USAID Sustainable Higher Education Research Alliances (SHERA)
Final Report & FY2020 Annual Report

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List of Acronyms, Abbreviations, and Terms

ANBIOCORE	Animal Biotechnology and Coral Reef Fisheries
BAN-PT	National Board of Higher Education
Cal Poly	California Polytechnic State University
CCR	Center for Collaborative Research
CCR ARI	CCR for Acute Respiratory Infections
CDCS	Country Development Cooperation Strategy
CDSR	Center for Development of Sustainable Region
CLA	Collaborating, Learning, and Adapting
DEC	Development Experience Clearinghouse
DO	Development Objective
F&G	Finance and Grants
FM	Finance Manager
G&C	Grants and Contracts
GDA	Global Development Alliance
GOI	Government of Indonesia
HAKTEKNAS	National Technology Day
HEI	Higher Education Institution
ICEVT	International Conference on Electric Vehicular Technology
ICSCI	International Conference on Smart City Innovation
IIE	Institute of International Education
IIEF	Indonesia International Education Foundation
IP	Implementation Plan
IPB	Institute Pertanian Bogor
IR	Immediate Result
ITB	Institut Teknologi Bandung
J2SR	Journey to Self-Reliance
Kemenristek/BRIN	Indonesian Ministry of Research and Technology/National Research and Innovation Agency (formerly Kemristekdikti)
KPI	Key Performance Indicator
MIT	Massachusetts Institute of Technology
MIRA	MIT-Indonesia Research Alliance
MEL	Monitoring, Evaluation, and Learning
MESP	Monitoring and Evaluation Support Program
MOU	Memorandum of Understanding
MSC	Most Significant Change
MSU	Mississippi State University
NCSTT	National Center for Sustainable Transportation Technology
NOFO	Notice of Funding Opportunity
NSF	National Science Foundation
OIG	Office of the Inspector General
PIRS	Performance Indicator Reference Sheet
PLN	*Perusahaan Listrik Negara* (State Electricity Company)
PPP	Public-Private Partnerships
PSE	Private Sector Engagement
R&D	Research and Development
RIRN	*Rencana Induk Riset Nasional (*Master Research Plan)
SHERA	Sustainable Higher Education Research Alliances

SMART CITY	Scientific Modeling, Application, Research, and Training for City-centered Innovation and Technology
SOP	Standard Operating Procedure
S&T	Science and Technology
TOR	Terms of Reference
UBB	Universitas Bangka Belitung
UCB	University of Colorado, Boulder
UCD	University of Colorado, Denver
UGM	Universitas Gadjah Mada
UI	Universitas Indonesia
ULM	Universitas Lambung Mangkurat
UNDIP	Universitas Diponegoro
UNG	Universitas Negeri Gorontalo
UNPAD	Universitas Padjadjaran
UNSYIAH	Universitas Syiah Kuala
URI	University of Rhode Island
USG	United States Government
UT Austin	University of Texas at Austin
UTP	Universiti Teknologi Petronas
USAID	United States Agency for International Development

Executive Summary

The USAID-funded Sustainable Higher Education Research Alliances (SHERA) was a five-year cooperative agreement implemented by the Institute of International Education (IIE) that operated from 2016 – 2021, with the goal of "sustainable improvement in quality and quantity of science and technology research in Indonesian Higher Education Institutions."[1] The program fostered partnerships between United States and Indonesian higher education institutions (HEIs) to support the development of science and technology research. SHERA was based on three central themes: Local ownership, collaboration and engagement, and learning and oversight. Each of these themes supported SHERA achieving the following results:

534	International publications produced, 507 of which were published in the Scopus Index.
21%	Ratio of citation to publication produced by Indonesian researchers, exceeding the program's target of 11%
250	Scholars presented their research papers at international conferences, 97 of which were women
83	Partnerships established under SHERA between institutions in Indonesia and abroad
531	Number of CCR knowledge products created

To achieve SHERA's goal of improving the quality of science and technology research, a holistic and multi-stakeholder approach was employed that focused on local, Indonesian ownership. Indonesian HEIs were the primary recipients of funds and were tasked with leading activities. In many higher education projects, U.S. universities serve as the prime recipient of funding while the local, in-country universities or partners serve as subrecipients. SHERA flipped the model and placed an emphasis on local ownership where Indonesian higher education institutions were the prime recipients of funds and managed several subawards with Indonesian and U.S. HEIs. As the direct recipients of funding, the CCRs were tasked with creating partnerships with U.S. universities and scholars to conduct world-class research in critical country development fields; share knowledge between CCR universities and affiliate institutions with limited research capacity; and strengthen institutional capacity to undertake and support research. Through a competitive process, five top-tier Indonesian higher education institutions were selected to house Centers for Collaborative Research (CCRs). Each CCR focused on a different development theme.

- **Animal Biotechnology and Coral Reef Fisheries** (ANBIOCORE)- Food Security and Self-Sufficiency- Institut Pertanian Bogor (IPB)
- **CCR for Acute Respiratory Infections** (CCR ARI)- Public Health and Infectious Disease- Universitas Padjadjaran (UNPAD)
- **Center for Development of Sustainable Region** (CDSR)- Energy and Maritime Sciences- Universitas Gadjah Mada (UGM)
- **Scientific Modeling, Application, Research, and Training for City-centered Innovation and Technology** (SMART CITY)- Urban Development and Planning- Universitas Indonesia (UI)
- **National Center for Sustainable Transportation Technology** (NCSTT)- Innovative Technologies- Institut Teknologi Bandung (ITB)

[1] SHERA Goal Activity Results Framework.

The CCRs developed partnerships with 30 Indonesian HEIs and 12 U.S. HEIs serving to broaden the scope and reach of SHERA.

Another key, local partner was the Government of Indonesia, in particular, the Ministry of Research and Technology/National Research and Innovation Agency (Kemenristek/BRIN). Kemenristek was involved in the launch of the program, selecting the CCRs, supporting SHERA events, resolving challenges, and received periodic reports about the status of the program. When SHERA activities ended in the fall of 2020, Kemenristek was well-positioned to take ownership of the program and continue its support of the CCRs and their affiliates.

Indonesian public-private partnerships (PPPs) were woven into the design of SHERA. Science and technology research generated by the CCRs was applied to the development of products in PPPs that were then utilized to tackle Indonesia's development challenges. The CCRs generated 41 PPP partnerships[2] with governmental agencies, private companies, and local communities. Establishing PPPs was vital to ensuring the sustainability of the CCRs after the conclusion of SHERA.

Local ownership was one of the most important elements of SHERA and contributed to its sustainability. By the end of SHERA, each CCR had several PPPs in place, university support, and Kemenristek assistance to further develop research initiatives initially undertaken during SHERA.

Collaboration and engagement comprised another central tenant of SHERA that was woven into the design and practiced throughout the program. Partnerships were established not only between U.S. and Indonesian universities, but research and learning took place between CCRs and their affiliates. In addition, government institutions, communities, and private sector organizations engaged with the CCR's and affiliated Indonesian HEIs to serve as a conduit to apply research to development challenges.

Though it was unclear at the start of the program the degree to which Indonesian HEIs would collaborate, it is clear from SHERA events and activities that significant knowledge sharing took place among the Indonesian HEIs. Events and activities were designed to allow CCRs to provide overviews of their progress, discuss challenges, and reflect on lessons learned. Knowledge sharing was not only about the research being conducted, but also about the ongoing capacity building being undertaken by the CCRs in areas such as financial management, procurement, communications, and monitoring and evaluating indicators and results. USAID and Kemenristek support and attendance at these activities and events underscored their importance to the CCRs and facilitated knowledge sharing.

While collaboration and engagement contributed to learning, SHERA's learning and oversight approach built the capacity of the CCRs and their affiliates to comply to the terms and conditions of their subawards. Over the life of the program, IIE conducted 146 trainings and meetings that covered topics such as grant management, research protocols, reporting, monitoring and evaluation, knowledge products, connecting to national goals/needs, publicizing successes, financial management, and invoicing and paying subawardees. The distribution of funds to the CCRs and financial reporting were challenges at the start of the program. However, the program worked closely with the Indonesian HEIs, Kemenristek, and USAID to address these challenges by providing targeted training, tailored templates, and new procedures to assist with the distribution and management of funds.

The CCRs themselves conducted 45 trainings and workshops that primarily focused on improving scholars writing skills which in turn, contributed to Indonesian scholars' papers being accepted by international conferences and journals, many for the first time. One of the underlying goals of SHERA was to also increase the

[2] Full list of partnerships available in Annex III of this report.

number of women involved in research activities. Out of 1,200 training participants, over 50% of the participants were women.

A comprehensive monitoring, evaluation, and learning (MEL) plan and platform led to a continuous assessment of activities and program adjustments as necessary. The CCRs' program indicators and targets tied into SHERA's overall MEL Plan. SHERA worked closely with the CCRs in developing, managing, and reporting indicators via the MIS reporting system. Training was provided to the CCRs on using monitoring and evaluation data to measure the effectiveness of activities; identify challenges; measure progress; use to data to inform decisions; and communicate program results to USAID, Kemenristek, and other stakeholders. In addition, the CCR MEL data was used to determine the funding dispersion with the CCRs, as the CCRs had to meet pre-determined targets in order to receive additional funding. During the life of the program, the key performance indicators were adjusted to place a greater emphasis on sustainability and PPP.

SHERA's central tenants of local ownership, collaboration and engagement, and learning and oversight supported the Indonesian HEIs' research infrastructure and culture; professional development opportunities to students and faculty; international standing in science and research; linkages with multiple stakeholders including U.S. HEI, Indonesian HEI's, and public/private partners; opportunities and research capabilities of Indonesian women in science and technology; and spread research capacity to HEI's throughout Indonesia. The research generated by the CCR's, and put into action with public and private partners, targeted Indonesia's development challenges. Capturing the success is the following:

"Indonesia's stellar performance in this year's *Times Higher Education* Impact Rankings reflects the burgeoning capability of the archipelago's top institutions … Claiming three top 100 spots in any global ranking – and a handful of top 40 entries in key areas – is unheard of for Indonesia ... Japan is the only Asian country to match Indonesia's efforts in the Impact Rankings."[3]

As Kemenristek assumes ownership of SHERA, continued support is needed to ensure the CCRs remain sustainable, continue high-level development-oriented research, and learn and grow through knowledge sharing between Indonesian HEI's. Key areas of continued CCR support include the ongoing cultivation of partnerships with U.S. HEI's, developing PPP, continued capacity building particularly with funds management, and capturing and using data to drive strategic decisions.

SHERA was an innovative program that simultaneously built the capacity of the CCRs while the CCRs conducted research, submitted peer-reviewed publications, and built partnerships. While ambitious, the indicator targets illustrate the success and impact SHERA had on the CCRs. As the CCRs continue to evolve with the committed support of the GOI, the initial support they are receiving from local stakeholders at the end of SHERA is a good indicator that the CCRs will continue to be a driving force in addressing Indonesia's development challenges.

[3] John Ross, Times Higher Education, May 18, 2020.

Chapter 1: Program Overview

I. Program Goal and Objectives

The overarching goal of the USAID SHERA program was sustainable improvement in the quality and quantity of science and technology (S&T) research in Indonesian HEIs. This would elevate the research capacity of Indonesian HEIs in priority, nationally-relevant S&T topics to world-class levels. The program sought to achieve this goal through the following four objectives:

- Increased research capacity among faculty, staff, Ph.D. students, and post-doctoral scholars.
- Strengthened research capacity at targeted Indonesian higher education institutions.
- Increased access to research and professional development opportunities for women.
- Improved capacity of Indonesian higher education institutions to meet the research needs associated with Indonesia's development.

These objectives were the direct result of the integration between the Indonesian Ministry of Research, Technology, and Higher Education's 2017-2045 Master Research Plan (RIRN) and USAID/Indonesia's Country Development Cooperation Strategy (CDCS) for 2014-2018. Under the Government of Indonesia's goal to enhance the global standing of Indonesian HEIs, it called for an increase in the number of Indonesia's international scientific publications and sought to strengthen the capacity of its HEIs to produce world-class scientific research and to increase the number of Indonesian universities ranked among the world's top 500 by 2020. Under the 2014-2018 CDCS, SHERA directly contributed to Development Objective (DO) 4, "Collaborative achievement in ST&I increased" through Intermediate Result 4.1, "Academic capacity and scientific research strengthened." Following the revised CDCS in FY2019, SHERA supported DO 2, "Essential human services to targeted populations improved and sustained" through Immediate Result (IR) 2.3, "Capacity of educational institutions improved." These objectives also intersected with the National Board of Higher Education's (BAN-PT) efforts to set standards, grant accreditation, and raise the level of research at Indonesian HEIs.

At the outset of the program, IIE, USAID, and what is now Kemenristek/BRIN, jointly identified the S&T research topics of greatest importance for Indonesia's advancement. SHERA's 2016 White Paper (SHERA Baseline Assessment Preliminary Findings), which was based on extensive desktop research and interviews with Indonesian HEIs, added nuance and depth to the process. As a result, the RIRN's 13 priority S&T research topics were funneled into SHERA's five focus areas: Food Security and Self-Sufficiency; Environment, Energy and Maritime Sciences; Public Health and Infectious Disease; Urban Development and Planning; and Innovative Technologies.

II. Program Design and Results Framework

Program Design

Based on the pillars of local ownership, collaboration and engagement, and oversight and learning, SHERA established five sustainable Centers for Collaborative Research (CCRs) within top Indonesian universities, each with a distinct focus area critical to the country's development. By directing the partnership funding to Indonesian HEIs, rather than to U.S. HEI partners, and having U.S. HEIs act as subrecipients to their Indonesian counterparts, IIE took an innovative approach to the program's design. IIE knew this model would be challenging and require much more support, but it was committed to building the capacity of Indonesian HEIs to bid for, receive, and manage USG funding, furthering their ability to build future research capacity on a national scale.

In designing the CCRs, IIE worked closely with Kemristekdikti (now Kemenristek/BRIN) to develop five focus areas that were in line with its 2015-2019 Strategic Plan. Then IIE worked with Kemristekdikti and USAID to bring together an advisory board comprised of prominent higher education leaders from the U.S. and Indonesia, including members KEMRISKTEKDIKTI, USAID, the Indonesian Embassy in Washington, D.C., and the U.S.-Indonesia Joint Council on Higher Education Partnership. This board provided guidance on program design and partnership candidates.

With continued support from USAID and KEMRISTEKDIKTI, IIE began conducting targeted outreach across Java and other regions of the country in 2016, assessing the research and partnership capacity of existing HEIs and Centers of Excellence, sharing additional information about the program, and encouraging institutions to engage with potential partners in the U.S. and Indonesia. IIE then released a pre-solicitation with an expression of interest several months before the Notice of Funding Opportunity (NOFO) in October 2016 to provide potential applicants with program and eligibility details, as well as the needed time to identify the best fitting U.S. partners and Indonesian affiliates for this opportunity. Next, SHERA designed and disseminated the full NOFO, which provided a detailed outline of the priority research focus areas; expected outcomes and activities; and, an overview of the application and instructions, evaluation criteria and review process. While the NOFO was open, IIE and the Indonesia International Education Foundation (IIEF) conducted information sessions (in-person and virtually) for interested applicants to ask questions and learn more about the opportunity first-hand. Each CCR consisted of one lead Indonesian university, at least three Indonesian HEI affiliates, and at least one U.S. HEI partner. SHERA required that each Indonesian lead institution identify as a *mandiri* research cluster (as classified by the GOI), an A-tier HEI (as accredited by BAN-PT), and have a Ph.D. program in a relevant science and/or technology focus area. All Indonesian affiliate institutions were required to identify either as a *mandiri* or *utama* research cluster, and as a Tier A or B HEI. U.S. partner institutions were accredited U.S. HEIs with a Ph.D. program in a relevant science and/or technology research focus area. It was also important for CCRs to identify potential or existing partnerships with NGOs, private sector entities, government, and research institutions. After the application period closed, Indonesian and U.S.- based technical experts reviewed and rated the applications, identifying the top 17 applications across SHERA's five research focus areas. After further review and risk assessments, those applications were then narrowed down to the final five candidates in early 2017.

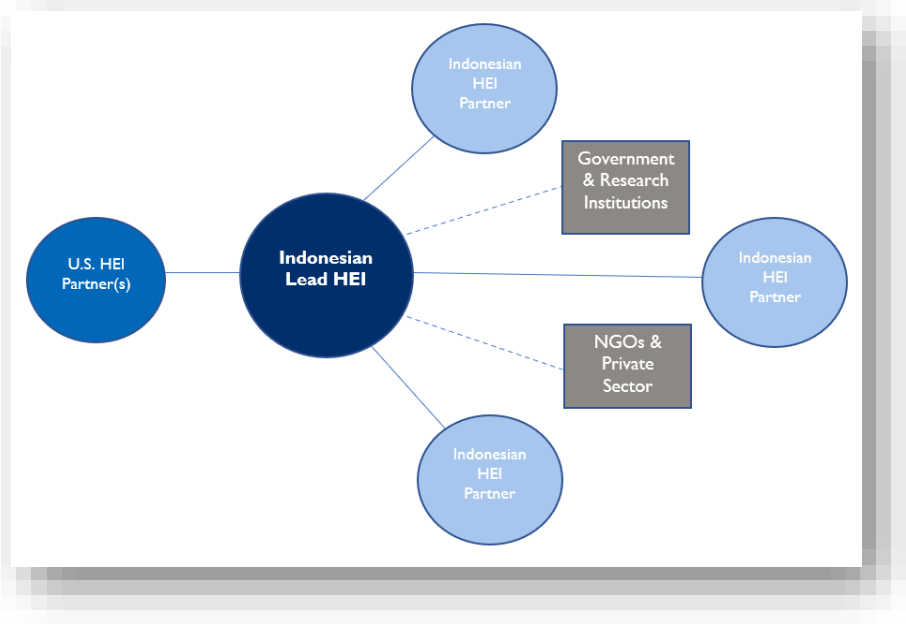

Figure 1: CCR Structure

IIE then worked with IIEF to organize a high-profile event to launch the program and celebrate the creation of the CCRs. The event was held on March 21, 2017 at Kemristekdikti's event space and was attended by high-level officials, including: U.S. Embassy Deputy Chief of Mission, Brian McFeeters; USAID Mission Director, Erin McKee; Kemristekdikti Minister, Muhammad Nasir; Rectors and Vice Rectors from each the CCR Lead; Rectors from all Indonesian affiliate partners; members of the press; and, other external stakeholders. Following formal remarks from Deputy Chief of Mission McFeeters, Minister Nasir, and other program stakeholders, IIE held a press conference and gallery walk in which the CCRs were able to showcase their prototypes and attendees were able to learn more about each CCR.

Figure 2: NCSTT Prototype Display at Launch Event

Figure 3: SHERA Launch Event, March 2017

Results Framework

SHERA's Results Framework demonstrates the logic model of SHERA activities built into achieving the program's goal – *sustainable improvement in quality and quantity of science and technology research in Indonesian higher education institutions*. To be able to measure the results at the goal, outcome and output levels, SHERA developed performance indicators at the goal, outcome, and output levels. At the Goal level, the project measured the macro-level results achieved as a result of the program's ongoing interventions. This included the high quality and quantity of scientific publications produced by Indonesian researchers, whether their publications were frequently cited by other researchers, and if the research results were being utilized to address development challenges (Goal Indicators 1-3).

For Outcome 1, the program focused on developing the quality of Indonesian researchers, in which they were able to increase their capacity related to research methods, writing and presentation skills. SHERA ensured that eligible researchers would have the same opportunities to access trainings, participate in in-person faculty exchanges held in the U.S., and receive mentoring from SHERA's U.S. university counterparts. For Outcome 2, SHERA concentrated on developing the institutional environment where inclusive policies and systems for research activities are in place, as well management systems to support the planning, implementation, reporting and results dissemination of research activities. Finally, under Outcome 3, SHERA focused on ensuring collaborations among Indonesian universities, and between Indonesian and U.S. universities, were strengthened and enhanced.

To address and measure its objective of increasing access to research and professional development opportunities for women, SHERA developed Output Indicator 2.2.4: "Number of people participated in activities addressing gender equality or female empowerment in science and technology research." It also disaggregated the data by sex where possible. In addition to these measures, SHERA examined gender as a conceptual element that supported the research environment's development and management policies by analyzing the contents of such policies to determine if gender inclusion was properly accommodated[4].

Finally, SHERA's initial M&E Plan included a total of 22 KPIs to monitor progress and manage performance at the output, outcome, and impact levels. As IIE implemented a Collaborating, Learning, and Adapting (CLA) approach to this program, IIE modified its indicators over the years to ensure all KPIs were achievable and refined to better work towards the project's goal and objectives. These changes were made in consultation with both the CCRs and USAID and reviewed on an annual basis. The Results Framework included in this report was updated by IIE and approved by USAID in August 2019 to reflect the program's end date in FY2020.

[4] Further discussion on increasing access to research and professional development opportunities for women included in Chapter 2: University Partnerships and Chapter 3: Program Achievements and Results of this report.

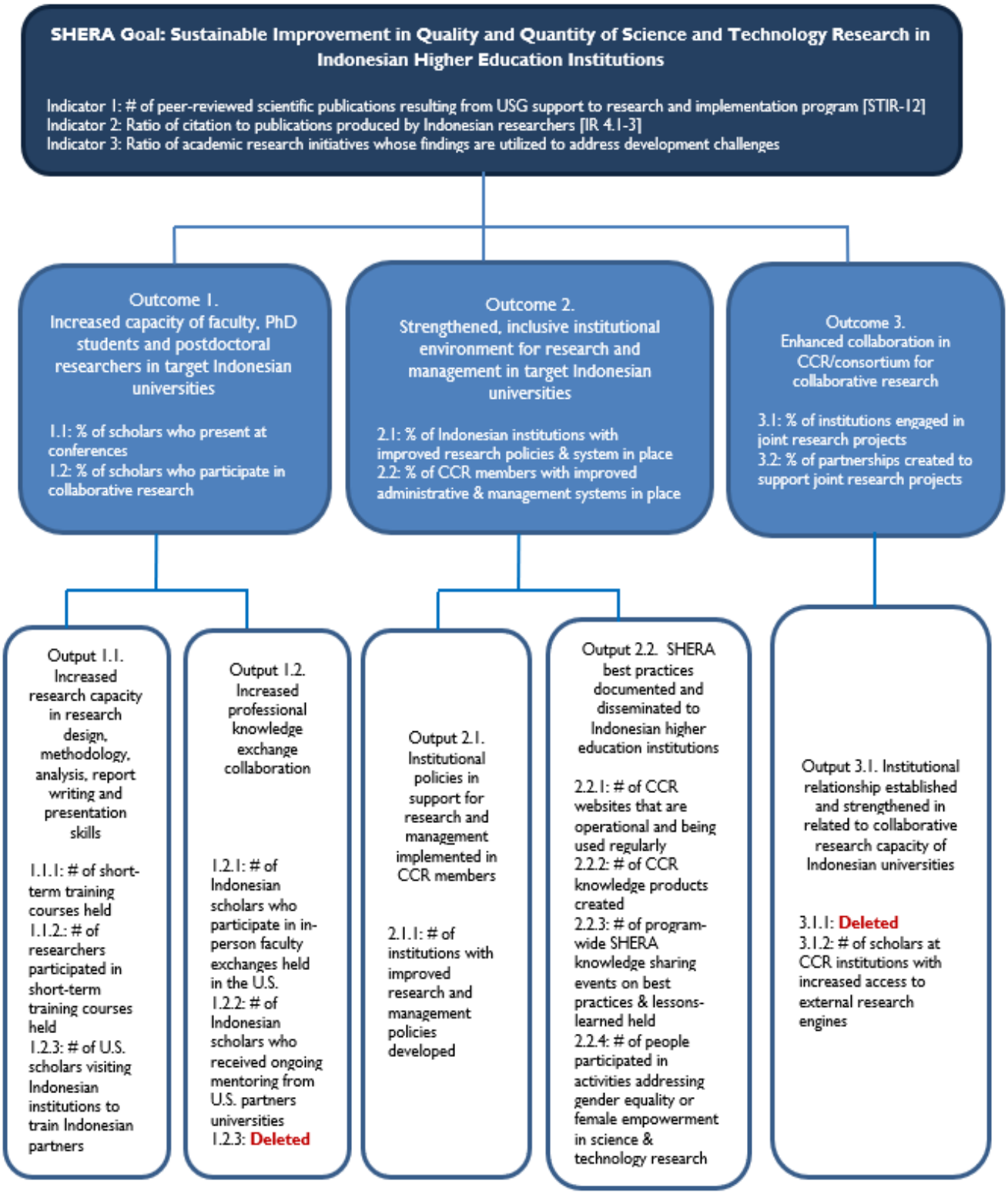

Figure 4: SHERA Results Framework, as of FY2020

Chapter 2: Program Activities

I. University Partnerships

The university partnerships that each CCR HEI Lead established formed the core of the USAID SHERA program. While the individual research objectives of each CCR were an important measure, the program focused on building the capacity of individual researchers and institutions alike. Without a supportive operating environment, high quality and high quantity research could not be conducted in a sustainable manner. Therefore, IIE and the CCR management teams collaboratively cultivated a program that emphasized continuous guidance, training, and modeling of best practices in international research and partnerships. Roughly 600 Indonesian scholars attended training programs each year, with at least 289 as active researchers on CCR projects. US scholars conducted 43 visits to the CCRs, 28 Indonesian scholars traveled to CCR partners in the US, and 81 Indonesian scholars received on-going mentoring from U.S. scholars. IIE also conducted 146 individual and group mentoring sessions with the CCRs (further information on IIE support in Section II. IIE Capacity-Building Support). All CCRs reported that the research environment at their respective institutions, lead and affiliate alike, improved.

The following section highlights the achievements of each CCR in terms of the KPIs they excelled in, as well as important structures and activities they implemented. Though the CCRs were measured across uniform program KPIs (see Annex I), each CCR had their strengths and weaknesses, as much of their success (as defined by the project's KPIs) depended on their academic field, the existing structures at each participating institution, and the nature of their research projects. Further discussion on cross-CCR performance is provided in Chapter 3: Achievements and Results. The KPI tables in the following CCRs subsections highlight the achievements and contributions each CCR made to the program. As is demonstrated below, each CCR will continue their work in different fashions, but SHERA has laid the groundwork for these successful, collaborative international research partnerships to continue well into the future.

