3):288-94.

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Appendix 6. Scientific Training Courses, Workshops, Conferences and Symposia Attended by SEAMEO BIOTROP Staff Members during FY 2017/2018

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
1.	M. Tajudin, M.M.	Workshop on 2nd Quarter Reporting FY 2017 Under Government Regulation 39/2006	Bekasi, 20 - 22 July 2017	
2.	Jonner Situmorang, M.Si.	Seminar on "Gaharu: The Future"	Malaysia, 20 - 23 July 2017	Resource Person
3.	Rosianadewi Dinaryanti, M.Si.	Seminar and workshop on Coaching of Extracurricular Activities in Elementary School	Jakarta, 21 July 2017	Resource Person
4.	Riana Hartati, S.Si.	Seminar and workshop on Coaching of Extracurricular Activities in Elementary School	Jakarta, 21 July 2017	Resource Person
5.	Didi Junaedi, A.Md.	Training on Vegetable Cultivation and Nutrition Garden Monitoring of SEAMEO RECFON	Jakarta, 24 July 2017	Resource Person
6.	T. Heriyanto	Training on Security Certification	Jakarta, 15, 16, 22, 23, 29, 30 July 2017 and 5-6 August 2017	
7.	Kurniawan	Training on Security Certification	Jakarta, 15, 16, 22, 23, 29, 30 July 2017 and 5-6 August 2017	
8.	M. Hasanudin	Training on Security Certification	Jakarta, 15, 16, 22, 23, 29, 30 July 2017 and 5-6 August 2017	
9.	Ichwan Pidin	Training on Security Certification	Jakarta, 15, 16, 22, 23, 29, 30 July 2017 and 5 - 6 August 2017	
10.	Dr. Dewi Wulandari	Seminar and Workshop on Photosynthesis Analyzers Tool	Bogor, 4 August 2017	
11.	Harry Imantho, M.Sc.	Training on the 2nd Phase of Geographic Information System (GIS) for the Improvement of Government Capacity in PMAP#7 Project Working Area	Pekanbaru, 7 - 11 August 2017	Resource Person
12.	Dr. Dewi Wulandari	International Seminar on Current Development on Mine Reclamation and Mine Water Management	Palembang, 10 - 11 August 2017	
13.	Dr. Irdika Mansur, M. For.Sc.	National Seminar on Silviculture	Jakarta, 22 - 23 August 2017	
14.	Wheni Haslinawati, M.Biotech.	Advanced Technical Guidance on Procurement of Goods/Services	Bandung, 22 - 25 August 2017	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
15.	Risa Rosita, S.Si.	Workshop on Preservation and Identification of Fungi	LIPI Cibinong, 23 - 24 August 2017	
16.	Dr. Jesus C. Fernandez	The 2nd Young SEA-TVET Symposium: Young Smart Farmers	Thailand, 29 August - 2 September 2017	
17.	Riana Hartati, S.Si.	The 2nd Young SEA-TVET Symposium: Young Smart Farmers	Thailand, 29 August - 2 September 2017	
18.	Haritz Cahya Nugroho, M.T.	SEAMEO Online Lecture Series and Training Programmes	SEAMES Bangkok, 3 - 15 September 2017	
19.	Indah Wahyuni, M.Si.	Training on Herbarium Collection Management	LIPI Cibinong, 7 - 8 September 2017	
20.	Dr. Jesus C. Fernandez	Discussion on the Plant Genetic Resources Conservation Strategy in Supporting Food Security and Agriculture in Indonesia	Bogor, 8 September 2017	
21.	Samsul A. Yani, S.Si.	Technical Guidance on Certification and Administration of Forest Seed Distribution	Bandung, 12 - 15 September 2017	
22.	Indah Wahyuni, M.Si.	The 4th National Biological Seminar - Indonesian Biodiversity and Tropical Ecology and the 12th Indonesian Plant Taxonomy Congress (BIOETI 4 & PPTI XII)	Universitas Andalas, Padang, 14 - 18 September 2017	
23.	Dr. Soekisman Tjitrosemito	The 26th APWS Conference	Kyoto, 18 - 23 September 2017	
24.	Dr. Sri Sudarmiyati Tjitro Soedirdjo	The 26th APWS Conference	Kyoto, 18 - 23 September 2017	
25.	Dr. Jesus C. Fernandez	Summer Course Program 2017 with the theme Livestock a Driving Force for Food Security and Sustainable Development	Yogyakarta, 19 - 21 September 2017	Guest Lecturers