ANBIOCORE- Institut Pertanian Bogor

CCR ANBIOCORE, which operated from October 2017 through January 2020, dedicated its research to identifying and providing solutions for sustainable food security and self-sufficiency in Indonesia. The CCR was split into two areas of focus: Livestock reproduction (creation of genomic markets to maximize reproduction) and coral reef fisheries (identification of food web components for ecosystem management). To achieve its objectives, ANBIOCORE formalized partnerships with 15 institutions, including two U.S. HEIs, eight Indonesian HEIs, and five research centers (see Annex III for full list). Highlights from ANBIOCORE's activities and partnerships are included below.

Table 1: KPIs in which CCR Ranked #1 or #2 in Comparison to All CCRs

86%	Percentage of scholars who present at a conference (1.1)
21	Number of Indonesian scholars who receive ongoing mentoring from U.S. university partners (1.2.2.)
200%	Percentage of Indonesian institutions with improved research policies and systems in place (2.1)
75%	Percentage of CCR members with improved administrative and management systems in place (2.2)
146	Number of people participated in activities addressing gender equality or female empowerment in science and technology research (2.2.4.)

Educational Pipeline

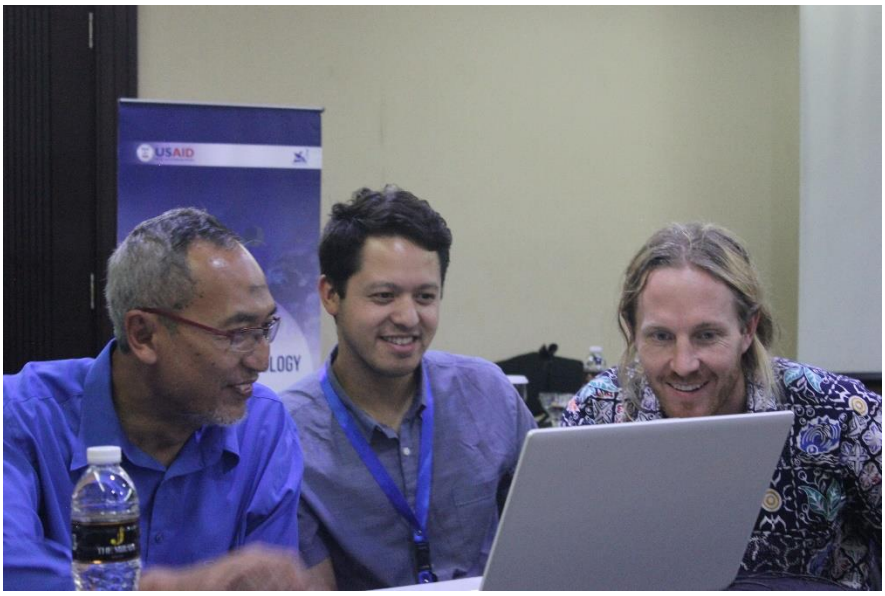

Figure 5: ANBIOCORE scholars at training with U.S. counterparts

ANBIOCORE excelled in supporting the continuing education of its affiliate member institutions and researchers. The CCR emphasized the importance of attending international conferences, seminars, and workshops. Young staff members and PhD students at the affiliate level participated in mentorship programs established by Mississippi State University and the University of Rhode Island, which focused on research proposal development and manuscript development for scientific journals. As a result, 31 ANBIOCORE scholars presented at conferences and many had their research papers accepted by publications for the very first time (see related success story in Annex V). Since ANBIOCORE's closure, the CCR has reported to IIE that this trend has continued beyond SHERA. The Partnership Manager at Universitas Syiah Kuala (UNSYIAH), for example, shared that he has published yet another Scopus-indexed article thanks to the training and support he received from ANBIOCORE.

The CCR also actively engaged the young staff members and PhD students in research planning and management and created a laboratory exchange program across Indonesia that facilitated their capacity development, both virtually and in person. Through its emphasis on collaborative educational activities, ANBIOCORE built a pipeline of trained scientific talent in emerging Indonesian universities that can be utilized by higher education, the private sector, and the government alike in the years to come.

Gender Inclusivity

Figure 6: Panelist Prof. Cissy, Director of CCR ARI, sharing her experience at the 'Women in Research and Innovation' talk show in 2019

Women's role and engagement in research was also highlighted by ANBIOCORE. Women researchers composed more than 50% of ANBIOCORE's total researchers. As the CCR Lead, IPB made a strong commitment to providing women with research opportunities and all its affiliates agreed to do the same. The CCR opened opportunities for women to submit research proposals, compete equally with other researchers, and broaden their networks. To highlight the important role that women play in research, technology, and development, ANBIOCORE hosted the talk show, 'Women in Research and Innovation,' in December 2019. Five Indonesian women shared their stories of conducting research as a woman with an audience of 80 attendees, comprised of IPB students and lecturers, representatives

from each ANBIOCORE affiliate, and the public. Concluding the talk show, ANBIOCORE signed the 'Bogor Declaration for Women Researchers 2019.' With this declaration, the first of its kind at IPB, 12 Indonesian institutions committed to collaborate and involve women's participation in research and innovation activities.

Collaboration and Engagement with Government Research

ANBIOCORE's livestock reproduction research cluster successfully established and cultivated productive partnerships between government research institutions and universities across Indonesia. Beginning in 2018, ANBIOCORE worked with researchers at government artificial insemination centers, such as the one in Baturiti Bali, to both share and collect data for research on bull fertility. This data was then used to analyze the semen quality of Bali bulls and investigate the correlation between sperm quality and fertility in the artificial insemination of the bulls.

Figure 7: ANBIOCORE bull fertility researchers

This type of partnership expanded beyond data collection and became reciprocal in nature. ANBIOCORE gained access to key data for its research, but it also provided government researchers opportunities to conduct research in the field with its CCR researchers. For example, Universitas Brawijaya established a relationship with Balai Besar Inseminasi Buatan Singosari where BBIB Singosari researchers directly participated in the research process and became co-authors on two publications (see related success story in Annex V). The government researchers also participated in ANBIOCORE's capacity-building workshops. This provided added value for the government while also supporting the goals of ANBIOCORE and its researchers.

Sustainability

Due to the program's limitation of funding, ANBIOCORE was forced to cease program activities, close its subagreement with IIE in January 2020, and abruptly shift to implementing a sustainability plan. Accordingly, ANBIOCORE is still in a transitional period. The CCR is continuing to develop its research activities and partnerships but will likely split into separate research centers (livestock reproduction and coral reef fisheries) in order to better focus on each. As of this report, ANBIOCORE has identified possible sources of funding and partners to extend its research activities (BUSKIPM, USAID SEA, WCS, BIBD Baturiti, and BPTU HPT Pulukan). Though the future form of ANBIOCORE has yet to be determined, the groundwork has been laid at the institutional and scholar level for important research and international collaboration on food security to continue well beyond SHERA.

CCR ARI- Padjadjaran University

CCR ARI, which operated from June 2017 through January 2020, was designed to tackle public health issues in Indonesia, including fighting respiratory infections through epidemiological and clinical studies for vaccine development and policy. To achieve this objective, CCR ARI formalized partnerships with 18 institutions, including one U.S. HEI, four Indonesian HEIs, twelve hospitals, and one private sector partner (see Annex III for full list). Highlights from CCR ARI's activities and partnerships are included below.

Table 2: KPIs in which CCR Ranked #1 or #2 Compared to All CCRs

14	Number of short-term training courses held (1.1.1.)
9	Number of U.S. scholars visiting Indonesian institutions to lead short-term training courses for Indonesian partner institutions (1.1.3.)
8	Number of Indonesian scholars who participate in in-person faculty exchanges held in the U.S. (1.2.1)
57%	Percentage of Indonesian institutions with improved research policies and systems in place (2.1)
186%	Percentage of institutions engaged in joint research projects (3.1)

Human Capital Improvement

At the onset of the project, CCR ARI anticipated that the program would be challenging to implement due to the gaps between Indonesian universities and US universities, as well as gaps in understanding and practice within Indonesian HEIs and the resources provided by the government. CCR ARI understood that these disparities were further heightened by geography, with non-Java and eastern Indonesian institutions having fewer resources and institutional knowledge to manage international partnerships and conduct quality research. Accordingly, CCR ARI designed its program to first reshape and strengthen the culture related to research in Indonesian higher education before fully delving into its research activities.

Figure 8: CCR ARI Director Dr. Cissy leading medical check with CCR researcher

CCR ARI implemented a robust training program based on the context of clinical and public health-related research across all affiliate institutions, in both hospital and academic settings. The CCR incorporated high-quality epidemiologic and clinical trials to establish a training environment for faculty, PhD, and postdoctoral students, developing the research capacity of all participating Indonesian affiliates. US affiliate faculty members directly mentored five Indonesian first-level faculty members on conducting sound epidemiologic and clinical research, and those Indonesian faculty members were then able to pass along their knowledge to their departments. To support this cascading mentorship model, CCR ARI also established a Massive Open Online Courses on epidemiology. CCR ARI also implemented a training course on epidemiology, biostatistics, database management, manuscript preparation, English for scientific use, and grant writing for its affiliates. By building the capacity of its researchers to conduct high-quality research and training, CCR ARI instituted a model that promotes the human capital improvement of its researchers beyond the lifecycle of the SHERA program.

Institutional Growth

In order to improve the higher education research environment in Indonesia, CCR ARI understood that building the capacity of individual researchers and faculty members needed to be accompanied by simultaneous change at the institutional level. Therefore, it made a point to initiate policy changes on a variety of fronts. In April 2018, it conducted an event called "The Role of Women in Medicine and Education," which highlighted scientific research findings from medical women researchers. This event then led to all CCR ARI university partners to sign a gender mainstreaming declaration called *Deklarasi Bandung untuk Wanita 2018*, or Bandung Declaration for Women 2018. CCR ARI also helped establish an Ethical Committee for research review at the affiliate level, the first of their kind for many of the affiliates and trained them on ethical concerns surrounding research that involves human subjects. Institutional capacity building also extended to hospitals, such as when UNSYIAH and RSUD Zainoel Abidin conducted a Good Clinical Practices training for the researchers involved in the Burden of Disease Study (see related success story in Annex V). Universitas Lambung Mangkurat (ULM) even conducted a Medical Writing Workshop to improve researchers' capacity in writing international papers. Finally, in an effort to further establish international partnerships with US universities, CCR ARI developed a faculty exchange program and sent delegations to visit University of Colorado, Denver (UCD) and Colorado State University in April 2019. As a result, four Memorandums of Understanding (MOUs) were signed to continue further collaborative research plans.

Sustainability

Like ANBIOCORE, CCR ARI ceased program activities and closed its subagreement with IIE in January 2020 due to the program's funding limitation. Despite the CCR's closure, its researchers and partner institutions are continuing its legacy by moving forward with its five-location epidemiological research project, having secured internal funding from UNPAD. Agreements have been made to continue the CCR's work on the following research topics: Indonesian Eclampsia and Pre-eclampsia Registry; Genetic association between the PKF 13 gene mutation and the artemisinin resistance phenotype in plasmodium falciparum isolates from Indonesia; molecular profiling of neonatal sepsis using saliva with Fourier transformation infrared spectroscopy; and, control of hypertension as a risk factor of stroke by building a monitoring system using mobile phone application in Ambon City, Indonesia.

Figure 9: CCR ARI lab facility

CCR ARI, through UNPAD, has also been actively involved in mitigating the spread of COVID-19 in Bandung and West Java. CCR ARI provided its domain and server, including the Research Electronic Data Capture platform, for UNPAD to publish an application called AMARI-COVID-19 (*Aplikasi MAwas diRI* COVID-19). This online application, which is a joint collaboration between the Department of Public Health and the Faculty of Medicine provides the public with education on COVID-19, in addition to initial identification of the virus (though not diagnostic). Based on the patient information entered (i.e. potential exposure to the virus), the application directs the user to the appropriate government services. As this activity demonstrates, CCR ARI, regardless of its future form, will continue to have a positive impact on Indonesia's public health in the years to come.

CDSR- Universitas Gadjah Mada

CDSR, which operated from July 2017 through June 2020, focused its research on implementing an energy efficient, hybrid energy system and supporting network to transform Indonesian into a sustainable, tropical archipelago. Rather than see itself as an environment, energy, and maritime sciences project with a set duration, CDSR instead envisioned the USAID SHERA program as a seed grant that would create a sustainable, international hub which blended research and development (R&D), as well as community activities, through an interdisciplinary framework. CDSR achieved just that. It systematically built, enlarged, and strengthened its network by adding institutional partners across Indonesia, the U.S., and other countries. Under SHERA, CDSR formalized partnerships with 19 institutions, including three U.S. HEIs, seven Indonesian HEIs, and nine government and private sector partners (see Annex III for full list). Highlights from CDSR's activities and partnerships are included below.

Table 3: KPIs in which CCR Ranked #1 or #2 Compared to All CCRs

34%	Ratio of citation to publication produced by Indonesian researchers. 20 of the 32 publications cited were peer-reviewed journal articles (Goal 2)
3%	Ratio of academic research initiatives whose findings are utilized to address development challenges (Goal 3)
53%	Percentage of researchers participating in short-term training courses (1.1.2.)
73%	Percentage of scholars who participated in collaborative research (1.2)
10	Number of Indonesian scholars who participated in in-person faculty exchanges held in the U.S (1.2.1)
111%	Percentage of institutions engaged in joint research projects (3.1)

Adaptive Management and Cross-Institutional Synergy

CDSR designed its program to create a transdisciplinary international center that built strong R&D institutions through collaboration and capacity building. It systemically built, enlarged, and strengthened a network of institutional partners across Indonesia, the U.S., and other countries. Without institutional support mechanisms in place, CDSR understood that an enabling environment for high-quality research would not be possible. Therefore, it established rules in its subagreements with affiliates that encouraged them to optimize the capability of their existing network. Each network and partnership that was developed had to be managed in accordance with CDSR rules on good governance and finance principles, and strict budgetary rules and workflows were implemented so funds were properly spent. In order to establish a collaborative working environment while following the necessary policies, CDSR created an environment of intensive communication that blended informal and formal styles and encouraged a trust-based culture.

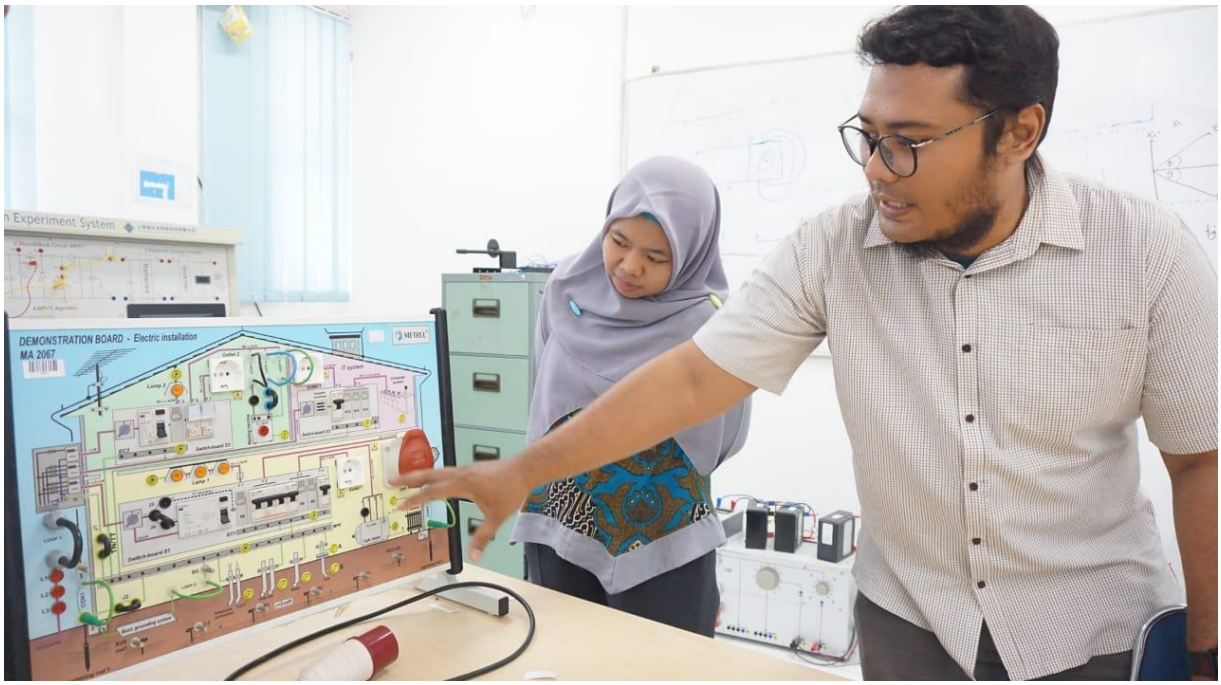

Figure 10: CDSR researchers demonstrating electric installation of energy panels

As a result of this adaptive management approach, CDSR's interdisciplinary partnerships with affiliates, the private sector, and government partners flourished. Thirty of its institutions engaged in joint research projects and 73% of its scholars also participated in collaborative research. During research and training activities on biorefineries, green building, and other renewable energy and sustainability topics, researchers met and discussed with others from diverse backgrounds, which resulted in innovative ideas that solved complex problems. 93 peer-reviewed scientific publications were produced, and 34% of those publications were cited, the highest ratio of any CCR. Successful partnership examples include but are not limited to the following:

- **Gorontalo Province Network-** Developed an expansive partnership between local government partners and researchers in Gorontalo Province. There, CDSR helped Universitas Negeri Gorontalo (UNG) establish a center for energy studies that led to R&D collaboration with the Government of Gorontalo to help mitigate water-food-energy challenges related to Limboto Lake. The partnership is now expanding its collaborative programs in education, R&D, and community service with financial support from the GOI. It continues to work to preserve Limboto Lake through the creation of a geopark. If a geopark is established, it would serve as a protected area that would conserve the heritage of the area and promote responsible ecotourism.

- **Bangka Belitung Network**- Established a collaborative partnership between local government, researchers, and the private sector in Bangka Belitung Province. Under CDSR affiliate Universitas Bangka Belitung (UBB), researchers from the faculty of economics, law, and agriculture came together to support research activities and capacity building. UBB successfully expanded the interdisciplinary network to include Perusahaan Listrik Negara (PLN), a state electricity company. As a result of its success, the Ministry of Research, Technology, and Higher Education increased UBB's institutional accreditation level and research category. The university now serves as a hub for enlarging the supply chain of microalgae-based biorefineries in Indonesia and works with the provincial and local governments, state-owned enterprises, and vocational schools.

- **Sustainability Analysis Replication**- Designed and conducted an energy systems sustainability analysis called "Developing Matrix of Women Role in Sustainability Design" that incorporated the role

and impact of women on sustainable energy systems development. The research was presented at the United Nations Development Programme's Small Grant Project exhibition in 2018, then the UN adopted the model. Through the Small Grant Project, it replicated the research methodology and approach and expanded it into in four areas across three provinces in Indonesia: Semau Island, Gorontalo, Nusa Penida and Wakatobi. CDSR's lead researcher was also appointed as the project's program manager (see further details under Annex V: Success Stories). This approach to conducting sustainability analyses has also been implemented in the Development of Maluku and Papua Electrical Masterplan. From June 2019 through June 2020, UGM's Faculty of Engineering was funded by PLN to produce recommendations for its strategic plan of electricity system development in those areas. Through the replication of its sustainability analysis, CDSR was one of two CCRs whose findings from an academic research initiative were utilized to address development challenges (Goal 3).

U.S.-Indonesia HEI Collaboration

In its partnership with the University of Colorado, Boulder (UCB), CDSR developed a reciprocal relationship with the U.S. HEI that went beyond capacity building support. UCB took an active role in the CCR from the proposal phase onwards and both assisted CDSR in executing the program and explored opportunities for research collaboration. It also hosted ten CDSR scholars at its campus in the U.S. for training and research paper collaboration, the most of any CCR. Had the SHERA program not been truncated (see further information under the Challenges section), many more scholar exchanges between the two institutions would have occurred. Despite SHERA's early end date, CDSR's partnership with UCB is only expanding. Beginning in July 2020, a joint team comprised of researchers from UCB, UGM, and ITB will run a one-year green/smart city project in Makassar, South Sulawesi Province. This project is funded by the U.S. National Science Foundation (NSF). Further information is provided below under the Sustainability section.

CDSR's focus on sustainable renewable energy is highly relevant to both the U.S. and Indonesia. Through U.S. – Indonesia cooperation, there is also an opportunity to develop commercial, transdisciplinary programs. After establishing a strong foundation with its U.S. and Indonesian affiliates in the beginning of the program, CDSR then began to expand its network in the U.S. In April 2019, CDSR conducted a trip to the U.S. explore new collaborative partnerships utilizing its existing network of U.S. colleagues. The CCR met with representatives from Colorado State University, the University of Texas at Austin (UT Austin), Auburn University, California Polytechnic State University (Cal Poly), and the University of California at Davis. As a result of that trip, CDSR, through UGM, signed MOUs with UT Austin and Cal Poly in February 2020. These two MoUs establish an important path forward to enlarge CDSR's network in the U.S. beyond the SHERA program.

Figure 11: Dr. Nissa, CDSR scholar, at visit to UC Boulder

Sustainability
Program sustainability beyond the SHERA was a key feature of CDSR's design and activities from the beginning of the program. As summarized below, CDSR secured funding to continue its work. These are the important first steps towards supporting itself in the future. As noted by UGM in its final report to IIE, the CCR's ultimate goal is to continue its cross-institutional research collaboration, as it greatly values the "mutual trust [that has been developed] among the lead and affiliates as well as related supporting stakeholders"

- **Kemenristek Funding**- In March 2020, Kemenristek announced that it had selected three out of five CDSR proposals for continued research funding, totaling $50,000 USD over a three-year period. This funding support will continue the CCR's research on the development of the microalgae park in Semujur Island, the supply chain of a photovoltaic system, and the development of an inverter production unit for photovoltaic systems. Furthermore, this external funding will allow UGM to continue leading the research initiative in collaboration with UBB and IPB. CDSR also sees this work as an opportunity to develop synergy between the U.S. and Indonesia synergy on production and marketing. This achievement both highlights CDSR's commitment to research that empowers local communities in Indonesia, as well as the GOI's commitment to supporting research initiatives beyond USAID support.

- **Gorontalo Government Support-** In March 2020, CDSR affiliates also signed an agreement with the local government of Gorontalo Province. This agreement will support research collaboration on renewal energy between the local government of Gorontalo Province, the district government of Bone Bolango, Universitas Muhammadiyah Gorontalo, Universitas Gorontalo and Universitas Negeri Gorontalo. Due to the success of CDSR's partnerships, local government entities wish to replicate those successes on a local scale by involving the above universities and UGM.

- **National Science Foundation and U.S. Department of State Project**- Through its U.S. HEI affiliate UCB, CDSR received $175,000 USD in funding from the NSF to support a one-year research project entitled, "Modernizing Cities via Smart Garden Alleys with Application in Makassar City." This project, which began in July 2020, was designed in response to the NSF Dear Colleague Letter: Supporting Transition of Research into Cities through the U.S. ASEAN (Association of Southeast Asian Nations Cities) Smart Cities Partnership, in collaboration with the U.S. Department of State. It "seeks to integrate innovations in smart and connected communities with creative gardens within the city alleys of Makassar City, Indonesia via a synergistic collaboration between U.S. and Indonesian teams and a close partnership with Makassar City."[5] More specifically, the research aims to "…catalyze the transformation of Makassar City's garden alleys into smart environments by deploying a sensor network at representative green allies and conventional allies to collect data related to air quality, microclimates, and other factors, to analyze the heterogeneous data using machine learning techniques, and to then share the data and its insights with city representatives and specific communities."[6] Further information on the award and research can be found here on the NSF's award page.

NCSTT- Institut Teknologi Bandung

NCSTT, which operated from September 2017 through July 2020, targeted research on developing sustainable transportation. It specifically worked on electric vehicle battery development, rolling stock, infrastructure issues, and transit-oriented development through eight research clusters. Under SHERA, NCSTT formalized partnerships with 14 institutions, including two U.S. HEIs, six Indonesian HEIs, and six government and private

[5] Faulkner, C. (2020, July 17). Modernizing Cities via Smart Garden Alleys with Application in Makassar City. Retrieved from https://www.colorado.edu/lab/sbs/smart-garden-alleys
[6] Ibid

sector partners (see Annex III for full list). Highlights from NCSTT's activities and partnerships are included below.

Table 4: KPIs in which CCR Ranked #1 or #2 Compared to All CCRs

174	Number of peer-reviewed scientific publications resulting from USG support to research and implementation program. 100% indexed in Scopus (Goal 1)
230	Number of CCR knowledge products created (2.2.2.)
18	Number of CCR knowledge sharing events held on best-practices & lessons learned (2.2.3.)
243%	Percentage of Partnerships Created to Support Joint Research Projects (3.2)

International Research Partnerships

NCSTT prioritized building international research partnerships between its researchers and institutions in Indonesia, U.S. and other countries, as the CCR understood that such relationships are vital to developing and maintaining cutting-edge research and securing external funding. NCSTT was able to jumpstart its activities in this regard from the start of its subagreement with IIE due to its strong network and management scaffolding. During its first quarter of operation under SHERA (FY18 Q1), it was able to host the International Conference on Electric Vehicular Technology (ICEVT). This conference, which became an annual event that NCSTT conducted, brought together researchers from around the world to discuss electric vehicle development. This event also became a prime opportunity for NCSTT researchers to connect with international researchers in their field and present their research, many for the first time, and directly contributed to NCSTT's high level of peer-reviewed publications and knowledge products.

Figure 12: NCSTT and GOI delegation visit to MIT in May 2019

NCSTT also developed a close working relationship with its U.S. affiliate, the Massachusetts Institute of Technology (MIT). In January 2018, NCSTT leadership first traveled to Massachusetts to initiate the SHERA research partnership and academic exchange program. This was then followed by another visit in May 2018, as a NCSTT representative accompanied the Indonesian Minister of Research, Technology, and Higher Education to MIT and there the relationship between ITB and MIT was formalized, with key support from the Ministry. This early attention to the formation of the partnership helped to grow the relationship over the next several years. Moreover, by involving high-level university officials at both institutions, as well as the Ministry, the partnership received critical buy-in from all levels that helped facilitate program activities and solve challenges. As a result, MIT researchers frequently collaborated with Indonesian researchers on activities and led numerous workshops and seminars on a variety of topics, ranging from technical research expertise to research best practices to how to build multidisciplinary research centers.

Due to the success of its partnership with MIT under SHERA, NCSTT was selected to manage MIT's collaboration program with thirteen Indonesian universities, beginning in 2021. Through this program, which is conducted in close coordination with the Ministry of Research and Technology, the Ministry of Education and Culture, and the Indonesia Endowment Fund for Education, NCSTT will work with MIT to tackle Indonesia's most pressing development problems over the next five years.

Finally, NCSTT was also successful in forming strong international relationships with other universities outside the U.S. In the U.K., NCSTT collaborated with the University of Oxford to conduct a workshop (2017) on the transportation industry, and later NCSTT secured funding from the Royal Academic of Engineering to develop an online platform on electric vehicles. Regional partnerships were also created. In May 2018, NCSTT attended a consortium meeting with Beijing Jiaotong University to discuss collaboration on Indonesia's high-speed railway project. NCSTT researchers had the opportunity to observe China's Academy of Railway Sciences' test track for the 3-km rail, and Beijing-Tianjin high-speed train with the speed of 300 km/h, which broadened the researchers' knowledge on high-speed-railway technology and strengthened the CCRs' connection with other international universities working on sustainable transportation issues. In Japan, NCSTT initiated collaboration with the Tokyo Institute of Technology on transport modeling and demand projections, big data analysis on passenger behavior, transport mapping, transport safety and crash avoidance, and infrastructure development. This research involved six laboratories and one (Inaba Laboratory) accepted several undergraduate and graduate students from NCSTT to conduct research. Lastly, NCSTT also formed a productive partnership with Universiti Teknologi Petronas (UTP) in Malaysia due to a connection between the two faculty members at those institutions. The research partnership has focused on developing range extender technology for electric vehicles and assessing the factors that influences electric vehicle acceptance in Indonesia and has secured funding to continue beyond SHERA.

Industry and Government Engagement

Similar to NCSTT's emphasis on international university partnerships in its programming, it also prioritized collaboration with the private sector and the government for two primary reasons. First, transportation technology is intrinsically linked with the private and public sectors. Second, the R&D process takes years to develop, and even more so with new partnerships. Therefore, it was crucial that NCSTT build upon its existing networks within these two sectors to build effective programming and secure buy-in and funding beyond the SHERA program.

Figure 13: NCSTT researcher in the laboratory

At the start of its award, NCSTT organized the ITB CEO NET & Technopreneurship Festival in October 2017, which aimed to strengthen collaboration between higher education and industries and to support research-based industrial innovation. This event was continued in 2018 and included key players from business and governmental institutions to discuss national issues and view NCSTT's start-up exhibition, which aimed to attract investors for transportation-related start-ups. NCSTT was successful in establishing private sector relationships. In 2018, NCSTT developed a partnership with Bakrie & Brothers, an Indonesian corporation focused on trading, construction, agribusiness, the energy sector, and telecommunications. Through this partnership, the CCR is working with the company to develop a commercialized electric-based transportation system. NCSTT is also collaborating with the Japanese auto

manufacturer Isuzu to discuss the prototyping process with its electric bus researchers and to develop electric buses and minibuses, to potentially be utilized by transportation companies in Indonesia. Lastly, NCSTT has created a partnership with the Japan Railway East Corporation (JR East) and Tokyo Institute of Technology to support NCSTT in developing curriculum on railway technology.

These private sector partnerships have gone hand-in-hand with NCSTT's public sector collaboration. For example, in November 2017, ITB formally established a five-year partnership with the Ministry of Transportation and the Jakarta Mass Rapid Transit Corporation (PT Trans Jakarta) to focus on research development and collaboration between academia, the private sector, and the public sector. Each of NCSTT's partnerships are in different stages, some formalized while others are still being formulated, but the necessary linkages are in place for the NCSTT's important work on sustainable transportation to continue beyond the SHERA program.

Sustainability

Due to NCSTT's emphasis on building partnerships with international universities, the Government of Indonesia, and the private sector, it was well-prepared to sustainably transition from the SHERA program to independently continuing its work with external funding. Below is a list of planned activities, as of the time of this report:

- **University Teknologi Petronas Partnership-** The UTP-NCSTT partnership has secured funding from UTP and ITB to continue its research on electric vehicle range extenders and electric vehicle market research. The project, which runs from March 2020 through December 2022, includes both research activities, as well as a student exchange component, and will produce important academic papers, workshops, and student exchange programs.

- **Electric Vehicle Online Learning Platform**- NCSTT applied for and secured funding from the U.K. Royal Academy of Engineering to develop an online learning platform on electric vehicles which will be utilized by students, industry, and governments alike. The two-year project commenced in June 2020.

- **Automobile Industry Collaboration-** In coordination with leaders from Indonesia's automobile industry, NCSTT is continuing a research project that will formulate strategies to support electric vehicle development and infrastructure in Indonesia. This includes analyzing the market players, government policies, electricity grid capacity, key stakeholders, and the number of charging stations and their locations in Indonesia. This research will then be developed into policies that will promote higher electric vehicle market share in Indonesia.

- **MIT-Indonesia Research Alliance (MIRA)-** NCSTT was assigned by the Ministry of Research and Technology to manage the five-year MIRA program between MIT and thirteen Indonesian universities, beginning in January 2021. MIRA's research will focus on energy, health and food technology, sustainable transportation, supply chain technology, nanotechnology, and disaster mitigation, among other topics vital to Indonesia's sustained development.

- **Government Partnerships-** The Ministry of Transportation has tapped NCSTT to assist the government in managing the transportation system in Indonesia during the COVID-19 pandemic. Specifically, NCSTT is examining the effectiveness of government policies in reducing the virus' spread, creating policies to assist public transportation companies in recovering financially, and formulating policies to improve the logistics of heavy transportation to support the Indonesian economy during the pandemic. NCSTT is also working with the Ministry of Transportation to help design the transportation system for the new capital city of East Kalimantan. NCSTT will help design an autonomous electric vehicle system and design the public transportation system for a Bali North-South Line. This collaboration is just the start of NCSTT's collaboration with the Indonesian government in the years to come.

SMART CITY-Universitas Indonesia

SMART CITY, which operated from July 2017 through June 2020, conducted collaborative research on issues of infrastructure, information and communications technology and mobility, and quality of life. Under SHERA, SMART CITY formalized partnerships with 20 institutions, including four U.S. HEIs, eight Indonesian HEIs, and eight government and private sector partners (see Annex III for full list). In terms of Key Performance Indicator (KPI) achievements, SMART CITY led the CCRs by ranking #1 on eight KPIs across all three outcomes. Highlights from SMART CITY's activities and partnerships are included below.

Table 5: KPIs in which CCR Ranked #1 Compared to All CCRs

237	Number of peer-reviewed scientific publications resulting from USG support to research and implementation program. 100% indexed in Scopus (Goal 1)
5%	Ratio of academic research initiatives whose findings are utilized to address development challenges (Goal 3)
20	Number of U.S. scholars visiting Indonesian institutions to lead short-term training courses for Indonesian partner institutions (1.1.3.)
132%	Percentage of scholars who participate in collaborative research (1.2)
34	Number of Indonesian scholars who receive ongoing mentoring from U.S. university partners (1.2.2.)
6	Number of institutions that develop improved research and management policies developed (2.1.1.)
194	Number of people participated in activities addressing gender equality or female empowerment in science and technology research (2.2.4.)
260%	Percentage of Partnerships Created to Support Joint Research Projects (3.2)

Research Dissemination

SMART CITY led the CCRs in research publication and broadly disseminating its work. As seen in the chart above, it produced 237 peer-reviewed scientific publications, all Scopus-indexed, far exceeding its program target of 180 peer-reviewed publications. This was achieved through strategic planning and key support mechanisms for its scholars. Namely, the CCR provided funds for attending international conferences, provided incentives for each manuscript that became a Scopus-indexed publication, established a fellowship program, and gave research cluster assistance to it Indonesian HEI partners. In addition to producing a high number of publications, the CCR also had a 27% citation rate due to CCR's emphasis on researching cross-cutting issues.

SMART CITY's publication success was also due to continuous capacity-building training. Between 2017-2019, SMART CITY provided capacity-building training for 209 scholars (graduate level and higher) and 40 other participants through two academic writing short courses and two research design/method short courses. Scholars from each Indonesian affiliate were invited to discuss their research proposals during the research design short course, and they drafted their scientific papers during the academic writing short course. Furthermore, they were paired with U.S. scholars in similar fields through lectures and group mentoring sessions to gain additional insight on their work and papers. SMART CITY strategically planned the timing of the research design courses to coincide with GOI funding cycles so they could help mentees prepare for the annual

call for research proposals in April. Then, the academic writing short courses were conducted in November to coincided with the opening of publication submission periods. SMART CITY reported that this approach increased participants' engagement and willingness to attend the workshops, which contributed to the success in collaborative research, publication, and dissemination.

Figure 14: Annual ICSCI Conference, 2019

Furthermore, SMART CITY used international conferences as a platform to boost scholar participation at the international level, produce conference proceedings, and build the institutional capacity of their Indonesian HEI subrecipients. The CCR conducted the International Conference on Smart City Innovation (ICSCI) in 2018, 2019, and again in 2020 after it closed its SHERA subagreement. The 2018 and 2019 conferences alone generated 120 paper in Scopus-indexed proceedings. Each year, SMART CITY had one of its Indonesian affiliates lead and organize the conference, with UNPAD hosting in 2018 and Universitas Diponegoro (UNDIP) hosting in 2019. By having CCR affiliates lead the conference as part of their subagreements, SMART CITY was able to enhance the institutions' research management capacity, elevate their status on an international level, and connect them with scientific publishers. For the third annual ICSCI in 2020, which was largely a virtual event due to COVID-19, SMART CITY was able to partner the event with three other conferences: the AUN/Seed-Net Regional Conference on Energy Engineering, UI's Dwell conference, and LASER PULSE's R4D short course.

Public-Private Partnerships

SMART CITY was also very successful in establishing public-private partnerships. SMART CITY utilized its network at the start of the program to develop activities that utilized existing partnerships and created new connections. As a result, it was only one of two CCRs (the other being CDSR) to make progress towards Goal 3, the ratio of academic research initiatives whose findings are utilized to address development challenges. One of SMART CITY's research groups, led by Prof. Dr. Ir. Anne Zulfia, MSc. from the Department of Metallurgy and Material Engineering, and Ir. Chairul Hudaya, ST, M.Eng., Ph.D., IPM from Department of Electrical Engineering, worked with the companies PT Pertamina and PT. Wijaya Karya to develop TaLis (Tabung Listrik), a portable electrical battery capable of lighting low-rise buildings in rural areas. This battery brought electricity to housing and small community facilities in areas the government's electrical company could not reach. In 2018, it was implemented in Maluku, Papua, and Indonesia Master School in Depok in 2018. In addition to this achievement, its research partnerships with the government and private sector resulted in in-kind contributions of over $35,000 USD. Two program activities exemplify this success. Further information on each is provided below:

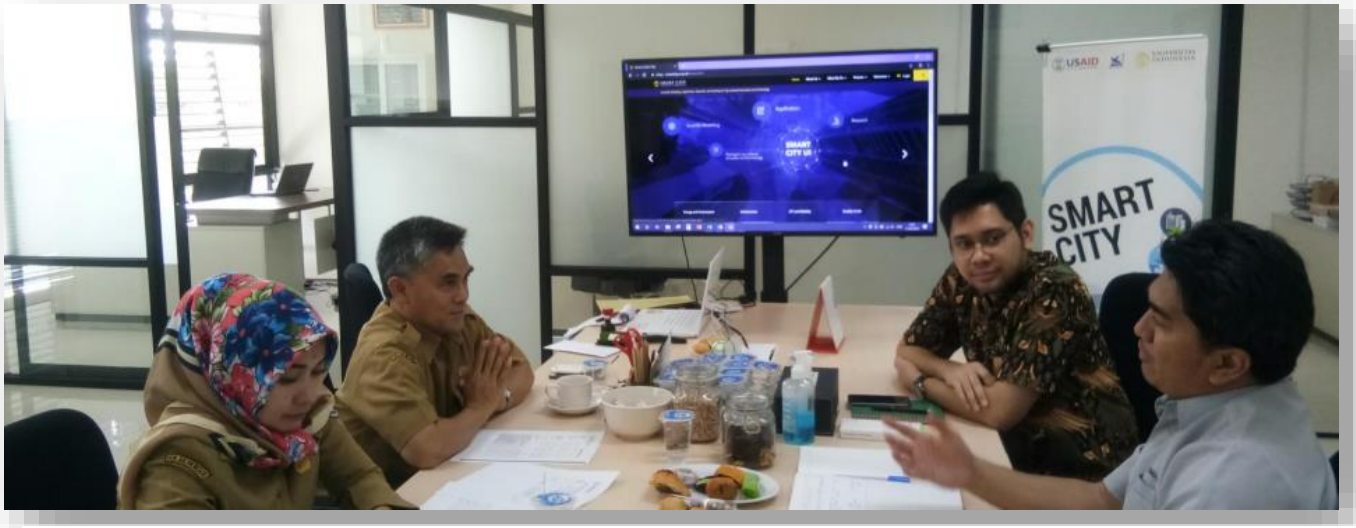

Figure 15: SMART CITY's May 2019 consultation with the Tangerang City Agency for Regional Planning and Development on the city's masterplan and economic governance

- **Adaptive Management System and Smart Surveillance System** - The CCR's Situation Room research cluster created an adaptive management system and smart surveillance system in partnership with three government entities and one private company. In 2017, the CCR began developing the concept of a land-control system with government entities and interviewed three cities in Java to identify their needs. By 2019, it had developed a framework for a 3-dimensional monitoring system, with the prototype then created in 2020. The surveillance system can estimate the value of land and buildings and its output is then synchronized with construction permits to identify any tax violation and mass or land appraisal. Its Adaptive Management System also serves as a solution to congestion problems in Indonesia, as it adjusts traffic lights in a region based on real-time traffic conditions. In the activity, the Agency for Regional Planning and Development at Depok City Government worked with the CCR in creating prototypes of the Adaptive Management System and Smart Surveillance System designed by the SMART CITY's scholars to be adjusted and implemented into planning. With the Regional Finance Agency and *Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu* at Depok City Government, they worked on research products and findings, including plot maps, land value zone maps, tax data, facilities, and more to support the creation of the prototype. Finally, PT Pangripta Geomatika Indonesia provided SMART CITY with technical equipment such as drones, LIDAR, GIS, and data processing. This partnership is continuing beyond SHERA and SMART CITY aims to commercialize it to help fund further activities.

- **Assessment Instrument for Local and Regional Government**- SMART CITY partnered with the Ministry of Internal Affairs to create an instrument capable of assessing the progress of smart city development at the local and regional government level. The project began in 2018 when the CCR organized a focus group discussion with the Ministry on their needs. The Ministry expressed their intention to create a smart city assessment that could fit the context of Indonesia's governance development. SMART CITY concluded the initial assessment in 2019 and it is now being made into a web-based application. Once complete, it will serve as a definitive data analytics tool for the Ministry, in which it scores each city's governance progress through 10 smart city aspects and ranks all cities in Indonesia for quantitative and qualitative comparison. The result will provide the Ministry with a clear view of every region's development stance, evaluate development objectives to improve regional planning, and improve national-regional government relations.

Sustainability
SMART CITY developed and implemented a sustainability framework that aimed to make SMART CITY a go-to, reliable partner for the public and private sectors alike. In 2020, SMART CITY took a major step towards ensuring its sustainability by becoming a special research unit with legal standing at UI. Named Unit Kerja Khusus Pengabdian Masyarakat SMART CITY (UKK PM SMART CITY), the new research unit has seven goals:

- Development of web-based applications and a situation room to solve Indonesia's urban challenges.
- Carry out innovative research developments through consortium of high-quality researchers.
- Conduct community service improvements through national and international partnerships, as well as with government entities.
- Increase scientific publications and conference presentations to disseminate technology-based smart city innovation.
- Increase the number of smart city studies in Indonesia.
- Improve smart city systems for local and regional governance in Indonesia.
- Increase the financing capacity for SMART CITY programs.

In the short-term, SMART CITY plans to continue four of its activities initiated under SHERA: Consultancy services for local and regional governance projects, capacity-building activities for Smart City experts, commercialization of its Situation Room prototype, and the implementation of its Assessment Instrument developed with the Ministry of Home Affairs as part of its Smart City Certification and Metrics Institutions program.

Now that the CCR has legal standing to commercialize its programming, these four activities can serve as an income generator for operational costs and program sustainability and lead to new projects in the future. This is particularly true for its consultancy services, as SMART CITY had begun receiving such requests in 2018 but could not begin formally consulting until it became a legally recognized research unit in 2020. In addition to these activities, SMART CITY plans to continue its collaboration with the Smart City Center at Universitas Udayana and hopes to also continue working with its U.S. partners in a formal capacity. As a result of its strategic planning for sustainability, SMART CITY is well-positioned to continue its work in Indonesia for many years to come.

II. IIE Capacity-Building Support

SHERA served as a learning laboratory for collaborative research program management and institutional capacity building. Prior to the program, only one CCR Lead HEI had previously been the direct recipient of USAID funding. Yet, IIE actively chose to award Indonesian HEIs, rather than U.S. HEIs, and allocated key managerial and program development functions to those institutions. It saw this approach as the only sustainable way forward for building the capacity of Indonesian HEIs to lead and management such collaborative research beyond USAID funding.

For the program to be successful, IIE had to simultaneously implement program activities while providing extensive training to the CCRs. It created a feedback loop between training, network building, and infrastructural development, while also supporting the CCRs' research, publication, and knowledge-building activities. This fostered an environment of active CLA.

This CLA structure demanded considerable time and effort from IIE staff. As seen in Table 6 below, IIE provided 146 training sessions and meetings. These sessions included the following topics: Grant management; research protocols; reporting, monitoring & evaluation; creating knowledge products; connecting to national goals/needs; publicizing successes; financial management; invoicing and paying subawardees; closing the gap between U.S. and

Indonesian research and management practices; providing updates and mentoring on current activities, and MEL reporting.

Table 6: IIE-led in-person and virtual training sessions and meetings with CCRs[7]

Number of sessions	Type of Capacity-Building Support
83	Grants management, finance, and program implementation
41	Monitoring, evaluation, and learning.
18	Joint CCR sessions on grants management, finance, MEL, communications, and program implementation
4	Communications and Outreach

Though there was an intensive period of training, monitoring, and adaptation at the beginning of the program, it is important to note that IIE provided continuous capacity-building support throughout the entirety of the program. As the CCRs entered different phases of the project, moving from project start-up to implementation, to network-building and sustainability planning, through project closeout, they required different types of support. Numerous challenges developed through SHERA, particularly around financial management. These challenges and lessons learned are detailed further in Chapter IV of this report. Despite challenges, the program achieved significant results and the institutional capacity of the Indonesians HEIs to receive and manage large international grants was increased as a result of IIE's interventions, as detailed in the following section.

Programming, Grants, and Finance

Figure 16: SHERA Quarterly Meeting, 2018

During the program start-up period in 2017, IIE conducted pre-award risk assessments for each CCR subrecipient. The results found that IIE needed to conduct extensive capacity-building exercises to ensure that the CCRs were compliant with USG regulations and could succeed in establishing and managing program activities. Accordingly, IIE's Finance and Grants (F&G) team, supported by the SHERA Program Director and IIE Home Office, developed very clear systems and procedures for both IIE and the CCRs. This included a robust accounting and oversight system, as well as a grants manual that IIE created to put in place uniform ground rules ahead of the CCRs' subagreements. With this groundwork laid, IIE planned extensive group and one-on-one trainings, as well as ongoing mentoring (in-person and virtually) from the March 2017 program launch onwards. The trainings were adaptive in nature and based on assessment findings, each catered to fit the CCRs' individual and group needs.

IIE's adaptive management approach included conducting intensive program mentoring through in-person and virtual meetings and group discussions; provided close supervision and support to CCR program managers and directors regarding the CCRs' work plans, activities, and achievements; supported CCRs in developing standard

[7] For full list of training sessions and meeting, see Annex II of the SHERA Final Evaluation.

procedures for program management and activities; increased CCRs' systems for knowledge management; communicated management and program learnings to all CCR members; created robust reporting procedures and templates for institutions; and established a standard monitoring dashboard for each CCR to monitor their performance. Below are highlights from SHERA's Programming and F&G training interventions during each year of program implementation:

Table 7: IIE Capacity-Building Activities for CCRs, FY2017-FY2020

FY2017	
Program Launch Four-Day Training *March 2017*	• Overview of program requirements and expectations • USG rules & regulations • Intro to F&G management, SHERA Grants Manual
One-on-one Intensive Workshops	• Based on assessment of program launch training, needs of each CCR • Continued USG compliance training, F&G management, and Year 1 work planning • Structuring affiliate partnerships • QuickBooks development and implementation • Maintaining an organized filing system for documentation of monthly expenses and best practices for internal review and approval systems. • Reporting templates
Meetings with GOI	• Trouble-shooting gaps in management practices between CCR Lead HEIs and affiliates, particularly lack of financial autonomy at affiliate level.
FY2018	
Quarterly Meetings with CCR Leads *January, March, & July 2018*	• Report on progress, successes, challenges, solutions, and lessons learned across CCRs and IIE. • Conduct planning for upcoming quarter, review work plans and budgets • Joined by representatives from GOI, USAID, and IIE Home Office as needed to provide guidance, subject-matter expertise, and technical assistance
Monthly Work Planning	• Developed monthly work plans, structured by activity, to assist CCRs in activity implementation. • Cross-referenced the plan against the CCRs' monthly reports, research log sheets, and mentorship logs to analyze achievements against the plans and targets • Used data (in coordination with MEL team) to assess program approach and strategy
Execution of Affiliate Subagreements	• Supported the negotiation and execution of CCR agreements with U.S. and Indonesian affiliates • Shared subrecipient document templates, tools, and training materials • Provided 17 one-on-one sessions with CCR Leads to give targeted support on subagreement negotiation
SHERA Annual Conference *July 2018*	• Brought together universities, government entities, research and development institutions, the private sector, NGOs, and donors to discuss ongoing research partnerships and future collaborations • Facilitated knowledge exchange among participants
Annual Assessments *July-August 2018*	• Reviewed Year 1 Implementation Plans (IPs) against achievements, based on KPI targets and actual spending • Developed Year 2 work plans and budgets • Created rating system across seven variables to determine that CCR Leads still needed close monitoring by IIE in order to ensure compliance with USG regulations and subaward terms
FY2019	
F&G Refresher Workshops *November 2018 & April 2019*	• Led by IIE's Home Office Finance Operations Specialist, November 2018 workshop introduced upcoming revisions to financial reporting requirements, designed to streamline processes and provide better support for financial monitoring

	• Trained CCRs on the revised financial reporting templates, including new advance request template for efficiency in approval processes • Discussed IIE expectations on invoicing and clearing advances per the terms of the subagreements • Refreshed training on QuickBooks and asset management • Supported CCR F&G Managers' capacity in managing their roles and responsibility as reviewers and budget managers • Reviewing procurement plans and backup documentation. • Introduce fraud detection policies and actions. • Reviewed reporting processes for increased efficiency and reporting quality
Revised CCR Subawards with IIE	• Revised financial reporting requirements and the advance request process
Site Visits *Throughout FY*	• Evaluated CCR progress and adjusted work plans for year ahead • Planning revised budgets based on USAID funding limitations • Shifted planning to financial and programmatic sustainability • Subrecipient closeout procedure mentoring for CCRs ARI and ANBIOCORE
Strategic Meetings with CCRs *February & August 2019*	• Disseminated, discussed, and planned for USAID's new CDCS • Discuss the program's limited funding availability • Strategized potential early program closure and external funding opportunities with representatives from USAID and GOI
FY2020	
Subrecipient Closeout Procedures and Sustainability Workshop *October 2019*	• Led by IIE's Senior Grants Manger, provided the CCRs with an overview of standard USG-funded subrecipient closeout procedures • Introduced closeout timelines and define roles/expectations for the CCRs and their respective universities. • Reviewed, discussed, and practiced the proper completion of closeout documentation. • Reviewed each CCR's sustainability plans and identified potential implementation challenges. • Strategized new opportunities for sustainability and enhanced current CCR sustainability plans. • Provided subrecipient closeout document templates and guiding templates for workflow planning • Created a space for the CCRs, university leadership, IIE, GOI, and USAID to have an open dialogue about the project's limited funding.
One-on-one CCR Closeout Support	• Provided intensive, in-person support to CCR ARI and ANBIOCORE's low-performing administrative teams to ensure that both CCRs met USG compliance standards during the closeout of their respective subawards • Aided the three remaining CCRs on administrative and financial closeout, building on the training that they received in the closeout workshop in October 2020 • Worked to CCRs to create asset disposition plans in accordance with USG regulations
ITB Closeout Negotiations	• Led continuous outreach efforts while the CCR was unresponsive to ensure that ITB complied with IIE and USG closeout regulations and properly closed its obligations and outstanding payments to U.S. affiliates. Further information included in Chapter IV of this report.

IIE spent significantly more time and resources than initially expected providing capacity building and technical assistance to the CCR Leads. Along with ongoing mentoring, IIE determined the need for consistent monitoring and oversight of the CCRs to ensure financial and regulatory compliance, as well as program implementation success. Further information on IIE's challenges with CCR spending and financial reporting can be found in Chapter IV of this report. However, through IIE's extensive efforts, these challenges were largely overcome. One-on-one sessions with CCRs provided important opportunities to address CCR-specific questions and

challenges, while during the group sessions, CCR Leads shared best practices and lessons learned that could be replicated by other CCRs. The CCRs learned how to consistently submit complete financial reports with all required backup documentation by the reporting timeline. Reporting standards and expectations were communicated across all parties, reducing less back and forth between the CCRs and IIE reviewers. CCR Leads increased their understanding of their internal institutional process flows and policies, and eventually began to submit advances based on projections and reimbursement requests based on actuals. The CCRs also reported that despite the initial learning curve, they were very happy with the financial systems and support from IIE.