26.	Ujang Sanusi	The 3rd Phase of Socialization of Implementation of Reassessment Activities of State Property Year 2017	KPKNL Tangerang, 20 September 2017	
27.	Dr. Dewi Wulandari	Internal Seminar of Researchers Forum	BP2TPTH Bogor, 25 September 2017	
28.	Bambang Sulistio, S. Si	Strengthening the E-procurement Implementation	Bogor, 25 - 27 September 2017	
29.	Rosianadewi Dinaryanti, M.Si.	Focus Group Discussion (FGD) on Guidance Preparation for Implementation of Extracurricular Activities in Elementary School in 2017	Jakarta, 26 - 29 September 2017	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
30.	Riana Hartati, S.Si.	Focus Group Discussion (FGD) on Guidance Preparation for Implementation of Extracurricular Activities in Elementary School in 2017	Jakarta, 26 - 29 September 2017	
31.	Bambang Sulistio, S.Si.	Workshop on Financial Coordination for September 2017 Period	SEAQIL, 3 - 5 October 2017	
32.	Herman Apriyadi, S.E.	Workshop on Financial Coordination for September 2017 Period	SEAQIL, 3 - 5 October 2017	
33.	Supriyatno, A.Md.	Workshop on Financial Coordination for September 2017 Period	SEAQIL, 3 - 5 October 2017	
34.	Hasan Husen	Training on Security Certification	Jakarta, 7, 8, 14, 15, 21, 22, 28 and 29 October 2017	
35.	Kusnadi	Training on Security Certification	Jakarta, 7, 8, 14, 15, 21, 22, 28 and 29 October 2017	
36.	Riana Hartati, S.Si.	National Food Symposium and "Chili" Book Review	Jakarta, 18 October 2017	
37.	Zanne Sandriati Putri, S.Si.	The 7th AIC-ICMR on Health and Life Sciences	Banda Aceh, 18 - 20 October 2017	
38.	Tika Tresnawati, M.Si.	International Conference on Food Security Innovations	Serang, 18 - 20 October 2017	Resource person
39.	Woro Kanti Darmastuti, M.Si.	Workshop on Senayan Library Management System (SLiMS) and Institution Repository	MoEC Library, Jakarta, 19 - 21 October 2017	
40.	Dr. Dewi Wulandari	Internal Seminar of Researchers Forum	Bogor, 24 October 2017	
41.	Prof. Dr. Okky S. Dharmaputra	National Seminar on Marine and Fisheries	Jakarta, 24 October 2017	
42.	Armaiki Yusmur, S.Si.	FGD on Development of SMK Geomatika Curriculum as well as Higher Education and Geodesy/Geomatics Engineering Vocational School Syllabus Based on SKKNI Geographic Information	Bogor, 25 October 2017	
43.	Zanne Sandriati Putri, S.Si.	The 3rd International Conference of Indonesia Society for Remote Sensing (ICOIRS)	Semarang, 31 October – 1 November 2017	Resource person
44.	Santi Ambarwati, M.Si.	Seminar on Food Safety Risk Analysis	Jakarta, 1 November 2017	
45.	Yunita, S.P.	Training on Job Analysis and Job Description Based on Competency and KPI	Yogyakarta, 1 - 3 November 2017	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
46.	Dr. Soekisman Tjitrosemito	Workshop on Bamboo as Future Export Commodities	Jakarta, 2 November 2017	
47.	Bambang Sulistio, S.Si.	Workshop on Budget Planning and BMN Evaluation	Tangerang, 10 - 11 November	
48.	M. Tajudin, M.M.	Workshop on Budget Planning and BMN Evaluation	Tangerang, 10 - 11 November	
49.	Riana Hartati, S.Si.	Training on Competence Improvement for SLB Teachers and Inclusion of Cooperation of PPPPTK TK and PLB with SEAMEO SEN	Bandung, 13 - 14 November 2017	Resource Person
50.	Santi Ambarwati, M.Si.	Training on Management Understanding and Technical of ISO / IEC 17025: 2005	Bali, 15 - 17 November 2017	Resource Person
51.	Bambang Sulistio, S.Si.	Training on Contract Preparation, Specification, and Self-Estimating Price	NTT, 21 - 24 November 2017	