Figure 17: SHERA F&G meeting with SMART CITY management team

Ultimately, IIE's continuous training and adoption of a CLA approach to program management decreased the CCR's administrative burden that had resulted from their initial learning curve, streamlined the reporting and advance reconciliation processes, increased CCR burn rates, and allowed the CCRs to shift their focus to implementing program activities, which led to the CCRs achieving, and oftentimes far exceeding, their set targets.

Communications and Outreach

As part of SHERA's capacity-building support to the CCRs, Communications and Outreach trainings were conducted to deliver timely and relevant support on a variety of issues pertinent to the CCRs' program implementation. SHERA staff understood that there is often a large disconnect between scientific research, publication, and communication that is geared to a larger public audience outside of academia. Therefore, the program largely centered its communications and outreach training efforts on teaching the CCRs how to boost their public awareness in an accessible manner, which would then widen their networks and support their sustainability efforts.

From 2017 through 2019, the following topics were covered in SHERA communications trainings:

- SHERA communications and outreach policies and procedures
- USAID policies and processes related to management of communications plans, impact statements, and online campaigns. This training also emphasized branding and marking regulations.
- Photography, press release guidance, and feature writing skills development.
- Kemristekdikti standards for communications products
- Advocacy through communications and outreach
- Most Significant Change model and story template, and how to conduct interviews and gather data using the Most Significant Change method.

Further information on SHERA's broader Communications and Outreach support and activities for the program can be found in the next section of this report.

Monitoring, Evaluation, and Learning

In addition to the extensive grants, finance, and outreach and communications training that IIE provided to the CCRs under SHERA, so too was its MEL capacity building efforts. At the start of the program, IIE conducted CCR needs assessments to identify areas where CCR Leads needed immediate capacity building. The SHERA team conducted in-person and virtual meetings with the CCRs' MEL staff members throughout program implementation to ensure that they sufficiently understood and practiced properly recording and reporting data using IIE's tracking and reporting tools. Training topics included but were not limited to the following:

- SHERA MEL Tools and Templates (updated throughout program to better suit CCR needs)
- Recording data based on evidence, analyzing based on the needs of multiple stakeholders (including the CCR, IIE, Kemristekdikti, and USAID), and reporting in a timely fashion
- Aligned techniques for collecting data across research clusters and topics
- Data entry for events, mentorship logbooks, and research logbooks
- Data input in the MIS platform and feedback on the platform
- Updates to the SHERA Results Framework and Performance Indicator Reference Sheets (PIRS)

Additionally, IIE also conducted a MEL and Communications training in November 2018 on Bangka Island. Representatives from each CCR, the local affiliate Universitas Bangka Belitung, and local community members joined. This training was designed to move improve the participants' knowledge of the program's M&E concepts, Theory of Change, and results-based management. A unique aspect of the training was that the participants had the opportunity to practice their newly acquired knowledge and skills by taking photographs of researchers' activities at UBB's lab and interviewing the researchers and the communities in Semujur, all while capturing and recording their M&E data. In their review of the training, the participants noted that the interactive sessions helped them to better understand the materials and appreciated the newly acquired knowledge. They also noted that the training should be presented to their senior level management team to better design CCR activities.

III. Communications and Outreach Activities

Throughout the USAID SHERA program, IIE provided robust communications and outreach support for program activities through its in-country partner, the Indonesia International Education Foundation (IIEF). This was a crucial element in SHERA's design, as the Communications and Outreach Specialist both disseminated information about the program and its impact to an external audience, while working directly with the CCRs to build their capacity. The following section details the communications and approach, as well as the ensuing activities and their impact.

Communications and Outreach Plan

In January 2017, the Communications and Outreach Specialist developed the program's communications strategy. This document sought to enable the program to focus its message and reach its target audience, as well as inform the efficiency and effectiveness of the communications tools used to share this message. It clearly outlined the program's strategic communications objectives and the activities planned to achieve these objectives, explained how these objectives and activities would be supported, and listed the expected outcomes against which the program would measure success of each activity.

SHERA required each CCR to build and maintain a virtual portal using a user-friendly and inexpensive platform for communications, which included a free website, blog, or social media platform. The Communication and Outreach Specialist developed clear communications guidelines, which specified how CCRs were to conduct their branding and marking based on the USAID-approved Branding and Marketing Plan, regulations for managing their online portal, and how to share their stories with the media. The Communications and Outreach Specialist shared this information during the CCRs' first group workshop in March 2017, and once again during the one-on-one Kickoff Meeting in the summer of 2017. These trainings were supplemented by a SHERA subaward branding and marketing guide and grant manual. This guide was also included in each CCRs' subagreement with IIE.

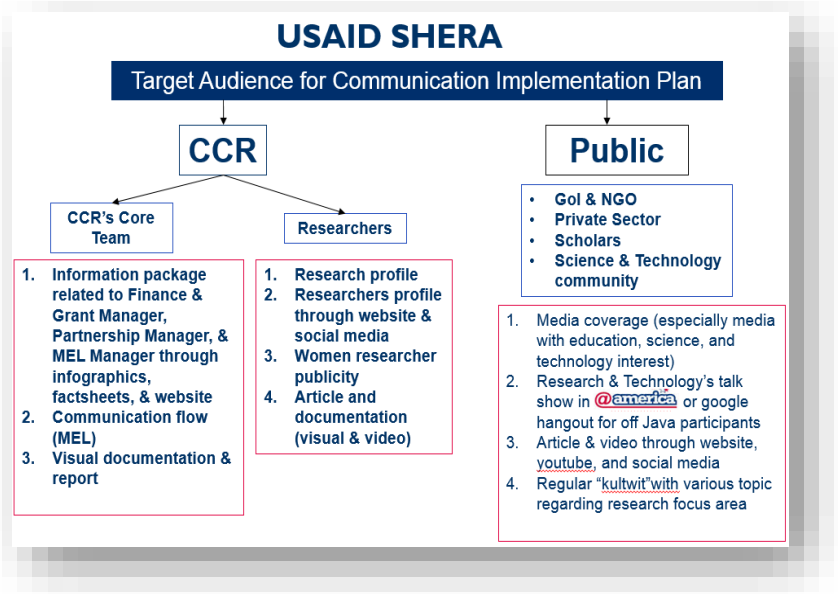

Figure 18: SHERA Outreach and Communication Plan

SHERA Communications Products and Success Stories

Communications Products

IIEF maximized the use of a variety of communications platforms to promote the program, including articles, posters, factsheets, booklets, videos, and images. Printed media was distributed during events and meetings with program and external stakeholders to enhance to the activity at hand and showcase the program's achievements. This practice also helped the CCRs in their outreach activities as they sought to expand their networks and connect with new external stakeholders.

In 2019, USAID requested that the CCRs develop a booklet highlighting their research. The goal of the booklet was to help an external audience understand the CCRs' research activtities in laymen's terms and the research's impact on Indonesia. The Communications and Outreach Specialist worked closely with the MEL Specialist from each CCR to identify and develop the best stories to highlight their work. Shortly after this request came through from USAID in FY2019, the CCRs learned that they would receive significantly less funds than they had anticipated under SHERA. With the subsequent redesign of program activities and priorities, the CCR booklets came together in varying levels of success. However, CDSR and SMART CITY put together strong products that highlighted their accomplishments and outlined their plans for the future.

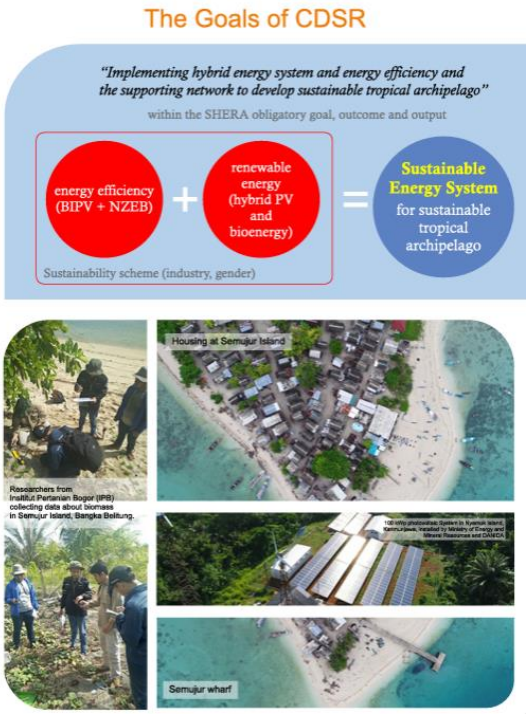

Figure 19: Excerpts from CDSR (left) and SMART CITY (right) booklets

IIE and IIEF also created a booklet highlighting SHERA's achievements towards the end of the program's in-country operations in 2020. This booklet marked the close out of SHERA program activities and was formally presented to Kemenristek/BRIN on November 3, 2020.

Success Stories

CCR success stories became a significant tool that the program used to measure the unintended achievements of the CCRs that had not been directly captured in the program's KPIs. In the beginning of SHERA, the CCRs struggled to adequately capture and develop success stories that could easily demonstrate their impact to an external audience. This issue, which is broadly seen across academia, required extensive coaching from the SHERA team. Learning from what was and was not working with the CCRs, SHERA's MEL Specialist and Communications and Outreach Specialist created a Most Significant Change (MSC) reporting template in FY2019 that was incorporated in the CCR's quarterly performance report. This mechanism built the capacity of the Indonesian HEIs and allowed them to select stories that showed how their research could be utilized and sustained.

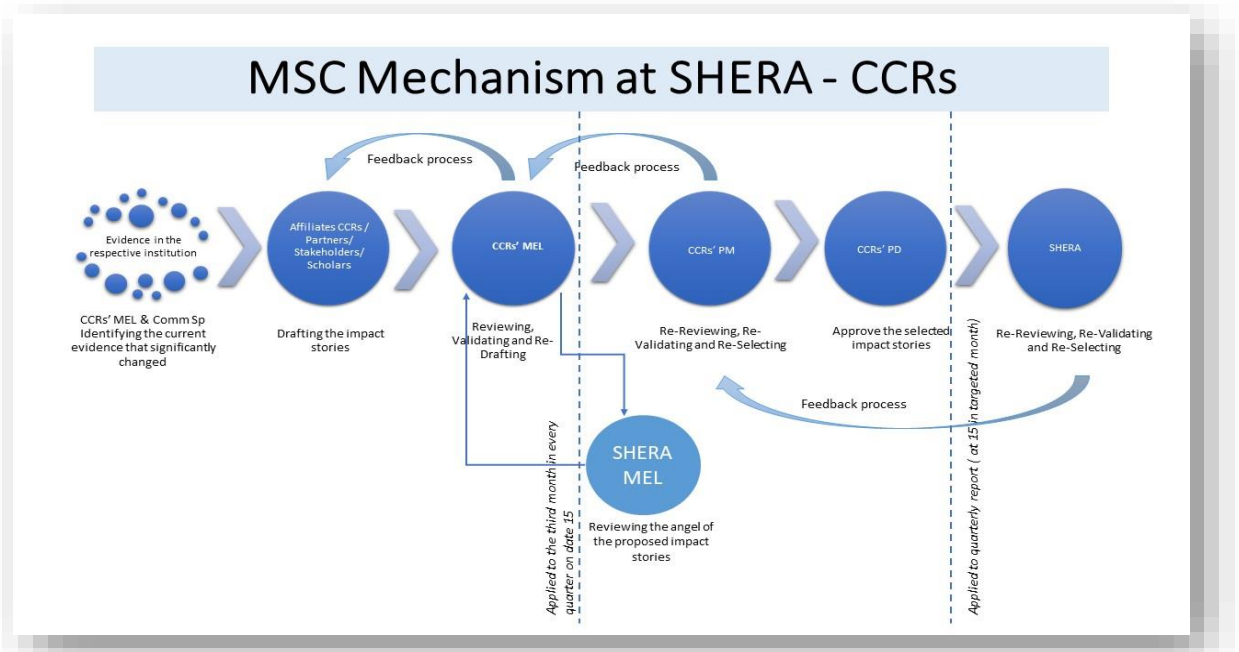

Figure 20: Most Significant Change reporting mechanism

Using the MSC reports, SHERA's Communications and Outreach Specialist also conducted interviews with key individuals from each CCR and affiliate to gather information on lessons learned, and challenges that were faced during the program. This approach especially gave voice to the affiliates, rather than just the CCR Leads. All this information was incorporated into success stories and published on SHERA's website and social media platforms. Select success stories for each CCR can be found in Annex V of this report.

Media and Digital Outreach

Media Outreach

IIEF supported SHERA in communicating with Indonesian media outlets by developing a media outreach program. The first major media coverage occurred during the program's Launch Event in March 2017. A press conference followed the event, led by Kemenristek/BRIN's Head of Cooperation and Mass Communication. It included the USAID Mission Director, and the GOI's Minister of Research Technology, Secretariat General, and Directorate General of Research & Development Strengthening. Twenty-two reporters attended the press conference, which resulted in 33 media posts in both newspapers and online new sources.

Figure 21: Press conference at the CCR Launch Event in March 2017

Throughout the program, the Communications and Outreach Specialist disseminated program achievements and updates through press releases and provided journalists with access to the CCR researchers. As part of this activity, the Specialist conducted media monitoring which tracked how many articles were

published about SHERA. In total, there were 88 articles, both in print and online (full list in Annex VII). This data was shared with USAID throughout the program in the IIE's quarterly performance reports.

Digital Outreach

Following the SHERA Launch Event, the SHERA Communications and Outreach Specialist maximized the use of the program website, social media and local events to promote the program. In early 2017, SHERA launched three main social media accounts on Facebook, Twitter, and YouTube. SHERA's social media accounts linked to the program website and sought to reach a broader external audience. It used Twitter, for example, to boost CCR researchers and program activities, then linked followers back to relevant program and CCR websites. SHERA's Facebook page not only shared program highlights, but also posted relevant policy and procedural updates as it relates to research in Indonesia. For example, when Kemristekdikti's Directorate General of Research and Development Strengthening updated its application for foreign researchers traveling to Indonesia for work, it contacted SHERA's Communications and Outreach Specialist and requested that SHERA share this information within its network.

The Communications and Outreach Specialist worked closely with each CCR to train and mentor their staff in digital outreach strategy and tools (see further information below under training). Due to that support, each CCR developed its own website and social media handles. By FY2019, SHERA's online presence served to supplement the CCRs' own websites and social media handles.

In April 2018, IIE established a program website once it received approval from USAID/Indonesia and the Website Governance Board. The SHERA website, which served as a landing site for both the CCRs and an external audience, hosted an overview of the program, overviews and links to each CCR Lead partner institution and affiliates, research objectives, and planned activities. The website also linked to articles on CCR research projects, events, partnerships, and program updates. Once IIE and USAID determined that the program would cease activities in September 2020, the Communications and Outreach Specialist worked with USAID to transfer all website data before the website closed. IIE, which hosts a SHERA webpage on its website, has continued to maintain its webpage beyond program closure to provide information on the program and its achievements.

Figure 22: SHERA Digital Outreach Highlights

Events and Trainings

Events

IIE, in partnership with IIEF, developed and hosted 21 outreach events during the SHERA program that were attended by over 1,500 participants. This was in addition to representing the program at numerous external events. The program's initial outreach push began in 2016 during the NOFO period, as IIE, USAID, and Kemristekdikti worked together to promote the program. The goal of these events was to conduct outreach to prospective HEIs, assess the research and partnership capacity of existing HEIs and Centers of Excellence, share additional information about USAID SHERA, and encourage institutions to engage with potential partners in the U.S. and Indonesia. From September through November 2016, the program held 12 outreach events with over 200 participants. The SHERA team also held an information session in November of that year that was attended by 80 individuals from 11 HEIS and three research institutions. As a result of its outreach efforts, IIE received 49 complete applications in response to its NOFO.

Once the CCRs were selected in 2017, SHERA's outreach focus shifted to showcasing the program and the CCRs' work to external stakeholders and the general public, demonstrating the utility of cutting-edge research and university partnerships in Indonesia. This can be seen in the table below, where events such as the SHERA Talk Shows showcased the CCRs' research to the public in Jakarta. These events not only demonstrated the value of the program to a broad, sometimes international audience, but they also helped the CCRs expand their networks, thereby supporting their sustainability. Towards the end of the program, as CCRs stepped up to develop and lead their own events, the SHERA Communications and Outreach Specialist moved into a support role, assisting the CCRs with media and coordination support as needed for events such as the Annual International Conference on SMART CITY Innovation, led by CCR SMART CITY.

Table 8: SHERA External Outreach Events (2017-2019)

Event	Purpose	Date
SHERA Launch Event	Event was ceremonial launch of the program with each new CCR partner and VIP representatives from GOI, USG, and university leadership. Included remarks from VIPs, a gallery walk, and press conference.	March 21, 2017
Talk Show-Marine Science Research and Innovation	SHERA held its first SHERA Talk Show on October 3, 2017 in @america, the US Embassy's cultural center in Jakarta. The purpose of this event was to showcase the SHERA program and its researchers' work to the public. This event specifically discussed the researchers' work related to maritime innovation.	Oct. 3, 2017
Talk Show-Women in Technology and Science in Indonesia	To celebrate Indonesia's National Women's Empowerment Day, SHERA conducted its second talk show event in @america, presenting the stories of several of SHERA's women researchers. They shared experiences and lessons learned as women who dedicated their lives to improving Indonesia's science and technology sector.	Apr. 24, 2018
SHERA Annual Conference	Centered around the theme of "Partnership for Innovation," the conference brought together universities, government entities, research and development institutions, the private sector, non-governmental organizations, and donors to discuss ongoing research partnerships and future collaborations while facilitating knowledge exchange among participants. One day of the event was open to all stakeholders and the public, in which CCRs presented their research and achievements Along with current private sector partners, the SHERA team conducted strategic outreach to public and private institutions that could be strong partners for specific CCRs in the future.	July 9-11, 2018
Talk Show-Solution for Mobility in Indonesia	SHERA's third talk show in @america highlighted the topic of urban transportation. NCSTT researchers shared solutions for transportation challenges in Indonesia. As with previous SHERA Talk Shows, participants included students, researchers, and scholars from HEIs in the greater Jakarta metro area, GOI officials, development partners, and local high school students.	Apr. 30, 2019
HAKTEKNAS	Kemenristek/BRIN organized an Annual Research and Technology Day to celebrate Indonesia's National Technology Day (HAKTEKNAS). Representatives from the GOI, Embassies, local governments, researchers, scholars, and the private sector attended the event. SHERA helped provide all communications materials showcasing various research topics conducted by CCR and engaged with local media to provide press release and other information regarding SHERA's participation in the event.	Aug. 2017, Aug. 2018, Aug. 2019

IV. Stakeholder Engagement

Government of Indonesia

Throughout the life of SHERA, the Government of Indonesia played a key role in supporting and ultimately taking ownership of the program. In particular, the Ministry of Research and Technology/National Research and

Innovation Agency (Kemenristek/BRIN) was the Ministry that SHERA primarily interacted with during the launch, implementation, and closeout of the program. Kemenristek's active support leant legitimacy to SHERA, ensured the Government of Indonesia was a key stakeholder, assisted in the implementation and evaluation of the program, and was prepared to take ownership of SHERA after is completion.

Kemenristek support during the launch of SHERA was critical to its initial success. Kemenristek identified qualified candidates to serve on the SHERA Advisory Board. The SHERA Advisory Board was formed to provide guidance on the initial program design and implementation. Kemenristek also met with SHERA to provide their input into the design and early implementation of the program to ensure the goals of the program matched those of the Government of Indonesia. Kemenristek worked closely with SHERA in identifying and recruiting candidates to review proposals from Indonesian HEI's applying for a grant to implement a CCR. In addition, once CCR candidates were identified, Kemenristek supported IIE's risk assessments of the candidates. The risk assessments entailed field visits to the Indonesian HEI to meet with senior institutional leadership for one-on-one meetings. Kemenristek facilitated introductions and supported the field visits and without their support, the process of conducting the risk assessments would have been more time consuming. When it was time to officially launch SHERA and introduce the CCR's, Kemenristek provided their event space free of charge. Kemenristek's supported the launch of the SHERA in a number of ways but their involvement also contributed to the legitimacy and importance of the program.

Throughout the implementation of SHERA, Kemenristek continued to provide support by problem solving, inviting SHERA to events, leading international delegations, and attending SHERA events. During the development and execution of the CCR subagreements, Kemenristek assisted in resolving potential problems. For instance, when UGM expressed concerns about the intellectual property rights section of their sub-award, Kemenristek helped facilitate a discussion to resolve the issue. In 2017 and 2018, the GOI invited SHERA to attend the Ritech Expo which is Indonesia's annual exhibition of research, innovation, and technological development to celebrate HAKTEKNAS. In 2018, the Kemenristek Director led a delegation to the U.S. to explore research opportunity partnerships with U.S. universities. One of the results of the visit was the development of a partnership between MIT and ITB.

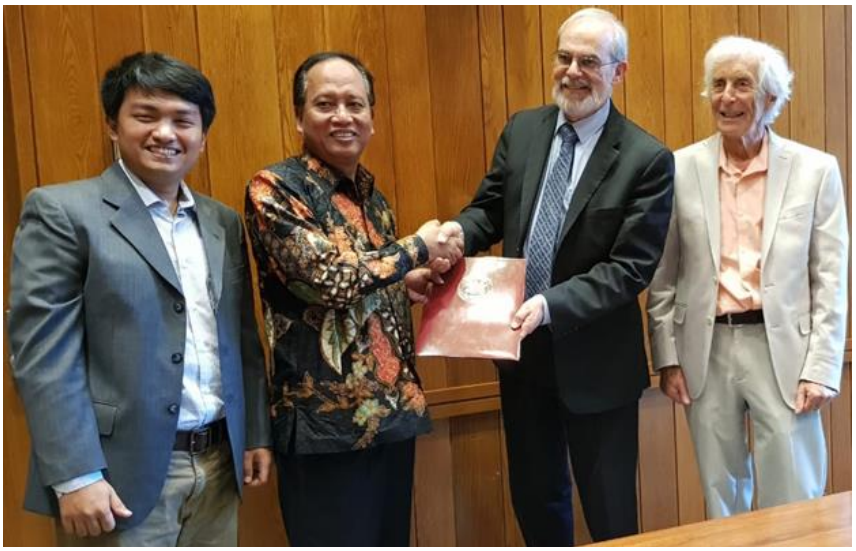

Figure 23: NCSTT scholar Dr. Poetro Sambegoro (left) accompanied Kemrisktekti Minister Nasir during a meeting with MIT's Chancellor of Academic Advancement William Grimson (right)

Kemenristek support and involvement in issues related to procurement, funding, and operational issues faced by the CCR's was critical in ensuring their resolution. For instance, in some cases SHERA funding was initially wired into the Indonesian HEI Rectorate's account and it was difficult for the CCR's to access the funds. To assist with addressing the issue, Kemenristek hosted a meeting with the CCR's to listen to their funding challenges and subsequently sent a letter to each institutions' Rector to inform them of the problem and seek their assistance.

Kemenristek participated in events, received reports, and requested meetings throughout the life of the program to keep abreast of achievements, assist with challenges, and actively support the program. Via USAID, SHERA provided Kemenristek with annual BAST reports which provided financial information and programmatic achievements. Kemenristek also participated in knowledge sharing events and met periodically with SHERA and USAID to discuss the progress of the program.

As SHERA finalized activities and closed its field office, it coordinated closeout activities closely with USAID and Kemenristek. SHERA's office equipment and supplies were transferred to Kemenristek. SHERA worked closely with Kemenristek to provide an overview of the program including specific discussions about indicator targets and the potential transfer of the MIS monitoring and evaluation system to Kemenristek. SHERA presented an overview of the final evaluation to Kemenristek along with recommendations of how Kemenristek may continue to play a role in supporting the CCRs. Kemenristek held meetings with the CCRs during the transfer of program ownership from SHERA to Kemenristek. Ultimately, Kemenristek engagement throughout the life of SHERA ensured its success, added legitimacy to the program, and created a smooth pathway for the transfer of the program to Kemenristek.

Private/Public Sector

Private and public sector engagement was a key component of SHERA. However, the reduced level of funding for the program in 2019 resulted in the cancellation of activities to support PPP engagement, including a scheduled private sector engagement conference (see further information in Chapter IV). Regardless of the funding reduction, the CCRs established several PPPs[8]. The research and innovation generated by the CCRs was coupled with the need by private and public sector entities to apply the research and develop partnerships to ultimately assist addressing Indonesia's development challenges. The PPPs served to refocus the CCRs' theoretical research into pragmatic approaches to address development issues; develop new networks; and share resources and information. At the end of the program, all of the CCRs established at least one PPP, while others established multiple PPPs, which in turn will contribute to supporting their sustainability. A full list of PPPs can be found in Annex III of this report.

At the start of SHERA, USAID's Global Development Alliance (GDA) introduced SHERA to several of its private sector partners. To support partnerships, IIE headquarters also reached out to and introduced SHERA to several of its private sector partners. While the start of the SHERA focused on capacity building and the management of CCR subagreements, more attention to the CCRs' partnerships plans with potential private and public sector partners would have contributed to a more robust CCR sustainability plan that could be cultivated throughout the life of the program.

During the implementation of SHERA, several activities were undertaken to cultivate, support, and grow PPP with the CCRs. SHERA facilitated a number of meetings to facilitate PPP, including IIE's Vice President traveling to Jakarta to meeting with USAID GDA representatives; SHERA presenting at the American Chamber of Commerce, Partnerships for Sustainable Communities, and IIE Centennial Forum; and SHERA attending the Indonesian Development Forum.

The level of CCR experience cultivating and developing PPPs varied – some with established partners and others seeking to identify potential partners. To support the varied PPP needs of the CCRs, SHERA hired an Indonesian-based private sector consultant and utilized the expertise of the US-based staff person to conduct outreach to potential PPP; support partnerships; coach CCRs on aspects of future or current PPP they would like to strengthen; and organize events. One important aspect of the Indonesian private sector consultant's work was traveling to the CCRs to map out current and future PPP which in turn tied into and support sustainability plans. Both the US and Indonesian private sector specialist coordinated their work which included

[8] For further information on CCR-established PPPs, see Chapter 2: University Partnerships.

targeted outreach to potential partners in the US and Indonesia. In addition, the Program Director coordinated and supported PPP efforts including scheduling meetings between the CCRs and PPP. For instance, SHERA connected Thermo Fisher Scientific with NSCTT and ANBIOCORE.

While the CCRs strengthened or developed new PPP under SHERA, more focus at the start of the project on sustainability plans would have benefitted the CCRs. PPP takes a considerable amount of time and resources to develop. Accordingly, many partnerships that started under SHERA are a work in progress. In addition, the lack of SHERA funding contributed to some CCRs opting to not participate in PPP development.

Despite these challenges, SHERA raised the awareness, provided resources, and served as a forum for the CCRs to further develop PPPs. In addition, SHERA raised public awareness of universities generating research to address Indonesia's development challenge. By the end of SHERA, each CCR was in the process of implementing a CCR sustainability plan based on PPPs and many of these collaborations have already resulted in tangible outcomes. More can be expected in the future, as several agreements and projects already testify (see University Partnerships section above for further information)

Chapter 3: Achievements and Results

I. Monitoring, Evaluation, and Learning Methodology

The implementation of the SHERA program included systematic monitoring, evaluation, and learning to document the processes, outputs, and outcomes of program activities. SHERA's KPIs were used to measure progress towards targeted activity results, identify shortcomings in activity interventions, and inform decisions to adjust course and facilitate communication of results to USAID and other stakeholders.

The SHERA M&E Plan, which outlined the steps for integrating data collection activities throughout the project cycle, relied upon methodical collection, analysis and reporting of quantitative and qualitative information. IIE, which hired a full-time M&E Specialist in Jakarta, trained staff in relevant data collection methods and provided associated feedback to component/task managers, partners, and field staff. SHERA's M&E was also coordinated with USAID/Indonesia's other ongoing projects to contribute to key activity results for the Mission. Due to SHERA's consistent monitoring, several indicators and their corresponding PIRS were updated based on CCR current practices over the course of program implementation. For example, in FY2019, IIE recommended to USAID that output indicators 1.2.3 and 3.1.1 should be deleted since they were a redundant measurement and inapplicable to the CCRs' needs.

Below is further information about IIE's MEL activities under SHERA.

Baseline Assessment and Quality Benchmarking

Since the success of the program was dependent on the development and sustainability of the CCRs, IIE contracted Dr. Susan Buck Sutton, a higher education partnerships specialist, to conduct a baseline assessment in 2016 on the research and management environment for international partnerships at Indonesian HEIs. The assessment sought to understand Indonesian HEIs' current research and management capacities, as well as their past and current engagement in international collaboration. Dr. Sutton conducted an extensive desktop review of best practices and lessons learned from past international partnership programs with Indonesian HEIs and utilized a broad range of current data to understand the gaps and shape the baseline assessment questionnaire. The USAID SHERA team also conducted field research directly with Indonesian HEIs between August-October 2016. The resulting baseline questionnaire, which was shared with 12 HEIs during outreach meetings in 2016, gauged the research and partnership capacity of these HEIs and assessed their financial and grant management systems and capacity to manage USG grants while remaining compliant with USAID regulations. All the above was compiled into a White Paper called *Assessment of the Landscape for Establishing Centers for Collaborative Research That Advance Science, Technology, and Innovation in Indonesia,* which was published in January 2017 and is available on the USAID Development Experience Clearinghouse (DEC) website. The findings also greatly contributed to the development of the USAID SHERA NOFO.

The assessment emphasized that there was a group of Indonesian HEIs well-positioned to take the role of the lead; however, it also outlined the risks involved, stating that "the risk in transitioning the lead position to Indonesian, HEIs is that they have had little, if any, experience designing and administering projects funded by the U.S. This is new territory for both sides and will require much bi-national discussion, negotiation, advising, and monitoring as the CCRs are put into action." SHERA used the insights gained from the baseline assessment to design its institutional partnerships program, including identifying an outreach strategy to reach well-positioned Indonesian institutions, determining the research focus areas and partnership structure, developing program policies and procedures, conducting risk assessments to the selected candidates, and negotiating their subaward terms and conditions.

While subaward negotiations were underway, SHERA also conducted a CCR-specific baseline study to assess the CCRs' condition on the following:

- Partnership capacity and understanding of roles and responsibilities within the CCR.
- Collaborative research capacity, including research quality, access to journals and readiness to utilize IT-based virtual platforms.
- Current activities and resources as they relate to SHERA's results framework.

SHERA found that most CCRs were at the low-middle level, meaning that they had some knowledge and experience in partnerships and collaborative research, and resources and activities related to SHERA's results framework. The initial findings of the baseline study exposed the strengths and weaknesses of each CCR member and illustrated the capacity gap between and among the lead and affiliate institutions. This then allowed SHERA to identify and conduct technical assistance and capacity building activities to ensure the CCRs' success in implementing their activities, meeting their target numbers, working towards sustainability, and supporting SHERA to achieve its program objectives.

During this time, SHERA also conducted a participatory quality benchmarking process to define the minimum standards for CCR partnerships activities, data management procedures, and establish strategies for achieving program targets. The results were then shared with each CCR and among all CCRs to ensure that the program's MEL standards were consistent and high-quality. Given the unique structure and activities of each CCR, IIE also worked with each CCR to develop their own quality benchmarking that would also feed into the program's indicators.

Data Collection and Management

As part of SHERA's participatory design, each CCR Lead had a dedicated MEL staff member who would be responsible for collecting data at the partnership level and reporting it to the SHERA program team. As MEL is not a standalone process from a single unit, having a point person at each CCR was crucial for ensuring the program's data collection and quality across multiple units in the CCRs' systems. Initially, SHERA planned to collect and verify all data from CCR Leads and its affiliate partners. After conducting in-person and virtual conversations with CCR Leads in FY2017, SHERA determined it was best for the leads to manage and review their own affiliates' data. The revised approach supported the development of strong working relationships between lead and affiliate members, fostered trust and an open line of communication that will benefit all parties for the lifetime of the award, and ensured that the leads understood the baseline conditions within each affiliate member.

SHERA required all CCRs to include certain key indicators in their MEL plans that corresponded with the program's key indicators. However, based on each CCR program framework, they could develop a different customized indicator appropriate to its specific planned activities and focus research area. Each CCR was responsible to collect all data related to their own indicators and results from its affiliates activities and report to SHERA through the online system.

To support its data collection efforts, IIE established an offline data management tool using Microsoft Office. Then, IIE developed a shared online data storage system through Google Drive, as well as Google Forms for activity and beneficiary databases. Once data was uploaded, IIE's M&E Specialist reviewed and validated the data, contacting the CCRs to clarify or revise as needed.

However, from the onset of the program, IIE planned to develop a dedicated online management information system (MIS) for SHERA that would be rolled out to the CCRs in mid-2019. The purpose of the system was to assist with tracking performance, minimize the burden of reporting for lead university partners, while also

allowing for improved performance tracking. Though the Google Drive system outlined above was functional, it required more steps and placed additional burdens on both IIE and the CCRs.

In FY2019, IIE rolled out the MIS system to the CCRs and USAID. The powerful system allows the user to access key figures quickly, filter data, and export data as Microsoft Excel spreadsheets. As IIE unveiled the new system, it worked extensively with the CCRs to both train them on its functionality but also to receive feedback on the system so the programmer could make further edits. As of the program's closure, the MIS contains the program's cumulative MEL data through FY2020. Furthermore, to ensure the sustainability of the platform, IIE presented it to the Kemenristek/BRIN so that the government may further utilize the data to inform their own practices and to potentially model their own data collection after the MIS.

Sustainability Assessment

In 2019, USAID/Indonesia informed IIE that its Monitoring and Evaluation Support Program (MESP) would conduct a sustainability assessment of the program in April-May 2019 to determine how the CCRs' activities and partnerships could be sustained beyond USAID funding. USAID and IIE agreed that this assessment would replace SHERA's planned mid-term evaluation. The MESP team conducted 74 interviews with key informants and focus groups, in addition to conducting a survey of SHERA scholars. 61 scholars responded.

On June 26, 2019, MESP reported its preliminary findings to USAID and SHERA. On the whole, MESP found that sustainability planning was very thin at the CCRs, as they focused more on immediate activity implementation, and that in addition to tangible sustainability planning, the program needed to shift to focus on applied research solutions and USAID's Journey to Self-Reliance (J2SR). It also recommended that IIE make sustainability planning an "explicit and regular" part of SHERA implementation, embracing adaptive management as a sustainability tool, and work collaboratively with Ministry, University Rectors and CCR directors to align Ministry, University, CCR and SHERA visions. Following these recommendations, IIE coordinated a strategic meeting with the CCRs, MESP, and GOI officials in August 2019 to discuss the report's findings and critically plan program activities based on the results of the assessment. IIE then conducted a Subrecipient Closeout Procedures and Sustainability Workshop in October 2019, during which USAID, GOI, and university leadership attended and participated in sustainability planning exercises. Though IIE made sustainability planning a more explicit part of its approach in FY19 and FY20, it should be noted that collaboration with the CCRs was stunted due to the fact that USAID announced its funding limitations during the same time period that the MESP report came out. As discussed further in Chapter IV of this report, once the CCRs learned that they would receive no additional funding from USAID through IIE, their spirit of collaboration greatly diminished. Though they continued conversations with the GOI and other external partners to support long-term sustainability, the CCRs reduced their sustainability collaboration with IIE during their last months of program implementation.

Final Evaluation

IIE developed a Terms of Reference (TOR) for the USAID SHERA Final Evaluation in early 2020. The objectives of the Final Evaluation were to evaluate the program's indicators against its baseline findings, and to understand the program's highlights, lessons learned, and USAID SHERA's intended and unintended outcomes. Since the program's KPIs had not yet been established during the original baseline survey, it was not feasible to develop an endline survey as a direct comparison to the 2017 baseline survey. Subsequently, the Final Evaluation was adjusted to take the baseline survey into account, but also reflect the KPIs.

As the TOR was developed, COVID-19 became a global pandemic and it was clear that an in-person assessment would not be feasible. Accordingly, IIE centered its data collection efforts around a desktop review of CCR technical deliverables and virtual interviews with CCR management staff. Dr. Susan Buck Sutton, the author of the 2017 White Paper, returned to conduct the assessment and submitted her findings to USAID in August

2020. IIE presented the key highlights and lessons learned for future programming to USAID/Indonesia in September and October 2020, and again to the Government of Indonesia in November 2020. A summary of the Final Evaluation is provided in Annex IV and the full report is available on the USAID DEC website.

II. Program Achievements and Results

Program Goal: Sustainable Improvement in Quality and Quantity of Science and Technology Research in Indonesian Higher Education Institutions

Despite its shortened program timeline, the SHERA program made significant progress towards achieving its goal of sustainable improvement in the quality and quantity of science and technology research in Indonesia's HEIs. SHERA met 13 out of its 20 targets[9] in only two full years of program implementation (FY2018 and FY2019) and one partial year focused on program closeout (FY2020). As detailed throughout this report, IIE required significant time and resources to build the capacity of the CCRs, particularly at program startup. This required identifying what resources and supports were and were not there before the program, as well as what each individual CCR needed. As those needs changed over time, IIE also adapted its approach.

Due to IIE's initial investments in training and one-one-support mentoring for the CCRs in FY18, the program was especially able to maximize the CCRs' potential in FY19 before early program closures in FY20. The program exceeded five of its targets by 50% and boasted impressive numbers on the other six targets that it met. In addition to producing a high number of peer-reviewed publications (273), CCRs generated many citations, expanded partnerships, and had research initiatives replicated. Each CCR had its own strengths and challenges which led to variations in their ability to achieve particular KPIs, as seen in the figures below. These variances were largely based on their existing research and administrative structures, academic discipline, and type of research being conducted. However, all CCRs each rose to the top on different indicators. By looking at SHERA's goal and combining it with capacity and immediate products, each CCR was successful in its own right. Furthermore, a solid foundation has been laid for the CCRs to expand and enhance their high-quality work in the years to come.

Goal Indicator 1: Number of Peer-Reviewed Scientific Publications Resulting from USG Support to Research and Implementation Program

From FY2018 through FY2020, the CCRs produced 273 peer-reviewed scientific publications[10], 94% of which were Scopus-indexed. Additionally, based on the raw data, the CCRs produced 534 articles. Typical review and revision processes for academic journals often take two years from submission to publication. Considering that the CCRs did not begin receiving and spending funds until FY2018, this publication rate is an impressive feat. The high number of publications is a direct result of the program's capacity-building efforts. As demonstrated further in Outcome 1 below, the CCRs led trainings, often with their U.S. counterparts, that increased the Indonesian scholars' English-writing skills, enhanced their research skills, expanded their networks, and encouraged them to publish in peer-reviewed publications on timely development issues. This directly led to an increase in publications, particularly during the height of program activities in FY2019.

[9] See Annex I for list of KPI targets versus achievements.
[10] Per the PIRS for this indicator, the proceeding article has a value of 3 to everyone journal article (3:1). This revision to the definition was made in FY2018 to ensure the quality of the products published.

NCSTT and SMART CITY led the CCRs in publications (174 and 237, respectively). These impressive numbers are due in large part to the international conferences that both CCRs led. With these conferences, CCR scholars had the opportunity to network, collaborate, and submit their work to well-regarded international publications. CCR ARI, however, struggled to produce peer-reviewed publications. Strong research design allows for longer lead time, which is needed in medical research. Unlike the other CCRs' disciplines, medical research takes longer to plan and implement, as there are many more approvals to secure. Had the program activities continued through March 2021, CCR ARI would not have produced as many publications as the other CCRs but it would have been more successful on this front. As of its subagreement closure in January 2020, CCR ARI had submitted seven additional articles for publication and 14 drafts pending submission. Despite such setbacks, CCR ARI, ANBIOCORE, and the other CCRs learned from the experience and laid the groundwork for more publications and research collaboration in the future.

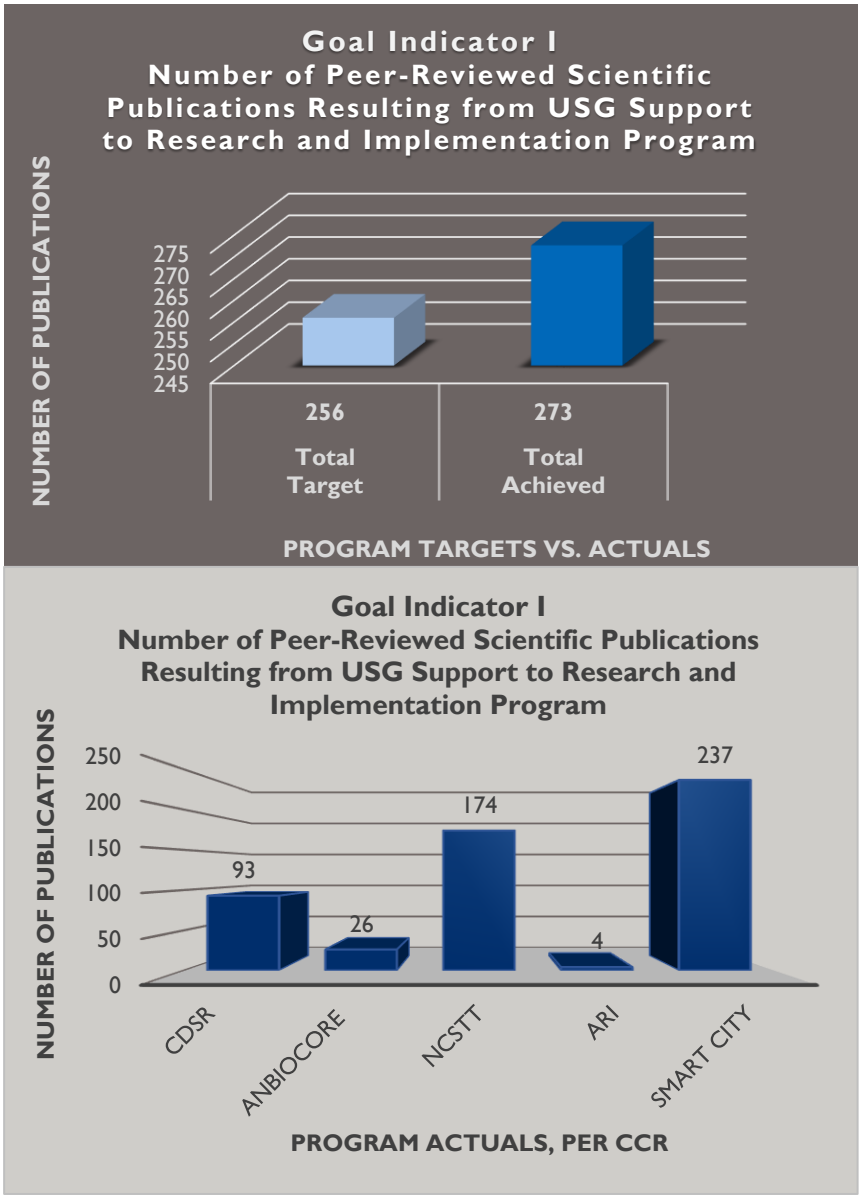

Figure 24: Goal Indicator 1 Program Targets vs. Actuals, Program Actuals Per CCR

Goal Indicator 2: Ratio of Citation to Publications Produced by Indonesian Researchers

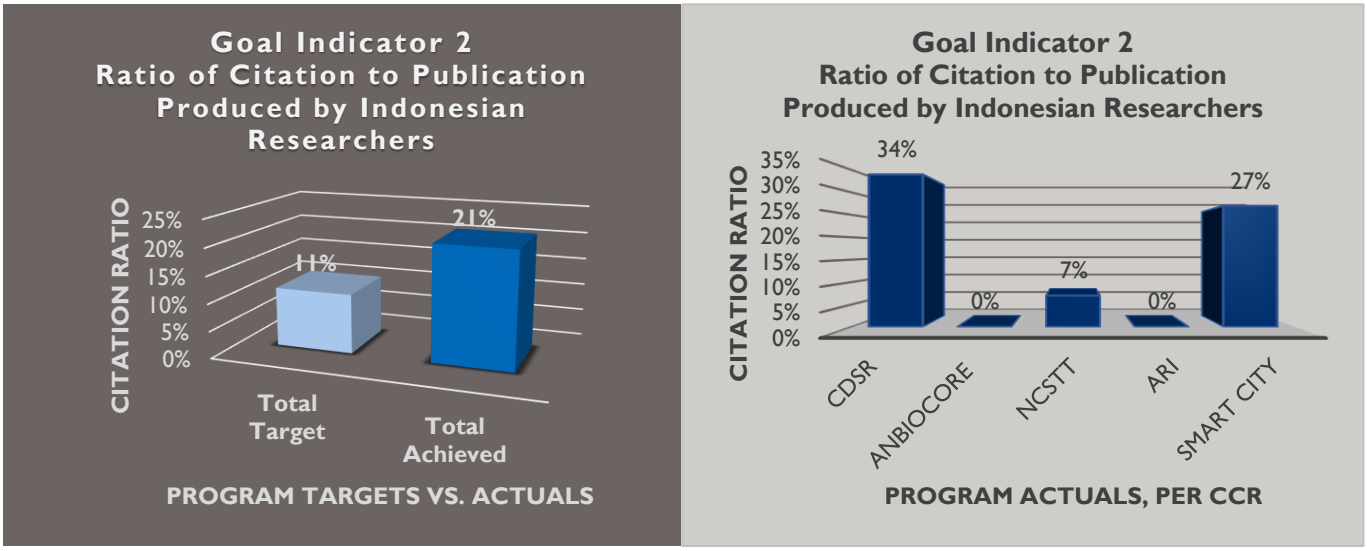

Figure 25: Goal Indicator 2 Program Targets vs. Actuals, Program Actuals Per CCR

The CCRs also exceeded their citation target under Goal Indicator 2. Out of the above publications, 21% were cited in 59 journal articles and 51 proceeding articles. The CCRs were initially concerned about this indicator, as it is outside of their control. Citations only occur when other researchers cite the work. However, IIE was committed to working towards this goal. As the scholars' capacity increased, so did their publication quality. With increased quality, their work was selected by respected international journals and their citations rose. Moreover, since the program emphasized cutting-edge research topics crucial to the development of Indonesia, interest was piqued and many scholars around the world turned to the CCR scholars' work to inform and supplement their own. It should be noted, however, that since this indicator was directly to the number of publications (Goal Indicator 1), CCR ARI and ANBIOCORE did not make progress on this front due to their low level of publication output.

Goal Indicator 3: Ratio of Academic Research Initiatives Whose Findings Are Utilized to Address Development Challenges

At the onset of the program, Goal Indicator 3 was originally defined as the "Number of academic research initiatives whose findings have been replicated, applied or taken to the market." In September 2019, USAID requested adjustments to this indicator, as well as Output Indicator 3.2, changing the number of academic research initiatives to a ratio, and changing the ratio under Output Indicator 3.2 into the number of partnerships. This request was based on USAID's Journey to Self-Reliance and updated CDCS (2018-2020), under which all grantees needed to increase their partnerships in joint research to better achieve sustainability.

Throughout the program, the CCRs struggled to meet the targets for this indicator and as a result, they did not meet the cumulative target of 5%. Only two CCRs (CDSR and SMART CITY) managed achievements under Goal Indicator 3. CDSR's sustainability assessment was adopted by the United Nations Development Programme (see Annex V for further information) while SMART CITY's sustainable energy storage systems were replicated across five areas in Indonesia. Research is a long and involved process that often takes years before it ready for the market, if it ever even reaches that stage. Without complete, tangible results, it is difficult for the research to be fully utilized. On top of the research itself, it can take years for a university to cultivate external partnerships that lead replication. Though the CCRs had opportunities for market replication in progress, they were unable to meet the definition of the indicator within the timeframe of the program.

While this concern was raised by the CCRs at the beginning of the program, the situation was compounded by the truncated program timeline and the cancellation of the Private Investment Summit. To the first point, the CCRs greatly increased their program activities in FY19 and had plans to further expand those activities in FY20. However, when they learned at the end of FY19 that there would likely be no additional funding for the program, they were forced to cancel many plans and refocus their efforts. The CCRs' final reports to IIE echoed this concern, with SMART CITY noting "CCR researchers needed more time to develop or apply their research initiatives. Their research was stopped short in August 2019 after the announcement of budget cut. However, CCR still achieved the target because one researcher had begun before receiving CCR funding, so the SHERA funding only helped complete the research during its implementation with other partners."

Understanding this challenge, IIE and USAID agreed to lower the FY20 target so the CCRs could more reasonably achieve this goal but ultimately, it was too late. Additionally, IIE had originally conceived of a Private Investment Summit in FY20 to draw in a variety of private sector partners and increase the CCRs' ability to take their research to market. However, with the limitation of funds and early program closure, IIE was forced to cancel the activity.

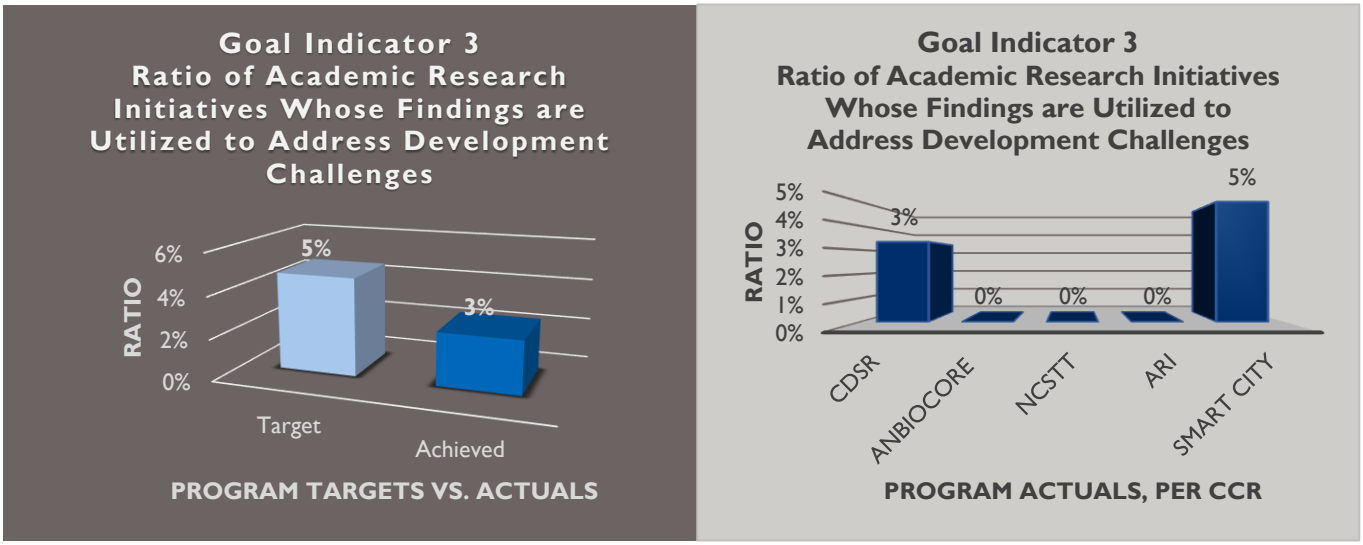

Figure 26: Goal Indicator 3 Program Targets vs. Actuals, Program Actuals Per CCR

Outcome 1: Improved Capacity of Faculty, PhD Students, and Researchers in Target Indonesian Universities

Correlated with the achievements under Goal Indicator I, the CCRs exceeded their targets for Output Indicators 1.1 and 1.2. Forty-six percent of CCR scholars presented at conferences, which included 250 CCR scholars. Of those presenters, 38% were women researchers. Additionally, 64% of SHERA's scholars worked with peers from a different institution and 60% participated in short-term training courses.
As the CCRs' capacity increased and program activities took off in FY2019, the CCRs hosted their own international conferences. This opened the door to many new opportunities for the CCRs as they networked, improved their research and presentation skills, and attended numerous other international conferences and events and increased their participation in collaborative research. Collaborative research was present across all CCR institutions and was supported by activities such as SMART CITY's U.S. mentorship program.