52.	Supriyatno, A.Md.	Training on Contract Preparation, Specification, and Self-Estimating Price	NTT, 21 - 24 November 2017	
53.	Wheni Haslinawati, M.Biotech.	Training on Contract Preparation, Specification, and Self-Estimating Price	NTT, 21 - 24 November 2017	
54.	Wati Madyawati	Training on Contract Preparation, Specification, and Self-Estimating Price	NTT, 21 - 24 November 2017	
55.	Tika Tresnawati, M.Si.	Training on Foreign Guest Protocol	Banten, 22 - 24 November 2017	
56.	Riana Hartati, S.Si.	Training on Hydroponics	Banten, 23 November 2017	Resource Person
57.	M. Tajudin, M.M.	Workshop on Control of Program and Activities Implementation of MoEC FY 2017	Bogor, 23 - 25 November 2017	
58.	Budiyono	Training on Hydroponics	Jakarta, 25 November 2017	
59.	Nurdiansyah	Training on Hydroponics	Jakarta, 25 November 2017	
60.	Indrajit	Training on Hydroponics	Jakarta, 25 November 2017	
61.	Lidia Defita, S.Kom.	Workshop on Electronic Mail Application	SEAMOLEC, 27 November 2017	
62.	Lukman Haris, S.Si.	Workshop on Electronic Mail Application	SEAMOLEC, 27 November 2017	
63.	Dr. Dewi Wulandari	Internal Seminar of Researchers Forum	Bogor, 27 November 2017	
64.	Rosianadewi Dinaryanti, M.Si.	Workshop on Materials of Entrepreneurship Competence	Bandung, 7 - 8 December 2017	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
65.	Riana Hartati, S.Si.	Workshop on Development of Authentic Assessment in Learning in the 21st Century	Bandung, 12 - 14 December 2017	
66.	M. Tajudin, M.M.	Workshop on Simproka Data Input 2017	Bogor, 11 - 13 December 2017	
67.	Bambang Sulistio, S.Si.	Training on MoEC SIMPel Application	Jakarta, 20 December 2017	
68.	Wati Madyawati	Training on MoEC SIMPel Application	Jakarta, 20 December 2017	
69.	Lukman Haris, S.Si.	Training on MoEC SIMPel Application	Jakarta, 20 December 2017	
70.	Dr. Jesus C. Fernandez	Regional Workshop on the Governance Structure and Processes for the APIRAS Network	Jakarta, 22 - 23 January 2018	
71.	Dr. Jesus C. Fernandez	Regional Workshop in Enhancing Food Security in Southeast Asia Through Extension and Agricultural Advisory Services	Jakarta, 25 - 26 January 2018	
72.	Dewi Rahmawati, M.Si.	Seminar on Reflection and Future of Agricultural Biotechnology in Supporting Food Sovereignty in Indonesia	Jakarta, 29 January 2018y	
73.	Santi Ambarwati, M.Si.	Public Training on Understanding Lab Management System. ISO/IEC 17025: 2017	Bogor, 6 - 7 February 2018	
74.	Yuni Puspita Sari, M.M.	Workshop and National Seminar on Functional Position	IPB Dramaga, 8 - 9 February 2018	
75.	Ujang Sanusi	Technical Guidance on Procedures and Control of State Property Year 2018	KPKNL Tangerang, 8 February 2018	
76.	Anidah, S.Si.	Research Seminar	Puslitbang Tanaman Pangan Bogor, 8 February 2018	
77.	Dewi Rahmawati, M.Si.	Research Seminar	Puslitbang Tanaman Pangan Bogor, 8 February 2018	
78.	Bambang Sulistio, S.Si.	Technical Guidance on SIMPel Application Usage	MoEC, 14 February 2018	
79.	Wati Madyawati	Technical Guidance on SIMPel Application Usage	MoEC, 14 February 2018	
80.	Lukman Haris, S.Si.	Technical Guidance on SIMPel Application Usage	MoEC, 14 February 2018	
81.	Dr. Zulhamsyah Imran	Inter Centre Collaboration Meeting	Yogyakarta, 1-3 March 2018	
82.	Dr. Jesus C. Fernandez	Inter Centre Collaboration Meeting	Yogyakarta, 1 - 3 March 2018	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
83.	Bambang Sulistio, S.Si.	Inter Centre Collaboration Meeting	Yogyakarta, 1 - 3 March 2018	
84.	M. Tajudin, M.M.	Inter Centre Collaboration Meeting	Yogyakarta, 1 - 3 March 2018	