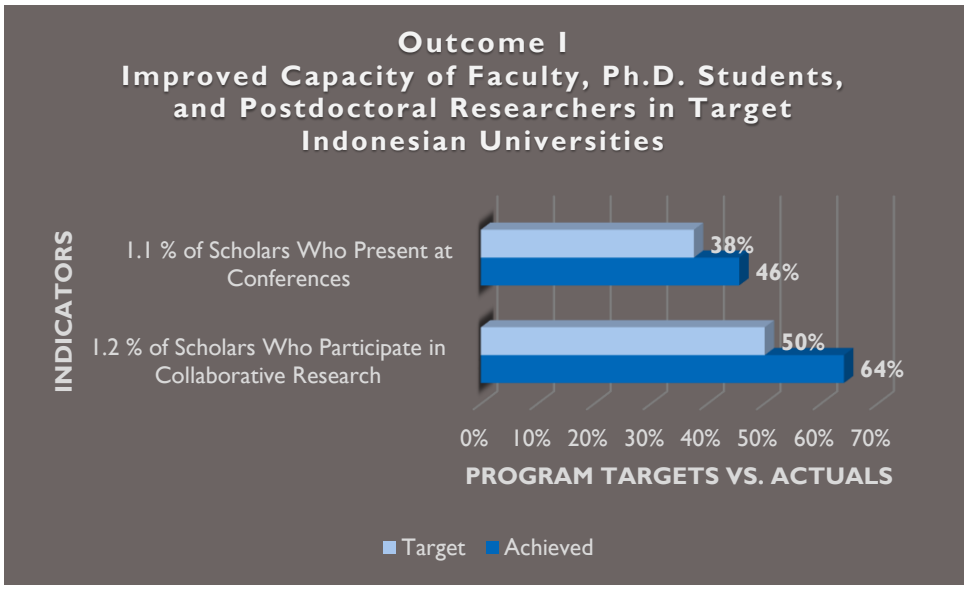

Figure 27: Outcome 1 Program Targets vs. Actuals

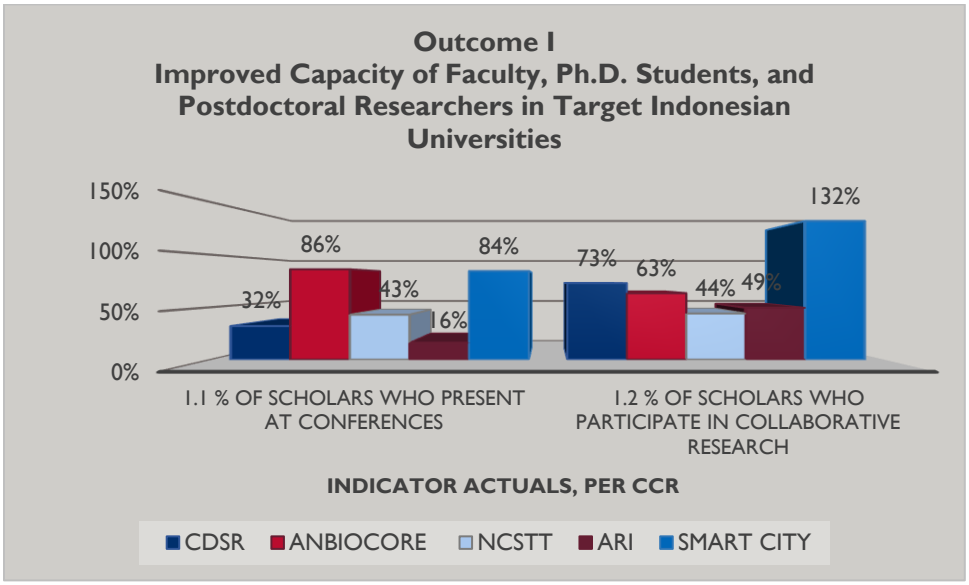

Figure 28: Outcome I Indicator Actuals Per CCR

Outcome 2: Strengthened, Inclusive Institutional Environment for Research and Management in Target Indonesian Universities

Though the CCRs did make significant strides under Outcome 2, they were unable to meet the targets for Output Indicators 2.1 and 2.2, as seen in Figures 25 and 26. The reason was two-fold. First, it was clear to the CCRs and IIE early in the program that Output Indicators 2.1 and 2.2 would take time to achieve. The development of policy in institutional collaborative research requires a variety of stakeholders at each institution to both create and approve the proposed policies. It was a lengthy process for the Indonesian research to receive approvals for draft regulations from high-level offices at their respective universities, such as Vice Rectors or Rectors. Second, once the CCRs learned that the SHERA program would be shortened and that there would be no additional funding, they were forced to amend their activities and subawards with many of

their affiliates. As a result, there were unable to achieve these targets. ANBIOCORE, however, stood out on Outcome 2, as it successfully adopted research protocols, Standard Operating Procedures, and established processes for scholar incentives and publications.

Under Outcome 2, CCRs exceeded their targets under Output Indicators 2.1.1. through 2.2.4. For example, 15 institutions developed improved research and management policies (2.1.1.). CCRs created 531 knowledge products, far exceeding the targeted 161 knowledge products (2.2.2.). The enthusiasm for public lectures and knowledge-sharing events was also high among the CCRs and they held 60 events (2.2.3.).

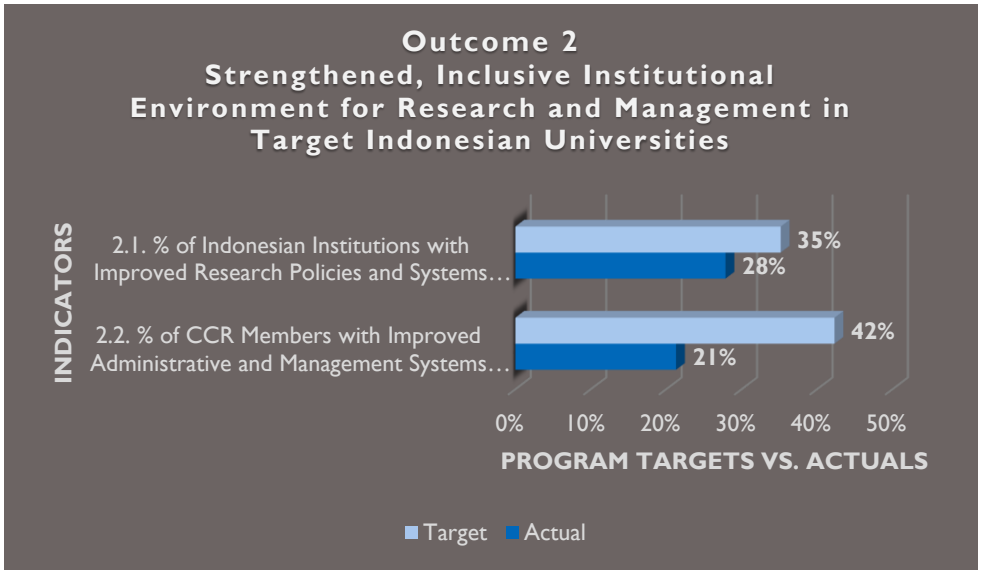

Figure 29: Outcome 2 Program Targets vs. Actuals

It should also be noted that the CCRs made great strides in incorporating gender sensitivity and inclusivity into their improved systems, thereby working towards SHERA's objective of increasing access to research and professional development opportunities for women. As part of its best practices, CCR ARI encouraged its partners and researchers to increase access for women researchers. This was then replicated by the other CCRs. SMART CITY, for example, developed a research administration and management policy that specifically integrated gender into their research business strategy by setting a baseline of 30% women research in each of their research groups, at the minimum. Additionally, the CCRs leveraged international conferences and events to promote gender equality and female empowerment in science and technology research (2.2.4.). As a result, they had 509 people, 351 of which were women, attend such events. The CCRs also produced 41 gender-specific knowledge products.

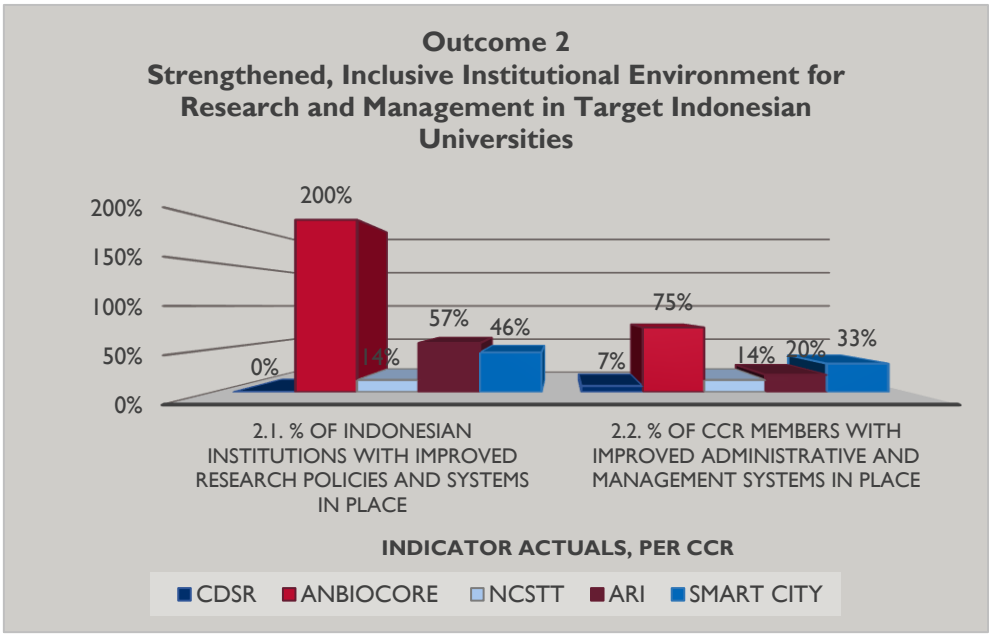

Figure 30: Outcome 2 Indicator Actuals Per CCR

Outcome 3: Enhanced collaboration in CCR/Consortium for Collaborative Research

By the end of SHERA program activities in FY2020, CCRs achieved and exceeded their targets under Outcome 3. For output indicator 3.1, 124% of targeted institutions engaged in joint research projects, while 54% of CCR partnerships were created to support joint research partnerships.

All CCRs successfully engaged their affiliates and CCRs ARI and ANBIOCORE were the first to begin working with public institutions, hospitals and livestock insemination centers, respectively. CCR ARI took the lead on Output Indicator 3.1, after it formed partnerships with 12 hospitals in Indonesia to both train hospital staff in new methods and collect data for its research. CDSR also expanded its collaboration with new partnerships so the CCR could improve its specialization in maritime knowledge.

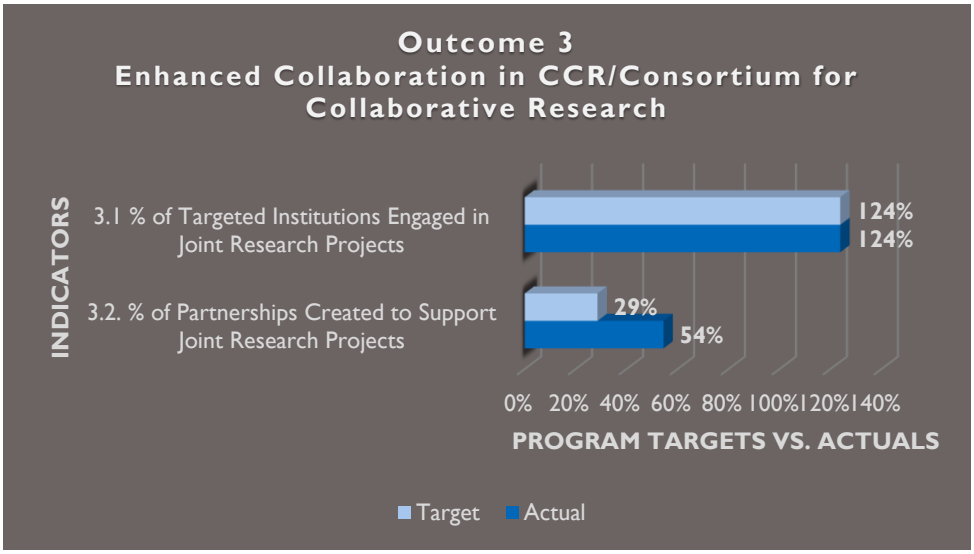

Figure 31: Outcome 3 Program Targets vs. Actuals

For Output Indicator 3.2, the CCRs actively engaged with both the public and private sectors to secure external funding and resources. As the CCRs built more trust amongst themselves and the public and private sectors, these numbers grew over the years. SMART CITY and NCSTT in particular excelled at creating a focused, enhanced approach to sustaining the CCRs' business and research collaboration.

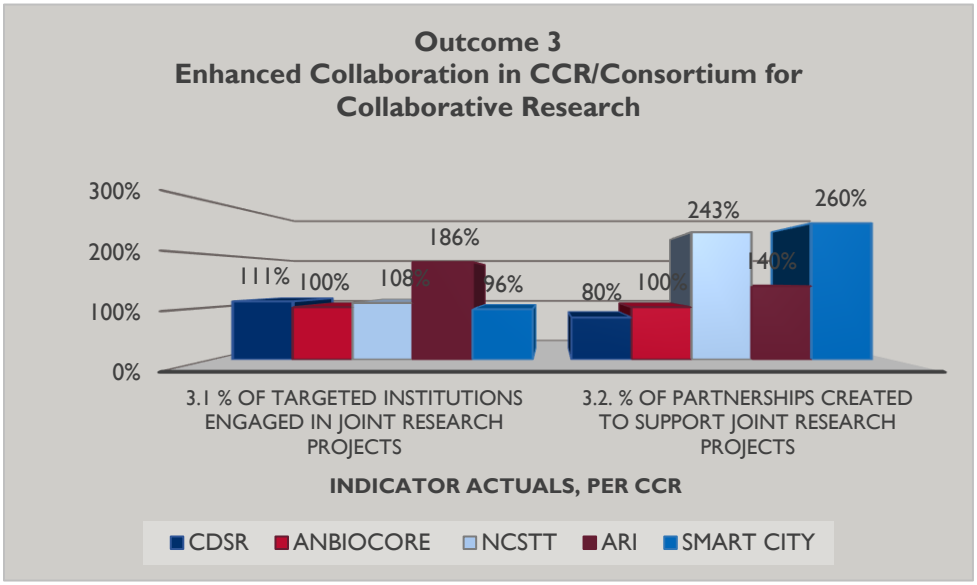

Figure 32: Outcome 3 Indicator Actuals Per CCR

Chapter 4: Challenges & Lessons Learned

I. Reframing the Program Startup Period

IIE understood that given the complexity of the program and the lack of Indonesian HEIs' experience managing USG-funded projects and international consortiums, it would need to provide extensive support to the CCRs during startup and throughout the program. As noted earlier in this report, IIE did just that, providing 146 training sessions and support meetings with the CCRs. However, it found that the time dedicated to capacity building during the first year of implementation needed to be greatly expanded and expectations for immediate program output needed to be adjusted by all program stakeholders.

During the startup period of the program, IIE had to competitively select CCRs, conduct pre-award risk assessments and subaward negotiations, train the CCRs, produce program outputs, and have CCRs spend down program funds. Ultimately, the project's pre-award assessments and subaward negotiations took longer than initially anticipated. SHERA's grants were unique within the context of international partnership funding in Indonesia and this posed a risk for IIE given that it was the first time these institutions would be prime subrecipients on large cost-reimbursable subagreements, in which they would have multiple subrecipients from the U.S. and Indonesia. Each subaward negotiation and execution took between six to nine months and focused on capacity development for creating acceptable program descriptions, target numbers, and budgets. SHERA also worked with each CCR to further explain USG-specific terminology and requirements. IIE feels strongly that this significant level of pre-award work enabled the CCRs to understand the rigorous expectations of managing USG funds and monitoring subrecipients under this subaward and made them better positioned and prepared to apply for a USG contract or cooperative agreement in the future. Additionally, through the process of moving the first several subawards from negotiation to execution, SHERA established its own quality benchmarking regarding an acceptable level of capacity among CCR Leads at the pre-award stage, as opposed to what can be trained post-award. This enabled the project to expedite the process for the remaining subagreements.

In terms of finances, IIE anticipated that all CCR Leads would experience similar operational and management challenges due to fact that they were semi-autonomous, public HEIs that lacked the institutional capacities and policies needed to support the implementation of USG programming, particularly financial systems to track and report on SHERA funds. They also lacked processes and efficient systems for transferring funds internally from the rectorate-level bank account to the CCR-level bank account. This issue was further compounded at the second-tier Indonesian affiliate level, where many of the institutions had no autonomy over their financial management and budgeting systems. IIE addressed many of these challenges during the subaward negotiation process by requiring each CCR to open a sub-account for the sole purpose of holding SHERA funds, implementing an internal accounting system (QuickBooks), and including special award conditions that outlined the necessary back-up documentation for monthly financial reports. It also conducted extensive supplemental capacity building and technical assistance through CCR workshops, one-on-one meetings, follow-up sessions as needed, and brought in the GOI work with the HEIs on settling issues with transferring funds internally.

Given the extensive groundwork that needed to be laid for SHERA to be successful, IIE recommends that a minimum of six months be allocated to institutional and individual capacity building activities before seeking to implement program activities for future projects that are similar in nature. Moreover, all stakeholders need to anticipate that extensive capacity-building support must continue throughout the program as the subrecipients' needs evolve. Below are key subjects that must be addressed during the start-up period, as noted in the SHERA Final Evaluation:

- Clarify expectations for role of Lead, Affiliate, and U.S. partners in designing research
- Discuss and practice financial accountability requirements, as well as basis for disbursing funds
- Develop risk mitigation and crisis management strategies for early termination and other unexpected events
- Provide more mentoring on managing multi-institution consortia
- Provide more mentoring on HEIs working with public and private sector organizations
- Provide more mentoring on developing partnerships with U.S. institutions
- Bring senior executive managers at Lead institutions into the process of improving research policy
- Provide more mentoring on how to manage different policies and procedures across participating institutions
- Provide more mentoring on using IT to enhance communications among members of the CCR
- Provide more mentoring on selecting which research projects to pursue, including how many can be managed and how to find connections among varying research interests
- Provide more and earlier mentoring on sustainability planning for when the original funding ends
- Develop lines of communication with U.S. partners, to discuss program goals and solicit their evaluation of program progress

By addressing these key topics and dedicating time to training and establishing new systems before delving into program implementation, all stakeholders are left in a better position to implement the program.

II. Limitation of Funding

During the first year of program implementation, IIE was unable to fully distribute funds to the CCRs and spend down its obligation due to the extensive amount of training and oversight that it needed to provide before the CCRs could shift into full program implementation. However, by the end of FY2018, the CCRs were fully up and running, with their burn rates increasing. In January 2019, IIE began to experience the strains of limited funding from USAID. At that point, IIE had advanced funds to its subrecipients up to their total level of obligation but IIE could not provide them with additional incremental increases because IIE had yet to receive its own incremental funding increase from USAID.

On June 26, 2019 USAID sent IIE Modification No. 3 to SHERA which provided an incremental funding increase that was intended to support IIE expenses through September 2020, in addition to the five CCRs' programmatic and operational expenses. However, during July 2019 through September 2020 the CCRs were supposed to have been spending at their highest rate to support, their main research activities. Without additional funding, the CCRs were left unable to implement their activities and achieve all their KPI targets.

On March 10, 2020, IIE sent each CCR a formal closeout notification, including a closeout package with the documents that the CCRs were trained on in October 2019. Following IPB and UNPAD's early closure on January 31, 2020, UI and UGM closed their programs under SHERA on June 30, 2020, while IIE later negotiated a July 31, 2020 end date with ITB.

In total, only $9,478,782.84 of the program's original $19,992,812 was obligated to IIE. Yet despite this hurdle, SHERA managed to execute key achievements throughout program implementation and served as an important building block towards creating sustainable research partnerships in higher education in Indonesia.

III. CCR Operational and Program Management Capacity

IIE and the CCRs (per their reporting and verbal feedback) both agree that the most challenging aspect of the SHERA program concerned grant and financial management. This was due to the limited experience and institutional scaffolding the CCR Leads had to properly manage complex USG subawards, institutional barriers, and management and communication issues that exacerbated the program's funding limitations. The following section provides an overview of the challenges and how they were addressed by IIE.

In 2017, IIE established cost-reimbursable subagreements with each CCR Lead. Since the Leads had little to no access to pre-financing, IIE constructed a payment system in which it would advance funds in 60-day installments, plus funds for the month in which the advance request was made. These advance requests were premised on allowable costs for program activities and targets that were in line with the CCRs' annual IP, as well as monthly invoice reconciliation and historical burn rates. It is important to note that the advances were IIE funds, meaning that it did not invoice USAID for these until the CCRs submitted their monthly reconciliations.

Each partner had differences in administrative and operational expectations, standard operating procedures (SOPS), policies, regulations, level of resources, and cultural assumptions. Accounting systems used at the research or faculty-level at Lead HEIs did not allow for tracking or reporting on program-specific funds or tracking different types of expenses, and all Leads used GOI procurement thresholds. IIE had to identify and communicate these differences among stakeholders, while developing grant management mechanisms that supported all partners.

Given the CCR Leads' low level of experience, as well as their lack of institutional control mechanisms (identified in the pre-award risk assessment), IIE instituted tight restrictions and comprehensive oversight during the beginning of the program. This oversight also served to build the capacity of CCR management teams, teaching them SOPs and key USG cost principles. However, this level of oversight also led to increased administrative burden and slowed the CCRs' access to funds and activity implementation.

To address this concern in FY2018, IIE conducted an assessment of its review and approval steps to identify opportunities for increased efficiencies. This included an analysis of each step in the CCR payment process (advance request through reconciliation) and identified the key "pain points" that slowed the review process. As a result, the efficiency of the entire payment process was increased and an additional IIE staff member (Program Finance Specialist) was hired in June 2018 to further support subrecipient financial monitoring in the Home Office, in consultation with the Field Office. In addition to the more streamlined financial processes and templates, IIE also revised its SHERA Grants Manual and subagreement terms to better utilize the Lead institutions' existing policies and processes, where applicable and in compliance with USG regulations. This further increased efficiency and reduced administrative burden on the CCRs.

These improvements to IIE's processes were also coupled with the extensive time and resources it spent working with the CCRs to strengthen their own internal systems. During the beginning of the program, the CCRs faced internal barriers accessing the funds they received from IIE. In response, IIE worked with the CCR Leads to better understand these barriers and met with institutional leadership and representatives from Kemristekdikti to determine possible policy changes or process alterations for accessing and reconciling funds, as some institutions' processes were prohibitively lengthy. As a result, the Ministry agreed to send a letter to each institution's rector noting the challenges and requesting support to address them.

After the above measures and training were conducted, IIE saw significant improvement in the CCRs' understanding and implementation of grant and financial reporting. They became increasingly efficient and produced higher-quality, complete, and timely reporting deliverables. This in turn increased their burn rates and allowed them to access more funds, thereby ramping up program activities and hitting their targets. CCR

management teams also realized that they needed more supporting managing multiple programs at once and brought on additional staff members.

As the CCRs hit their stride and ramped up program activities, the program learned that there would be no additional funding from USAID. Depending on the performance of the respective CCR management teams, some CCRs were able to pivot better than others. Despite the closeout challenges that the program faced in late FY2019 and in FY2020, each CCR did positively transform over the course of the program. Each CCR final report attests to this growth. The next stage for the CCRs is to establish themselves as autonomous units at the universities, while gaining a foothold in university leadership so they have even further buy-in on future projects. That will present its own set of unique challenges, but thanks to the support that SHERA has provided, the CCRs are now in a much better position to move forward.

IV. U.S. HEI Partnerships

Though building U.S.-Indonesia higher education partnerships was a pivotal part of the SHERA program, IIE decided to break tradition from similar research partnership models by making the Indonesian HEIs the prime subrecipients, rather than the U.S. HEI partners. The U.S. HEIs were then subrecipients to the CCR Leads. Within the SHERA model, U.S. HEIs were meant to assume a mentorship, capacity-building role, while also taking an active role in research collaboration and helping the Indonesian HEIs to expand their professional networks in the U.S. and abroad.

Though each CCR Lead had identified its U.S. HEI affiliate partner at the start of the program, it took some time for executed subagreements to materialize, which then delayed the program's partnership award spending. This was due to several reasons. First, IIE could not directly control or intervene in the subagreement negotiation process, given that the subagreement relationships were between the CCR Leads and the U.S. HEIs as subrecipients. Each university had its own procedures and policies for negotiating the terms of the award. In addition to the prime-subrecipient relationship that needed to be respected, the CCRs also asked IIE to limit any direct communication with the U.S. affiliates so the Leads could build strong relationships and communication flows. Third, the CCRs faced uncertainty and confusion as to the choice of funding mechanisms (agreement type), proper templates, scheduling of deliverables and related payments for FAAs, and misunderstanding of indirect rates and costs from U.S. partner universities.

To address these concerns, IIE spent significant time assessing the existing barriers, identifying the best options for providing supplemental support to the CCR leads, and implementing those actions. IIE created and shared templates, tools, and training materials early in the CCR Leads' negotiations with their affiliates. IIE also sent a G&C representative to Indonesia in March 2018 to provide extensive training on the benefits of cost-reimbursable and FAAs and a review of shell agreements for the two funding mechanisms tailored for CCR Leads' use with their affiliates. He also held one-on-one meetings with the CCR Leads to discuss their unique challenges, identify the best type of award for each affiliate, discuss the purpose of NICRAs and the importance in adhering to them during budget negotiations, share best practices on communicating with U.S. institutions' contracting departments, and outlined the steps to subaward execution. As a result, CCRs Leads soon afterwards executed the subagreements. IIE also conducted follow-on trainings that discussed CCR concerns related to U.S. HEI payments (e.g., bank changes, exchange rate fluctuations) and provided further tools for reviewing and tracking subrecipient spending.

Once the executed subagreements were in place, the U.S. HEIs embraced their mentorship role with the Indonesian HEIs. U.S. scholars made 43 visits to partner CCRs (Leads and affiliates), provided ongoing mentorship to 81 Indonesian scholars, inspected research projects, and gave training sessions. Twenty-eight Indonesian scholars also visited their U.S. colleagues for research projects, training, and MOU negotiation. Additional visits to and from Indonesia had been scheduled in FY2020 by the CCRs before the program's funding limitations forced the CCRs to cancel travel plans. The CCRs and individual scholars all noted how beneficial

these relationships with U.S. HEIs were, both at the institutional and individual level. Due to the training the Indonesian scholars received from U.S. HEI partners on academic writing, research protocols, project development, and more, they reported that the quality of their work increased. Furthermore, their impact grew as they were exposed to new networks and international audiences had the opportunity to connect with cutting-edge research that the CCRs were conducting in Indonesia.