85.	Sri I. Soerianegara, M.Sc.	Training on Foreign Guest Protocol	Jakarta, 14 - 16 March 2018	
86.	Fitri Junaedy, S.E.I.	Training on Foreign Guest Protocol	Jakarta, 14 - 16 March 2018	
87.	Wati Madyawati	Technical Guidance on Implementation of Direct Procurement Management Information System (SIMPel)	NTB, 14 - 16 March 2018	
88.	Lukman Haris, S.Si.	Technical Guidance on Implementation of Direct Procurement Management Information System (SIMPel)	NTB, 14 - 16 March 2018	
89.	Samsul A. Yani, S.Si.	Training on Making Root Hormone	Palembang, 19 - 21 March 2018	
90.	Bambang Sulistio, S.Si.	Workshop on Program, Activity and Budget Revisions 2018 Discussion	SEAMOLEC, 26 - 27 March 2018	
91.	Rima Febriana, S.E.	Workshop on Program, Activity and Budget Revisions 2018 Discussion	SEAMOLEC, 26 - 27 March 2018	
92.	M. Tajudin, M.M.	Workshop on Program, Activity and Budget Revisions 2018 Discussion	SEAMOLEC, 26 - 27 March 2018	
93.	Dr. Jesus C. Fernandez	Workshop on Preparation of 3rd FYDP 2020/2021-2021/2025	SEAQIS, 27 - 29 March 2017	Resource Person
94.	Tika Tresnawati, M.Si.	Workshop on Writing Clinic n Reputable International Journal for Lecturer of Faculty of Agriculture, University of Sultan Ageng Tirtayasa, Year 2018	Banten, 28 - 29 March 2018	Resource Person
95.	Riana Hartati, S.Si.	Training on Hydroponics	Universitas Trisakti, 29 March 2018	Resource Person
96.	Budiyono	Training on Hydroponics	Universitas Trisakti, 29 March 2018	Resource Person
97.	Sri Widayanti, M.Si.	Seminar on Proposal of Applied Test Year 2018	Balai Uji Terap Teknik and Metode Karantina Pertanian – Bekasi, 3 April 2018	
98.	Rima Febriana, S.E.	Workshop on Financial Monitoring and Evaluation of SEAMEO SEAMOLEC Working Unit for March 2018 Period	SEAQIL, 3 - 5 April 2018	
99.	Herman Apriyadi, S.E.	Workshop on Financial Monitoring and Evaluation of SEAMEO SEAMOLEC Working Unit for March 2018 Period	SEAQIL, 3 - 5 April 2018	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
100.	Supriyatno, A.Md.	Workshop on Financial Monitoring and Evaluation of SEAMEO SEAMOLEC Working Unit for March 2018 Period	SEAQIL, 3 - 5 April 2018	
101.	Sri Widayanti, M.Si.	International Conference	Jakarta, 4 - 5 April 2018	
102.	Herni Widhiastuti, S.Si.	International Conference	Jakarta, 4 - 5 April 2018	
103.	Dewi Rahmawati, M.Si.	Training Course on Bioenergy, Biorefinery, and Energy Efficiency	IPB ICC, 4 - 6 April 2018	
104.	Anidah, S.Si.	Seminar on the Role of the Lab in MUI Halal Certification	Jakarta, 4 April 2018	
105.	Fitri Junaedy, S.E.I.	Socialization and Training on New Edabu Version 3.1 Application	BPJS Kesehatan Bogor, 4 April 2018	
106.	Dr. Zulhamsyah Imran	Workshop on Preparation of Academic Paper and Workload Analysis (ABK) of SEAMEO Center Indonesia	SEAMOLEC, 5 - 6 April 2018	
107.	Bambang Sulistio, S.Si	Workshop on Preparation of Academic Paper and Workload Analysis (ABK) of SEAMEO Center Indonesia	SEAMOLEC, 5 - 6 April 2018	
108.	Samsul A. Yani, S.Si.	Training on Entrepreneur-produced School	Malang, 7 - 8 April 2018	Resource Person
109.	Jonner Situmorang, M.Si.	Training on Entrepreneur-produced School	Malang, 7 - 8 April 2018	Resource Person
110.	Lukman Haris, S.Si.	Skilled Human Resource Implementing BMN Management (Strengthening Implementation of SPSE E-Procurement version 4.2)	Jakarta, 10 - 12 April 2018	
111.	Dr. Zulhamsyah Imran	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
112.	Asep Syaefudin, S.E.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