However, more comprehensive institutional partnerships between U.S. and Indonesian HEIs did not fully occur within the lifecycle of the SHERA program. As noted in the SHERA Final Evaluation report, "Comprehensive, bi-national partnerships take years to develop." SHERA was no exception Additional time is needed to expand the existing relationships between the CCR partners and transform them into multi-year, transdisciplinary, and multi-level projects with varied funding streams.

Though these partnerships likely would have been in relatively formative stages had the CCRs' subawards run through March 3, 2021, the shortened program timeframe hindered their development. All CCRs reported that they worried the early termination of the program and funding constraints had damaged their credibility and relationships with their U.S. HEI partners.

Despite these challenges, important groundwork has been laid for the development of partnerships with U.S. universities. CDSR, through its U.S. partner UCB, has received NSF funding through 2021, and is working to expand its relationships with Cal Poly and UT Austin, as well as the University of California-Davis. MIT has also charged ITB will managing the MIT-Indonesia Research Alliance in the fields of energy, biotechnology, economics, health, and transportation, beginning in 2021. Thus, the seeds have been planted and the full extent of these partnerships will likely not be realized until many years ahead.

V. COVID-19

During the last half of SHERA'S program implementation in FY2020, the novel virus COVID-19 emerged and the world was forced to shut down in response to the global pandemic. In March 2020, the GOI declared an emergency period with government restrictions put in place on social distancing and stay-at-home orders for many sectors. During this time, the CCR universities shut down, with staff working remotely. IIE also directed its staff members to work remotely.

Despite the sudden shift to full-time remote work, the program was able to quickly pivot to implementing program activities virtually thanks to its adaptive management approach and to the virtual monitoring mechanisms that it had maintained throughout the program. IIE utilized teleconferencing platforms to assist the CCRs in revising their IPs and preparing for program closeout, to collect lessons learned, and to conduct the program's Final Evaluation. IIE also held weekly calls with the USAID AOR. CCR response times to IIE slowed, given that CCR staff were no longer physically in the same office for signatures and some were without their office equipment (e.g. printers). However, IIE worked with the CCRs to find workaround solutions were possible, ensuring that regulations were followed but avoiding any undue administrative burden on the CCRs.

Due to lockdowns in both Indonesia and the U.S., IIE was unable to send Home Office staff to Indonesia to assist with the shutdown of its project office, nor was the program able to host an in-person closeout event with the GOI, USAID, and the CCRs to celebrate the achievements of the program. Despite these hindrances, IIE adapted to the situation and performed its tasks to ensure the program was properly closed.

VI. Private Sector Engagement

Private sector engagement (PSE) was a key component of SHERA's sustainable design, yet the program's reduced level of funding hindered a robust approach and resulted in the cancellation of PSE activities, namely the

2020 Private Sector Investment Summit. This actively had been planned since the inception of the program and was intended to bring together CCRs and industry leaders to showcase the partnerships they had established, in addition to providing opportunities for new partnerships to emerge from the connections established at the event. Once IIE learned in June 2019 that its funding for the program was meant to last through September 2020, it was forced to recalibrate its IP and focus funds on supporting the CCRs through program closeout, rather than expanding its PSE activities as planned. Moreover, with the lack of additional funding in FY2019, CCRs ARI and ANBIOBORE, who had both struggled to cultivate PSE relationships, were not able to execute plans for expanding their PSE.

Despite the challenges that reduced funding presented, IIE should have focused more attention on PSE activities from the start of the program, rather than waiting until the CCRs had stabilized in their program implementation. Though IIE hired a PSE consultant and utilized its Home Office private sector connections in the U.S. to support the CCRs in their PSE plans, the PSE consultant should have been brought on at the start of the program to develop a targeted approach with the program staff. This would have contributed to a more robust, targeted CCR sustainability plan that could be cultivated and expanded throughout the program.

However, a lesson learned for all SHERA stakeholders was that PSE takes a considerable amount of time to develop and implement. Most research cannot be replicated by private sector partners until it is further along in the R&D process, which would beyond the project lifecycle. As such, tangible PSE outcomes such as Goal Indicator 3 (Ratio of academic research initiatives whose findings are utilized to address development challenges) are very difficult to achieve in a limited timeframe, particularly in SHERA's truncated form. SHERA shared these concerns with USAID, particularly when J2SR and the revised CDCS were presented. As noted in IIE's reporting in 2019, SHERA was a research partnership program that needed a significant amount of time to demonstrate lasting results. In order to follow J2SR, the SHERA program and future projects following its model would need to be recalibrated if the program was supposed to show more immediate impact of CCR activities in local communities.

PSE and PPP are key to establishing and cultivating research initiatives that can be used to solve Indonesia's development challenges. Given the considerable time it takes to create and expand such relationships, IIE recommends that the program's focus should be on early and continuous mentoring in creating these linkages. Moreover, in future programming, the government (in this case, the GOI) should be utilized to take a more active role in introducing potential partners and promoting these linkages. Despite these challenges, important PSE connections and activities were generated under SHERA, as exemplified by NCSTT's electric vehicle development for example, and such initiatives will only continue to grow thanks to the strong foundation that the SHERA program established.

VII. Program Sustainability

As noted earlier in this report, MESP conducted a Sustainability Assessment in 2019 which recommended that IIE make sustainability planning an "explicit and regular" part of SHERA implementation and work collaboratively with the GOI, university leadership, and CCR directors to align stakeholder visions. IIE agreed with those findings. Given that those findings were reported in June 2019, the same time that IIE learned it would not be receiving additional funding from USAID, it quickly pivoted towards sustainability planning with the CCRs, holding one-on-one meetings and the October 2019 workshop.

However, by the time the program had to pivot to more robust sustainability planning, the CCRs' collaboration with IIE had greatly diminished due to the program's early closure. Once the CCRs learned about the reduced funding, the CCRs became less communicative and willing to interact with IIE, including on sustainability. The CCRs that created successful plans (CDSR, NCSTT, SMART CITY) were those who had already cultivated strong international partnerships, both within academic and as PPPs. Those whose management teams had

struggled to form cohesive strategies (ANBIOCORE and CCR ARI) closed their programs under SHERA in January 2020, which did not give them time to work with IIE create feasible solutions.

IIE's lesson learned on this front was that it should have included sustainability planning as an active part of its program implementation from the beginning of SHERA. Rather than pivoting to sustainability in Year 4 of the program, it should have been a primary topic from Year 1 onwards. This is not to say that IIE did not discuss and plan for sustainability with the CCRs during the first half of the program. However, alongside its PSE activities and planning, it should have made sustainability a greater focal point.

Finally, the GOI needed to have been actively involved in sustainability planning with IIE and the CCRs from the beginning of the program. The GOI did not clearly articulate its expectations or goals for the future of the CCRs, as well as potential funding mechanisms to sustain their work. In order to create a cohesive strategy that aligned GOI, university, PSE, and CCR priorities, IIE should have brought these stakeholders together at the start of the program and throughout to establish and track sustainability priorities in a more targeted manner.

Despite these lessons learned, key collaboration across all partnerships did occur and the legacy of SHERA is continuing on in different fashions, as described in Chapter II and Annex V of this report. Three of the five CCRs have found external and GOI support to continue their activities in the years ahead. The other two CCRs have taken a different form but their research networks are still actively engaged. Ultimately, the networks that the CCRs built will continue beyond SHERA and there is much to be gained by building even more comprehensive partnerships in the future.

Chapter 5: Program Administration

I. Project Office and Staffing

Project Office

During the project's startup period, IIE's SHERA Field Office worked in a temporary office space from mid-July 2016 through October 2016. Once IIE secured a more permanent lease on October 9th of that year, the team moved into the Menara Imperium building in Jakarta. The project was also able to benefit from the disposition of office furniture from the USAID Higher Education Learning and Management (HELM) program at that time. Due to change in ownership of that space, the SHERA project office later moved from Menara Imperium to Gran Rubina Office Park in October 2018. Once IIE determined that it would be forced to close field operations by September 2020 (see Challenges section above), IIE successfully negotiated its lease from April 30, 2021 to September 30, 2020.

In June 2020, USAID informed IIE that all assets purchased under SHERA must first be reviewed by Kemenristek/BRIN before they could be disposed to other recipients. After presenting IIE's assets, as well as the subrecipients assets purchased under SHERA, the following plan was approved on September 10, 2020:

- All CCR assets to be disposed to their respective CCR Lead (IPB, ITB, UGM, UI, UNPAD)
- The GOI will retain 45 assets
- IIE will retain one external hard drive for data storage and IIEF will retain three assets
- Remaining assets will be disposed to USAID projects (JAPRI, Mitra Kunci, AWARE-3) and Dinas.

In September 2020, IIE disposed all of the above assets to their respective recipient.

Staffing

At the height of the program, IIE maintained a project team of staff based in the Jakarta office. The Field Office staff were supported by IIE's U.S.-based core staff, who provided program oversight and targeted technical and administrative support. IIE Home Office staff also traveled to Indonesia to provide targeted support for its Field Office and subrecipients, while IIE invited key Field Office staff to its U.S.-based offices to provide further training and to introduce the program to external stakeholders.

Indonesian International Education Foundation

IIE's longstanding partner in Indonesia, IIEF, was involved in the SHERA program from the proposal stage onwards. As outlined in Agreement AID-497-A-16-00004, IIEF has served as an implementing for communications and outreach activities. In November 2016, IIE finalized a subagreement with IIEF, which enabled the organization to recruit a USAID SHERA Communications and Outreach Specialist. In this role, the Specialist developed the program's Communications Plan, conducted media outreach, developed SHERA program communications products, led workshops and trainings for the CCRs, and arranged program event logistics, as detailed earlier in this report. This role was active through August 2020.

In February 2019, IIE expanded IIEF's scope to include an Exchange Visitor Consultant. This role was needed to support CCR Indonesian scholars' travel to the U.S. for research and partnership activities with their U.S. affiliates. From February through July 2019, the J-1 specialist aided the scholars' travel to the U.S. under J-1 visas, providing pre-departure and in-country support and monitoring and tracking exchange visitors while in the U.S. and upon return to Indonesia. She also worked with TraiNet, USAID's official training data management system and the entry point for data about training program to prepare DS-2019 documents for participants.

However, in FY2019, IIE received limited funding from USAID which affected the CCRs' activities and forced them to eliminate their visits to U.S. institutions. Thus, the J-1 specialist only worked through July 2019.

In June 2020, IIE made a final modification to its subagreement with IIEF, changing the Period of Performance from February 28, 2021, to July 31, 2020.

II. Program Deliverables and Financial Management

During the lifecycle of the USAID SHERA, IIE submitted all program deliverables outlined in Agreement AID-497-A-16-00004 on time. This includes the quarterly SF-425. Additionally, IIE submitted numerous supplemental reports to USAID throughout the program to both assist USAID in its own reporting requirements and to provide timely programmatic and financial information.

In total, USAID obligated the program $9,478,782.84. The Agreement Ceiling was $19,992,812. SHERA's total expenditures as of FY20 Q4 were $9,381,789, or 98% of its obligation.

Annex 1: SHERA Cumulative Key Performance Indicators- Targets vs. Actuals

Performance Indicators	FY2017		FY2018		FY2019		FY2020		Total Target	Total Achieved
	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
1. Number of peer-reviewed scientific publications[11] resulting from USG support to research and implementation program	0	0	70	51	106	127	80	95	256	**273**
Journal Articles		0		37		66		39		**142**
Proceeding Articles		0		43		182		167		**392**
Status of Scopus										
Indexed Scopus		0		71		230		206		**507**
Non-Indexed Scopus		0		9		18				**27**
2. Ratio of citation to publication produced by Indonesia researchers	0	0%	13%	43%	8%	21%	14%	13%	11%	**21%**
Numerator: Number of Cited Publications	0	0	9	34	8	52	11	24	28	**110**
Denominator: Total Number of Publication	0	0	70	80	106	248	80	189	256	**517**
Journal Articles		0		21		25		13		**59**
Proceeding Articles		0		13		27		11		**51**
Number of Authors:										
Male		0		69		99		24		**192**
Female		0		22		50		10		**82**
3. Ratio of academic research initiatives whose findings are utilized to address development challenges.	0	0%	4%	0%	6%	3%	4%	0%	5%	**3%**
Numerator: Number of Research Initiatives Whose Findings are Utilized		0	3	0	6	2	3	0	12	**2**
Denominator: Number of Research Topics		0	70	77	106	78	80	79	256	**79**

[11] Per the PIRS, the proceeding article has a value of 3 to everyone journal article (3:1). This process aimed at ensuring the quality of the products published.

Performance Indicators	FY2017		FY2018		FY2019		FY2020		Total Target	Total Achieved
	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
Sectors:										
Governments				0		2				**2**
Private Sectors				0		0				**0**
NGO				0		0				**0**
Bilateral organization				0		0				**0**
Types:										
Replicated				0		0				**0**
Taken to the Market				0		0				**0**
Applied				0		2				**2**
1.1 % of scholars who present at conference	0	0%	59%	46%	43%	78%	13.2%	13%	38%	**46%**
Numerator: Number of SHERA scholars who presented at scientific conferences		0%	98	76	82	149	25	25	205	**250**
Denominator: Total Number of SHERA scholars		0	165	166	190	191	190	191	545	**548**
Male		0		52		81		20		**153**
Female				24		68		5		**97**
Age under 25				2		3		2		**7**
Age 25 - 45				50		85		10		**145**
Age 46 - 65				22		50		11		**83**
Age over or equal 66				0		0				**0**
1.1.1. Number of short-term training courses held	5	3	25	29	31	13	0	0	61	**45**
Training		1		20		7		0		**28**
Workshop		2		9		6		0		**17**
Duration (Hrs)		50		892		266		0		**1208**
1.1.2. % of researchers participating in short-term training courses	54%	100%	69%	63%	63%	50%	0%	0%	44%	**60%**

Performance Indicators	FY2017		FY2018		FY2019		FY2020		Total Target	Total Achieved
	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
Numerator: SHERA Scholars	47	80	485	817	485	381	0	0	1017	**1278**
Denominator: Total Number of Participants	87	80	702	1294	769	769	769	0	2327	**2143**
Male		27		407		193				**627**
Female		53		410		188				**651**
Academic Level:										
Master		33		405		208				**646**
Ph.D. Students		18		297		123				**438**
Sp1		16		71		32				**119**
Sp2		8		8		8				**24**
Postdoctoral Students		5		36		10				**51**
1.1.3. Number of U.S. scholars visiting Indonesian institutions to lead short-term training courses for Indonesian partner institutions	3	4	12	16	18	22	0	1	33	**43**
Male		2		16		16				**34**
Female		2				6		1		**9**
Age										
25 - 45				8		4		1		**13**
46 - 65		2		6		9				**17**
up to 66				1		2				**3**
Academic Level:										
Master		1		2		2				**5**
Ph.D. Students		2		7		15				**24**
Postdoctoral Students		1		7		5		1		**14**
Number of visits		4		16		22		1		**43**
1.2 % of scholars who participate in collaborative research	0	40%	75%	76%	72%	113%	3%	4%	50.1%	**64%**

Performance Indicators	FY2017		FY2018		FY2019		FY2020		Total Target	Total Achieved
	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
Numerator: Number of SHERA scholars who work with peers in different institution	0	21	210	267	202	318	9	12	421	**618**
Denominator: Total Number of SHERA scholars	0	52	280	350	280	281	280	281	840	**964**
Male		12		159		188		9		**368**
Female		9		108		130		3		**250**
Age										
<25		5		9		6				**20**
25 - 45		13		154		178		11		**356**
46 - 65		3		79		110		1		**193**
up to 66						3				**3**
1.2.1. Number of Indonesian scholars who participate in in-person faculty exchanges held in the U.S.	0	0	32	10	57	18	0	0	89	**28**
Male				9		9				**18**
Female				1		9				**10**
Age										
25 - 45				3		7				**10**
46 - 65				3		10				**13**
up to 66						1				**1**
Academic Level:										
Master						5				**5**
Ph.D. Students				6		12				**18**
Postdoctoral Students				4		1				**5**
1.2.2. Number of Indonesian scholars who receive ongoing mentoring	0	4	56	28	71	49	0	0	127	**81**
Male		2		12		16				**30**

Performance Indicators	FY2017		FY2018		FY2019		FY2020		Total Target	Total Achieved
	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
Female		2		16		33				**51**
Age										
under 25		1		2		1				**4**
25 - 45		3		19		36				**58**
46 - 65				6		11				**17**
up to 66				1		1				**2**
Academic Level:										
Master		3		23		36				**62**
Ph.D. Students		1		3		11				**15**
Sp1				1		1				**2**
Sp2										
Postdoctoral Students				1		1				**2**
2.1. % of Indonesian institutions with improved research policies and systems in place.	0	0%	38%	67%	52%	13%	17.4%	17%	35%	**28%**
Numerator: Number of CCR institutions which adopted new and/or improved and/or developed research policies and/or systems	0		3	10	12	3	4	4	19	**17**
Denominator: Total number of CCR Indonesian institutions	0		8	15	23	23	23	23	54	**61**
Lead				2		1				**3**
Affiliates				8		2		4		**14**
2.1.1. Number of institutions that develop improved research and management policies developed	0	0	2	9	6	2	4	4	12	**15**
Lead				1		1				**2**
Affiliates				8		1		4		**13**

Performance Indicators	FY2017		FY2018		FY2019		FY2020		Total Target	Total Achieved
	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
2.2. % of CCR members with improved administrative and management systems in place.	0	25%	60%	27%	59%	24%	13.6%	14%	42%	**21%**
Numerator: Number of CCR institutions which adopted new and/or improved and/or developed administrative and/or management system		1	9	4	13	5	3	3	25	**13**
Denominator: Total number of CCR Indonesian institutions		4	15	15	22	21	22	21	59	**61**
Lead		1		3		2				**6**
Affiliates				1		3		3		**7**
Gender (Y/N)				2		1				**3**
2.2.1. Number of CCR websites that are developed, operational and used regularly	0		5	5	5	5	5	5	5	**5**
2.2.2. Number of CCR knowledge products created	0	0	57	236	96	195	8	100	161	**531**
Number of Products that have Gender Sensitive				17		18		6		**41**
Number of Patent						1		2		**3**
Number of Guide or SOP				3		3				**6**
Number of Book				86		2		1		**89**
Number of Modul				2		4				**6**
Number of Research Report				25		27		13		**65**
Number of Proceeding				38		56		67		**161**
Number of Paper				23		50		12		**85**
Number of Presentation Material						22				**22**
Number of Infographic				6						**6**
Number of Poster				17		12				**29**
Number of Factsheet or Flyer				1						**1**

Performance Indicators	FY2017		FY2018		FY2019		FY2020		Total Target	Total Achieved
	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
Number of Bulletin				2						**2**
Number of Video				19		8		3		**30**
Number of Booklet				14		9		1		**24**
Number of Prototype								1		**1**
Number of Policy Briefs						1				**1**
Number of Others										**0**
2.2.3. Number of CCR knowledge sharing events held on best-practices & lessons learned	0		14	31	14	24	5	5	33	**60**
2.2.4. Number of people participated in activities addressing gender equality or female empowerment in science and technology research.	0		0	282	100	81	146	146	246	**509**
Male				74		52		32		**158**
Female				208		29		114		**351**
3.1 % of targeted institutions engaged in joint research projects	100%	0%	100%	110%	100%	119%	124%	124%	124%	**124%**
Numerator: Number of institutions that have engaged in joint research activities	5	4	41	45	42	50	52	52	52	**52**
Denominator: Total number of CCR institutions	5	6	41	41	42	42	42	42	42	**42**
In-country Based		3		37		40		40		**120**
US based		1		8		10		12		**31**
Third country based										**0**
Type of institution										
Academic		3		41		43		45		**132**
Private Sectors										**0**

Performance Indicators	FY2017		FY2018		FY2019		FY2020		Total Target	Total Achieved
	Target	Actual	Target	Actual	Target	Actual	Target	Actual		
Public Sectors		1		4		7		7		**19**
3.1.2. Number of scholars at CCR institutions with increased access to external research resources and academic research engines.	0	0	78	189	137	54	146	0	361	**243**
3.2. % of Partnerships Created to Support Joint Research Projects	0		30%	97%	41%	63%	15%	3%	29%	**54%**
Numerator: Number of partnerships created by Indonesian CCR institutions			9	29	11	19	4	1	24	**49**
Denominator: Total number of Indonesian CCR institutions			30	30	27	30	27	30	84	**90**
Lead				19		12		1		**32**
Affiliates				10		7				**17**

Annex II: SHERA FY2020 Annual Report[12]

Over the course of FY2020, IIE shifted from supporting CCR activity implementation to implementing program closeout procedures. Once USAID informed IIE in October 2019 that it could not provide additional funding in FY2020, IIE began working directly with the CCRs on subrecipient closeout processes, documentation, and sustainability planning.

On October 23-25, 2019, IIE conducted a Subrecipient Closeout Procedures and CCR Sustainability Workshop for all five CCRs in Bandung. This participatory workshop was designed to address the immediate needs of CCRs ARI and ANBIOBORE, who were closing in January 2020, while also ensuring that the same information reached the remaining three CCRs who would close later in the fiscal year. The timing of the workshop gave CCRs ARI and ANBIOCORE the information they needed to close out their subagreements with IIE and gave CCRs NCSTT, SMART CITY, and CDSR the opportunity to be proactive in their planning. In addition to closeout procedures, the workshop spent time on sustainability planning. It created a space for the CCRs, university leadership, IIE, GOI, and USAID to opening discuss the program's limited funding. The objectives of the workshop were as follows:

- To provide the CCRs with an overview of standard USG-funded subrecipient closeout procedures.
- To introduce closeout timelines and define roles/expectations for the CCRs and their respective universities.
- To review, discuss, and practice the proper completion of closeout documentation.
- To review each CCR's sustainability plans and identify potential implementation challenges.
- To strategize new opportunities for sustainability and enhance current CCR sustainability plans.

During the second day of the workshop, the USAID AOR attended to hear the CCR's sustainability planning strategies and present further information on the limited funding situation. GOI representatives Hali Aprimadya, RISTEKDIKTI Section Head; UNPAD's Vice Rector Dr. Keri Lestari; and IPB's Dean of Husbandry Prof. Srihadi Agungpriyono, Ph.D., were also present. In concluding the workshop, IIE asked each CCR to resubmit its annual Implementation Plan to include clear plans for sustainability activities. IIE also shifted its support focus from capacity building efforts to an emphasis on networking support and showcasing the impact of each CCR.

Once USAID formally communicated to IIE in February 2020 that there would be no further funding provided to the program, IIE pivoted to modifying its subagreements with the CCR Leads, modifying its own IP and MEL Plan, and creating a detail closeout workplan. IIE closed its subagreements with IPB and UNPAD on January 31, 2020; UGM and UI on June 30, 2020; and ITB on July 31, 2020. Its Field Office closed on September 30, 2020.

IIE also supported the program's Final Evaluation and created knowledge products to support USAID's handover of the program to Kemenristek/BRIN IIE managed the closure of its SHERA field office in Jakarta, disposition of office supplies to Kemenristek/BRIN and other stakeholders, and managed local staff departures including the Project Director and Finance Manager prior to the closure of the Jakarta office..

IIE Home Office's USAID Programs Director and Senior Grants Manager continue to support the SHERA program through the end of Cooperative Agreement No: AID-497-A-16-00004. Below are two tables which summarize SHERA's Year Four achievements and closeout activities:

[12] Per the USAID Agreement Officer's letter to IIE, dated August 12, 2020, USAID approved IIE's request to combine the FY2020 Annual Report with the program's final report and provide program achievements specific to FY2020. This section summarizes both IIE program activities and program achievements. Further details on each activity can be found in IIE's quarterly reports to USAID for FY2020.

Table 9: SHERA Year Four Achievements and Activities

DESCRIPTION	SHERA YEAR FOUR IMPLEMENTATION PLAN ACHIEVEMENT		NOTES
I. OPERATIONS & ADMINISTRATION			
I.I	**Administrative Deliverable Requirements**		
I.I.I	Submit Quarterly Performance Reports	✓	30 days after the close of the reporting period
I.I.2	Submit Quarterly Financial Reports	✓	30 days after the close of the reporting period
I.I.3	Submit Annual Performance Report	✓	On 90 days after the USG FY close
I.I.4	Submit Annual Reporting on Foreign Taxes	✓	Due April 15, 2020
I.I.5	Submit Annual Reporting on Assets Management	✓	
I.I.6	Submit property disposition plan to USAID for approval	✓	Disposition plan was approved in several iterations as USAID, GOI, and IIE coordinated on the plan. Final disposition plan was approved by USAID on September 30, 2020.
I.I.7	Submit Final Report	N/A	Due 90 days after agreement date (May 4, 2021). Submitted in FY21 (December 23, 2020)
II. PROGRAM ACTIVITIES			
II.I	**Planning, Programming, and Coordination**		
II.I.I	Monthly USAID - IIE meetings	✓	Includes meetings in October 2019 and March 2020 to review and revise program's PIRS
II.I.2	SHERA Annual Work Planning	✓	Submitted and approved by USAID. Revised IP approved March 2020.
III.I.3	Lead CCR Strategic Meeting	✓	Held October 2019 in Bandung with representatives from all five CCRs, university leadership, GOI, and USAID. Covered subrecipient closeout procedures and sustainability planning.
II.I.4	MIS Transfer Meeting with GOI	✓	Presented to Kemenristek/BRIN on August 27, 2020.
II.I.5	CCR Closeout Meetings	✓	IIE was unable to conduct formal closeout meetings with the CCR Leads and affiliates due to COVID-19 but hosted individual meetings with each CCR and the USAID AOR
II.I.6	SHERA Closeout Meeting	N/A	GOI and USAID decided to cancel the formal closeout meeting with CCRs.
II.I.7	SHERA Program Closure	✓	Field Office closed September 30, 2020 and program activities.
III. CCR PROGRAM IMPLEMENTATION			
III.I	**Grants Management**		
III.I.I	Direct Mentoring to CCRs	✓	In person meetings
III.I.2	Virtual Mentoring to CCRs	✓	Phone Call, Skype Call, GoToMeeting

DESCRIPTION	SHERA YEAR FOUR IMPLEMENTATION PLAN ACHIEVEMENT		NOTES
III.2	**Monitoring, Evaluation, and Learning**		
III.2.1	Virtual Mentoring to CCRs		In person meeting, Phone Call, Skype Call, GoToMeeting
III.2.2	SHERA Final Evaluation	✓	Conducted March-August 2020. Approved by USAID September 7, 2020.
III.2.3	MIS Maintenance / Google Storage Management	✓	Google storage management was ongoing through August 2020. MIS maintenance ended May 2020 with departure of MIS staff member but access to system still active.
III.3	**Communications and Outreach**		
III.3. 1	Website Maintenance and Media Coverage	✓	Media coverage and website maintained through August 2020. Website deactivated at that time due to program closure.
III.3.2	Knowledge Product Development and Dissemination	✓	Developed SHERA for USAID's handover to GOI. Booklet finalized and shared with USAID on September 21, 2020.
III.3.3	CCR Success Story Collection	✓	Managed regularly by Communication Specialist through August 2020
III.3.4	Media Site Visits	✓	Conducted during first half of FY20. Cancelled after March 2020 due to COVID-19.