113.	Bambang Sulistio, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
114.	Rima Febriana, S.E.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
115.	Samsul A. Yani, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
116.	Tenni Wahyuni, A.Md.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
117.	Wati Madyawati	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
118.	Erina Sulistiani, M.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
119.	Santi Ambarwati, M.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
120.	Tika Tresnawati, M.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
121.	Arif Nuryadin, B.Sc.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
122.	Ratnaningsih, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
123.	Armaiki Yusmur, M.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
124.	Lillys B. Yuliawati, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
125.	Risa Rosita, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
126.	Anidah, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
127.	Devi Septrianti, S.E.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
128.	Yunita, S.P.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
129.	Ira Mutiara, S.E.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
130.	Sri Ismawati Soerianegara, M.Sc.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
131.	Yuni Puspita Sari, M.M.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
132.	Lastiah	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
133.	Saiful Bachri, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
134.	Woro Kanti Darmastuti, M.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
135.	Zulkarnaen Noor Syarif, S.Kom.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
136.	Dewanti Pratiwi, S.Hut.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
137.	Haritz Cahya Nugraha, M.T.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
138.	Riana Hartati, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
139.	Nijma Nurfadila, S.Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
140.	Dewi Yuniati, M,Si.	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
141.	Peri Siantuni	Training on Internal Audit of Quality Management System SNI ISO 9001: 2015 Based on SNI ISO 19011: 2012	SEAMEO BIOTROP, 10 - 12 April 2018	
142.	Dr. Irdika Mansur	International Conference in School Gardens	SEAMEO SEARCA, 16 - 19 April 2018	
143.	Bambang Sulistio, S.Si.	Workshop on Report on the Implementation of Quarter I Development Plan T.A. 2018	SEAQIL, 23 - 24 April 2018	
144.	M. Tajudin, M.M.	Workshop on Report on the Implementation of Quarter I Development Plan T.A. 2018	SEAQIL, 23 - 24 April 2018	
145.	Samsul A. Yani, S.Si.	Technical Guidance on Development of Forest Plant Seed Center	Sumeandg, 24 April 2018	
146.	Dr. Irdika Mansur	Asian Aromatherapy Conference & Asian Aroma Ingredients Congress	Yogyakarta, 25 - 27 April 2018	
147.	Dr. Irdika Mansur	Mapping the Work Plan between SEAMEO Secretariat Bangkok, SEAMEO Center and UT	Universitas Terbuka Pamulang, 2 May 2018	
148.	Dr. Jesus C. Fernandez	Mapping the Work Plan between SEAMEO Secretariat Bangkok, SEAMEO Center and UT	Universitas Terbuka Pamulang, 2 May 2018	
149.	Armaiki Yusmur, M.Si.	Mapping the Work Plan between SEAMEO Secretariat Bangkok, SEAMEO Center and UT	Universitas Terbuka Pamulang, 2 May 2018	
150.	Dr. Zulhamsyah Imran	Inter Centre Collaboration Meeting 2018	Jakarta, 3 - 5 May 2018	
151.	Dr. Jesus C. Fernandez	Inter Centre Collaboration Meeting 2018	Jakarta, 3 - 5 May 2018	
152.	Rima Febriana, S.E.	Inter Centre Collaboration Meeting 2018	Jakarta, 3 May 2018	
153.	Tenni Wahyuni	Inter Centre Collaboration Meeting 2018	Jakarta, 3 May 2018	
154.	Dr. Irdika Mansur	Inter Centre Collaboration Meeting 2018	Jakarta, 4 May 2018	
155.	M. Tajudin, M.M.	Inter Centre Collaboration Meeting 2018	Jakarta, 4 May 2018	
156.	Jonner Situmorang, M.Si.	Training on Natural Soap and Perfume	Cipayung, 4 May 2018	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
157.	Iman	Training on Natural Soap and Perfume	Cipayung, 4 May 2018	
158.	Zanne Sandriati Putri, S.Si.	International Seminar SCIFIMAS 2018	Purwokerto, 7 - 9 May 2018	
159.	Herman Apriyadi, S.E.	Workshop on Financial Monitoring and Evaluation of SEAMEO SEAMOLEC Working Unit for April 2018 Period	Yogyakarta, 7 - 9 May 2018	
160.	Supriyatno, A.Md.	Workshop on Financial Monitoring and Evaluation of SEAMEO SEAMOLEC Working Unit for April 2018 Period	Yogyakarta, 7 - 9 May 2018	
161.	Dr. Irdika Mansur	Workshop on Acceleration of Timor Deer Breeding as Contribution of Forestry Sector in Strengthening Food Sovereignty	Jakarta, 8 May 2018	
162.	Dr. Burhanuddin Masy'ud	Workshop on Acceleration of Timor Deer Breeding as Contribution of Forestry Sector in Strengthening Food Sovereignty	Jakarta, 8 May 2018	
163.	Dr. Zulhamsyah Imran	Acceleration of SEAMEO Programs	Solo, 8 May 2018	
164.	Dr. Zulhamsyah Imran	National Seminar of Faculty of Fisheries and Marine Sciences of Universitas Satya Negara	Jakarta, 9 May 2018	
165.	Dr. Jesus C. Fernandez	Meeting on Development of Regional Potential-Based Technology to improve Economic Competitiveness in Kab. Bogor	Bogor, 14 May 2018	
166.	Dr. Irdika Mansur	Spatial Areal Planning as a Utilization of Silvopastura Regions	Jakarta, 15 May 2018	Resource Person
167.	Armaiki Yusmur, M.Si.	Comparative Study to SEAMOLEC	SEAMOLEC, 16 May 2018	
168.	Lukman Haris, S.Si.	Comparative Study to SEAMOLEC	SEAMOLEC, 16 May 2018	
169.	Haritz Cahya Nugraha, M.T.	Comparative Study to SEAMOLEC	SEAMOLEC, 16 May 2018	
170.	Andi Yudi Trisna, A.Md.	Comparative Study to SEAMOLEC	SEAMOLEC, 16 May 2018	
171.	Asep Saepudin	Comparative Study to SEAMOLEC	SEAMOLEC, 16 May 2018	
172.	Zanne Sandriati Putri, S.Si.	Comparative Study to SEAMOLEC	SEAMOLEC, 16 May 2018	
173.	Dr. Irdika Mansur	Visit and Technical Guidance to PT Ultra Sumatera Dairy Farm	Sumatera Utara, 18 - 19 May 2018	

No.	Name	Title of Activity	Venue and Date	Title of Paper Presented
174.	M. Tajudin, M.M.	Workshop on Control of MoEC Program, Activities and Budget Implementation FY 2018	Bogor, 4 - 6 June 2018	
175.	Dr. Irdika Mansur	Technical Guidance on SMK Pertanian Development Aid for Supporting Food Security 2018	Jakarta, 5 June 2018	Resource Person
176.	Bambang Sulistio, S.Si.	Technical Guidance on Budget Preparation Year 2019	Tangerang, 6 - 8 June 2018	
177.	M. Tajudin, M.M.	Technical Guidance on Budget Preparation Year 2019	Tangerang, 6 - 8 June 2018	
178.	Samsul A. Yani, S.Si.	Training on Development of Life Skills Education for Islamic Boarding School	Bogor, 28 - 30 June 2018	Resource Person
179.	Riana Hartati, S.Si.	Training on Development of Life Skills Education for Islamic Boarding School	Bogor, 28 - 30 June 2018	Resource Person
180.	Dewi Yuniati, M.Si.	Training on Development of Life Skills Education for Islamic Boarding School	Bogor, 28 - 30 June 2018	Resource Person

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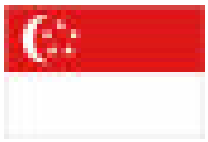

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