Table 10: IIE FY20 Closeout Activities

IIE Closeout Activities	Completed
Notified CCRs and IIEF of USAID notice of no additional funding for SHERA	Feb. 2020
Sent SHERA revised IP, revised MEL Plan, and revised budget to USAID for review and approval	Feb. 2020
Requested and reviewed revised CCR IPs, shared with USAID once finalized	Feb.- April 2020
Notified stakeholders of program end date	March 2020
Sent subagreement modifications to CCRs (ITB, UGM, UI) and IIEF	March 2020
Communications & Outreach- Collected CCR success stories	March-August 2020
Conducted MEL Final Evaluation	March-June 2020
Submitted Final Evaluation report to USAID, revised report with USAID feedback	July-August 2020
Submitted Final Evaluation Two-Pager to USAID	September 2020
Conducted CCR Closeout Meetings (UI, ITB and UGM)	April- May 2020
Reconciled all CCR expenses, make final payments, ensure all deliverables are submitted	April-July 2020
Negotiated subagreement modification terms with ITB, final payments made to ITB in October 2020 (FY21)	March-September 2020
Conducted audit and close out of administrative files. Sent hard copies to IIE/DC	August-Sept. 2020
Performed physical inventory check. Developed and submitted property disposition plan to USAID	June- September 2020
Disposed inventory to recipients upon USAID approval	September 2020
Held IIE-USAID Closeout meeting with AOR and HCP Director	September 2020
Closed IIE's SHERA Field Office in Jakarta	September 30, 2020

In regard to FY2020 CCR activities and KPI achievements, the CCRs were forced to cancel most planned activities in FY2020 due to the program's limited funds and early closure. Accordingly, the program's KPI achievements were also limited. To address this issue, IIE and USAID agreed to adjust the targets in the program's MEL plan and indicate which targets not met due to the program's closure. This was noted in the March 2020 revised MEL plan that USAID approved. Though SHERA met most of its program targets, its targets for FY2020 were most severely impacted by the program closure, as seen in Table 12 of this report.

However, thanks to the CCRs' continued efforts and collaboration with IIE, key activities and achievements did occur. The following highlights CCR activities and program achievements in FY2020[13]

- 95 peer-reviewed scientific publications produced, all Scopus-indexed, exceeding the annual target of 80.
- 25 SHERA scholars presented at international conferences (13% of SHERA scholars)
- 146 people participated in activities addressing gender equality or female empowerment in S&T research
- 124% of targeted institutions engaged in joint research projects

ANBIOCORE

On December 19-20, 2019, ANBIOCORE hosted a two-part event at IPB that was attended by all of its affiliate universities in Indonesia. The first half of the event was a meeting to discuss the impact of ANBIOCORE and its future, while the second part was a talk show entitled, 'Women in Research and Innovation.' The talk show was designed to highlight women's role and contribution to science technology and community.

All affiliate universities and institutions had an opportunity to share their research results, activities, and achievements from three years of program implementation. They also discussed potential activities and partnerships following the closure of ANBIOCORE under SHERA in January 2020. One proposed activity was the production of policy briefs for the GOI based on ANBIOCORE's research results. The talk show portion of the event, which featured a panel of women discussing and answering questions about their experience in science and technology, was also attended by IPB students and lecturers. Further information on this event is included in Chapter Two of this report.

CCR ARI

On February 14, 2020, CCR ARI hosted a close out meeting at UNPAD's main campus in Bandung. The meeting was attended by UNPAD's affiliates, institutional partners, SHERA representatives, UNPAD's Dean of the Medical Faculty, and the USAID AOR. The goal of the meeting was to share lessons learned from all affiliates and to mark the end of the formal partnership between CCR ARI and the USAID SHERA program, which concluded on January 31, 2020. During the event, the Dean of the University of Pattimura thanked the USAID SHERA program for providing her university, a remote university in eastern Indonesia, with the opportunity to collaborate with other universities like UNPAD and UCD. She also noted that

Figure 33: USAID SHERA Program Direction Prima Setiawan (second from left) handing over documents to UNPAD's Dean of the Faculty of Medicine, Dr. Setiawan, at the closing ceremony

[13] CCR sustainability plans are included in Chapter Two: University Partnerships of this report.

thanks to the operational management training her university received from the USAID SHERA team, they now have confidence in dealing with higher-level universities and the local government.

In addition to sharing lessons learned, UNPAD and its affiliates discussed potential activities and partnerships after closing out CCR ARI. They agreed to continue their research on respiratory infections by utilizing specimens and samples, particularly for research on COVID-19. To address the issue of funding, CCR ARI applied for and received support from the WHO's Collaborating Center for Reference and Research on Influenza. This support will provide them with the proper storage to maintain their specimens. UNPAD's Faculty of Medicine is also supporting the sustainability of the research by providing additional funding of IDR 200 million, or an estimated $15,000.

SMART CITY

SMART CITY made important strides in establishing and expanding its partnerships and funding sources in FY2020, particularly while planning for its third international conference, ICSCI 2020. The ICSCI is an annual conference hosted by SMART CITY where scholars and researchers from the US, Australia, Germany, Indonesia, and more join to present their work on Smart City innovations. In February 2020, SMART CITY won a funding competition hosted by the Association of Southeast Asian Nations (ASEAN) University Network for its conference. With this additional funding support, SMART CITY was able to host the conference in conjunction with the ASEAN Regional Conference on Energy and Engineering, as well as the following partners: USAID Long-Term Assistance and Services for Research (LASER) Partners for University-Led Solutions Engine (PULSE) at Purdue University; UI's Department of Architecture's annual iDwell conference; and, the ETH-Singapore Future Cities Laboratory. As part of UNUD's final milestone under its Fixed Amount Award with UI, UNUD led the conference paper selection process in April 2020. In the end, over 113 papers were peer-reviewed and accepted for presentation at the ICSCI 2020 conference. Due to COVID-19 travel restrictions and public health concerns, the conference was reformatted for online participation in October 2020.

Another noteworthy achievement was UNUD's establishment of a research unit with an official legal basis under the Vice Rector Prof. Dr. Ir. I Nyoman Gede Antara, M.Eng. (UNUD's previous SMART CITY manager). Scholars from the architecture and urbanism faculty at UNUD had a goal of establishing an independent research unit at the university with an urban development focus; however, the university's partnership with SMART CITY and funding from the USAID SHERA program helped UNUD's faculty realize that goal. The research unit organized ICSCI 2020 and plans to continue its to collaboration with SMART CITY long after the USAID SHERA program ends.

CDSR

In February 2020, UGM signed new Memorandums of Understanding (MOUs) with two U.S. HEIs: The University of Texas at Austin and California Polytechnic State University. The MOU were executed in February 2020 and are designed to institute academic exchanges (both staff and students) between UGM and the U.S. HEIs and to promote research collaboration on CDSR's cross-disciplinary research topics. These partnerships will allow the CDSR to enlarge its network and further sustain its work beyond the SHERA program.

That same month, CDSR also hosted a training on Biorefinery Microalgae and Monitoring Photovoltaic at its affiliate institution, Universitas Bangka Belitung (UBB). The main purpose of this training was to replicate the microalgae park that had been developed in Yogyakarta and to train UBB's researchers on how to cultivate a system of microalgae. This built on CDSR's work from the past several years, as researchers from UGM, ITB, IPB, and UBB had conducted a feasibility study on the development of a microalgae system, in addition to mapping the socioeconomic condition and diversity of biomass in Semujur Island, Bangka Belitung. Dr. Eko Agus Suyono, a microalgae expert from UGM, led the training for three UBB researchers. This training aimed to teach the UBB researchers how to replicate the microalgae park previously developed by UGM. Due to limited equipment and time, this initial training was conducted in a laboratory but UBB's researchers plan to implement

and replicate the system in Semujur Island, Bangka Belitung once COVID-19 restrictions are lifted. CDSR's overarching goal is to develop the microalgae park into a learning center that also acts as a source of renewable energy for the community.

CDSR also began looking beyond USAID SHERA funding to support the long-term sustainability of this activity on Semujur Island. In March 2020, Kemristek announced that three out of five proposals from CDSR were selected to receive funding for a three-year period. Kemristek will disperse IDR 230 million for each proposal per year. This will directly support CDSR's research on the development of the microalgae park in Semujur Island, the supply chain of a photovoltaic system, and the development of an inverter production unit for photovoltaic systems. With this funding from the GOI, UGM will still be able to lead its research initiatives in collaboration with UBB and IPB. During that same month, CDSR affiliates also signed an agreement with the local government of Gorontalo Province which will support research collaboration on renewal energy between the local government of Gorontalo Province, the district government of Bone Bolango, Universitas Muhammadiyah Gorontalo, Universitas Gorontalo and Universitas Negeri Gorontalo. Due to the success of CDSR's partnerships, local government entities wish to replicate those successes on a local scale by involving the above universities and UGM.

NCSTT

NCSTT's key program activity in FY2020 was hosting the 6th ICEVT in Bali on November 18 – 21, 2019. This was the second year in a row NCSTT had hosted the conference. This event was also part of the 2019 Automotive Engineering Week, which consisted of the 11th ASEAN Automobile Safety Forum, 4th International Conference of Sustainable Mobility, and Stop the Crash 2019. Eighty-five speakers from twelve different countries presented at the conference and 200 participants attended. The conference provided opportunities for delegates in the field of Electric Vehicle technology to exchange new ideas and application experiences, as well as to establish networks among peers for future global collaboration. It also gave NCSTT scholars an opportunity to publish their work. All accepted and presented papers from this conference were forwarded for publication consideration in the IEEE Xplore Digital Library and select papers were also forwarded to the International Journal of Sustainable Transportation Technology for consideration. Finally, NCSTT successfully launched its e-trike prototype at the ICEVT 2019, which unveiled NCSTT's work to the broader public. Further details on this achievement are provided in Annex V: SHERA Success Stories.

Figure 34: Distinguished guests and NCSTT leadership (middle) with SHERA PD (left) and USAID AOR (right) at the ICEVT 2019 opening ceremony

Table 12: SHERA FY20 KPIs- CCR Actuals and Program Targets vs. Actuals

FY2020 Performance Indicators	CDSR	ANBIOCORE	NCSTT	ARI	SMART CITY	Program	
	Actuals					Target	Actual
1. Number of peer-reviewed scientific publications resulting from USG support to research and implementation program	20	1	31	0	43	80	95
Journal Articles	5	1	9	0	24		39
Proceeding Articles	44	0	67	0	56		167
Status of Scopus							
Indexed Scopus	49	1	76	0	80		206
Non-Indexed Scopus	0	0	0	0	0		0
2. Ratio of citation to publication produced by Indonesia researchers	12%	0%	3%	0%	20%	14%	13%
Numerator: Number of Cited Publications	6	0	2	0	16	11	24
Denominator: Total Number of Publication	49	1	76	0	80	80	189
Journal Articles	1	0	2		10		13
Proceeding Articles	5	0	0		6		11
Number of Authors:							
Male	10		2		12		24
Female	4		0		6		10
3. Ratio of academic research initiatives whose findings are utilized to address development challenges.	0%	0%	0%	0%	0%	4%	0%
Numerator: Number of Research Initiatives Whose Findings are Utilized	0	0	0	0	0	3	0
Denominator: Number of Research Topics	30	6	12	10	21	80	79
Improved capacity of faculty, PhD students and postdoctoral researchers in target Indonesian universities							
1.1 % of scholars who present at conference	0%	83%	31%	0%	0%	13%	13%
Numerator: Number of SHERA scholars who presented at scientific conferences	0	10	15	0	0	25	25

FY2020 Performance Indicators	CDSR	ANBIOCORE	NCSTT	ARI	SMART CITY	Program	
	Actuals					Target	Actual
Denominator: Total Number of SHERA scholars	75	12	49	25	30	191	191
Male		7	13				20
Female		3	2				5
Age under 25		2	0				2
Age 25 - 45		4	6				10
Age 46 - 65		4	7				11
Age over or equal 66		0	0				0
1.1.1. Number of short-term training courses held	0	0	0	0	0	0	**0**
1.1.2. % of researchers participating in short-term training courses	0%	0%	0%	0%	0%	0%	**0%**
Numerator: SHERA Scholars	0	0	0	0	0	0	0
Denominator: Total Number of Participants	120	240	120	189	100	769	0
1.1.3. Number of U.S. scholars visiting Indonesian institutions to lead short-term training courses for Indonesian partner institutions	0	0	1	0	0	0	**1**
Male							
Female			1				1
Age							
25 - 45			1				1
46 - 65							
up to 66							
Academic Level:							
Master							
Ph.D. Students							
Postdoctoral Students							
Number of visits			1				1
1.2 % of scholars who participate in collaborative research	15%	0%	3%	0%	0%	3%	**4%**
Numerator: Number of SHERA scholars who work with peers in different institution	9	0	3	0	0	9	12

FY2020 Performance Indicators	CDSR	ANBIOC ORE	NCSTT	ARI	SMART CITY	Program	
	Actuals					Target	Actual
Denominator: Total Number of SHERA scholars	62	54	97	65	18	280	296
Male	6	0	3	0	0		9
Female	3	0	0	0	0		3
1.2.1. Number of Indonesian scholars who participate in in-person faculty exchanges held in the U.S.	0	0	0	0	0	0	**0**
1.2.2. Number of Indonesian scholars who receive ongoing mentoring	0	0	0	0	0	0	**0**
Strengthened, inclusive institutional environment for research and management in target Indonesian universities							
2.1. % of Indonesian institutions with improved research policies and systems in place.	0%	400%	0%	0%	0%	17%	**17%**
Numerator: Number of CCR institutions which adopted new and/or improved and/or developed research policies and/or systems	0	4	0	0	0	4	4
Denominator: Total number of CCR Indonesian institutions	7	1	7	1	5	23	23
Lead	0	0	0	0	0		
Affiliates	0	4	0	0	0		
2.1.1. Number of institutions that develop improved research and management policies developed	0	4	0	0	0	4	**4**
Lead	0	0	0	0	0		0
Affiliates	0	4	0	0	0		4
2.2. % of CCR members with improved administrative and management systems in place.	0%	150%	14%	0%	0%	13.6%	**15%**
Numerator: Number of CCR institutions which adopted new and/or improved and/or developed administrative and/or management system	0	3	1	0	0	3	3
Denominator: Total number of CCR Indonesian institutions	4	2	7	2	5	22	20
Lead	0	0	1	0	0		1
Affiliates	0	3	0	0	0		3
Gender (Y/N)	0	8	0	0	0		8

FY2020 Performance Indicators	CDSR	ANBIOCORE	NCSTT	ARI	SMART CITY	Program	
	Actuals					Target	Actual
2.2.1. Number of CCR websites that are developed, operational and used regularly	1	1	1	1	1	5	5
2.2.2. Number of CCR knowledge products created	11	0	84	0	5	8	100
Gender (Issues)	5	0	1	0	0		6
IEC Materials	2	0	2	0	0		4
Modules	0	0	0	0	0		0
Presentation Materials	0	0	0	0	0		0
Papers	0	0	12	0	0		12
Book	1	0	0	0	0		1
Patent	0	0	0	0	2		2
Policy Brief				0	0		0
Guide/SOP		0	0	0			0
Proceeding Articles		0	67	0			67
Prototype			1	0			1
Research Report	8	0	2	0	3		13
2.2.3. Number of CCR knowledge sharing events held on best-practices & lessons learned	1	0	1	0	3	5	5
2.2.4. Number of people participated in activities addressing gender equality or female empowerment in science and technology research.	0	146	0	0	0	146	146
Male	0	32	0	0	0		32
Female	0	114	0	0	0		114
Enhanced collaboration in CCR/Consortium for collaborative research							
3.1 % of targeted institutions engaged in joint research projects	122%	100%	113%	217%	100%	124%	124%
Numerator: Number of institutions that have engaged in joint research activities	11	10	9	13	9	52	52
Denominator: Total number of CCR institutions	9	10	8	6	9	42	42
In-country Based	8	8	7	12	5		40

FY2020 Performance Indicators	CDSR	ANBIOCORE	NCSTT	ARI	SMART CITY	Program	
	Actuals					Target	Actual
US based	3	2	2	1	4		12
Third country based							
Type of institution							
Academic	11	10	9	6	9		45
Private Sectors	0	0	0	7	0		
Public Sectors	0	0	0	0	0		7
3.1.2. Number of scholars at CCR institutions with increased access to external research resources and academic research engines.	0	0	0	0	0	146	**0**
3.2. % of Partnerships Created to Support Joint Research Projects	20%	0%	0%	0%	0%	15%	**3%**
Numerator: Number of partnerships created by Indonesian CCR institutions	1	0	0	0	0	4	1
Denominator: Total number of Indonesian CCR institutions	5	8	7	5	5	27	30
Lead	1	0	0	0	0		1
Affiliates	0	0	0	0	0		0

Annex III: CCR Partnerships

CCR Name	Lead	HEI Partners (Affiliates)	Public-Private Partnerships
CCR on Acute Respiratory Infections	Universitas Padjadjaran	US partner: • University of Colorado, Denver Indonesian partners: • Universitas Syiah Kuala • Universitas Lambung Mangkurat • Universitas Mataram • Universitas Pattimura	• 12 hospitals • 1 pharmaceutical company
Scientific Modeling, Application, Research, and Training for City Centered Innovation and Technology	Universitas Indonesia	US partners: • University of Illinois, Champaign-Urban • University of Florida • Savannah State University • Alabama A&M University Indonesian partners: • Universitas Diponegoro • Universitas Padjadjaran • Universitas Sriwijaya • Universitas Udayana • Universitas Teknologi Sumbawa • Poltekes III Jakarta • Universitas Andalas • 19 Universitas PGRI	• PT Telkom • PT Mass Rapid Transit Jakarta • Pemerintah Kota Depok • National Ministry of Internal Affairs (Kemendagri) • 4 Agencies for Planning & Develop for Depok, Serang, Sukabumi, & Bandung
Center for the Development of a Sustainable Region	Universitas Gadjah Mada	US partner: • University of Colorado, Boulder • University of Texas, Austin • California Polytechnic University Indonesian partners: • Universitas Indonesia • Institut Teknologi Bandung • Institut Pertanian Bogor • Universitas Bangka Belitung • Universitas Muhammadiyah Gorontalo • Universitas Negeri Gorontalo • Institute Teknik Surabaya	• 6 local agencies in Province of Bangka Belitung • PT Korintiga Hutani • Shimizu Corporation • Government of Gorontalo Region

CCR Name	Lead	HEI Partners (Affiliates)	Public-Private Partnerships
National Center for Sustainable Transportation Technology	Institut Teknologi Bandung	US partner: • Massachusetts Institute of Technology • Temple University Indonesian partners: • Universitas Diponegoro • Universitas Sriwijaya • Universitas Lambung Mangkurat • Universitas Sam Ratulangi • Institut Teknologi Kalimantan • Universitas Negeri Sebelas Maret (UNS)	• Ministry of Transportation of Indonesia • PT Bakrie & Brothers • BPPT (Agency for Assessment and Implementation of Technology) • PT PLN (State Electricity Company) • Palembang Department of Transportation • Jakarta Rapid Mass Transit Corporation
CCR on Animal Biotechnology and Coral Reef Fisheries (ANBIOCORE)	Institut Pertanian Bogor	US partners: • University of Rhode Island • Mississippi State University Indonesian partners: • Universitas Papua • Universitas Syiah Kuala • Universitas Padjadjaran • Universitas Brawijaya, • Universitas Udayana • Universitas Mataram • Universitas Nusa Cendana • Universitas Madura	• BET (Livestock Embryo Center) Cipelang Bogor • BIB (Artificial Insemination Center) Lembang Bandung • BBIB (Artificial Insemination Center) Singosari Malang • Lolitsapi (Cattle Research Center) Grati-Pasuruan • BTPU HTP (Livestock Breeding Center) Indrapuri

Annex IV: SHERA Final Evaluation

Below are key takeaways from the SHERA Final Evaluation conducted by Dr. Susan Buck Sutton in coordination with IIE. For the full version of the report, please see the copy available on the USAID Development Experience Clearinghouse website.

The SHERA Approach

The USAID-sponsored SHERA program successfully enhanced the S&T research profile of over 30 HEIs in Indonesia. Through domestic and international collaboration, the program produced immediate, world-class research on high-priority topics that address Indonesia's development challenges, while also building the HEIs' capacity to continue such work into the future. SHERA's approach of giving primary program management responsibilities to Indonesian HEIs was key to its success. SHERA assembled a broad set of Indonesian and U.S. HEIs (as well as various public/private entities) that spanned regions and institutional types and tapped the unused research potential of lesser-known institutions, women scholars, and the country as a whole. This approach enabled SHERA not only to produce remarkable immediate research, but also to build future research capacity on a national scale - creating a feedback loop between training, infrastructural development, and network building on the one hand, and real-time research and publication, on the other.

> *"INDONESIA'S STELLAR PERFORMANCE IN THIS YEAR'S TIMES HIGHER EDUCATION IMPACT RANKINGS REFLECTS THE BURGEONING CAPABILITY OF THE ARCHIPELAGO'S TOP INSTITUTIONS … CLAIMING THREE TOP 100 SPOTS IN ANY GLOBAL RANKING – AND A HANDFUL OF TOP 40 ENTRIES IN KEY AREAS – IS UNHEARD OF FOR INDONESIA … JAPAN IS THE ONLY ASIAN COUNTRY TO MATCH INDONESIA'S EFFORTS IN THE IMPACT RANKINGS."*
>
> - John Ross Times Higher Education May 18, 2020 (a conclusion based in part on the work done by SHERA)

Significant Research Completed

- 534 research publications, 94% in Scopus-indexed outlets
- 64% of CCR scholars participated in this research (represented across all Indonesian HEI members)
- 250 scholars gave conference presentations

Capacity Enhanced and Expanded Across the Archipelago

- 146 trainings on research protocols, grant and financial management (attended by 600 Indonesian scholars each year)
- Effective continuous monitoring, evaluation, and learning (MEL) system developed and promulgated
- 28 Indonesian scholars visited U.S. partners; 43 U.S. scholars traveled to Indonesia
- 81 Indonesian scholars received on-going mentoring from U.S. scholars
- 531 research reports, training modules, guidelines, and other educational materials produced
- Roughly one-quarter of participating HEIs reported improved research policies and management systems
- Percentage of female participation in SHERA at or above their representation in S&T fields in Indonesia.

The Future

SHERA's work will go on in various ways. Some CCRs will continue; some will transition to new formats. In both cases, the research already completed will be put to use, and the capacity and networks that have been built will foster new discoveries. Use of the ARI's COVID-19 application to assess the pandemic in Bandung and West Java; adoption of CDSR's sustainable energy methodology by the United Nations Development Program (UNDP) in Bali, East Nusa Tenggara, and Southeast Sulawesi; and the Ministry of Internal Affairs' plan to use SMART CITY's instrument to assess regional government readiness give strong indication of what is to come.

Annex V: SHERA Success Stories

Sustainable Higher Education Research Alliances

Local Researchers Break Barriers through USAID SHERA Support

Two UNSYIAH researchers in Aceh, Dr. Gholib (S.Pt., M.Si) and Dr. drh Al Azhar (M. Kes.), found themselves in a cycle. They wrote academic papers exploring their research on Aceh cattle, which they submitted numerous times to accredited journals, only to be rejected for publication. Then there was the matter of funding, as their university had limited resources to support this process. Their experience was not unique, though, as this cycle plagued many ANBIOCORE affiliate researchers at UNSYIAH. Recognizing their affiliate's need for training in academic English writing, ANBIOCORE organized a workshop with their U.S. affiliate, Mississippi State University (MSU), to address the issue.

Dr. Gholib and researchers analyzing samples.

In the July 2018 'Training on Scientific Communication and Proposal Writing: International Training on Improvement Capacity Building and Scientific Publication,' MSU Prof. Erdogan Memili trained and mentored Indonesian researchers on how to write proposals and scientific publications. Drs. Gholib and Al Azhar were two of 40 researchers from UNSYIAH who participated in the training. "The training, especially the mentoring had a very significant impact on our researchers. It was very useful for upgrading our knowledge and skills," recalled Prof. Dr. drh. Muslim Akmal, ANBIOCORE Partnership Manager at UNSYIAH Aceh. As a result of the training, Drs. Gholib and Al Azhar successfully submitted their academic papers to the Scimago Journal Ranks (SJR), an internationally recognized, publicly available portal for journals and country scientific indicators. "We're so glad that finally, we had an opportunity to submit the papers to a journal publication using USAID SHERA's funding, and now the papers have been accepted and are being reviewed," Prof. Muslim added.

For Dr. Gholib, being accepted by SJR is a major achievement. "This is my first time submitting an academic paper to an open-access publication. I am so happy that finally I will have a publication in a prestigious journal," said Dr. Gholib. It was not easy for him to submit his academic paper to SJR, as SJR has very strict requirements and it is not free. "But thank God, ANBIOCORE provided resources and funding so that I could submit my paper," he added. Dr. Al Azhar also explained that while he had previously produced three publications, his SJR-accepted academic paper was his first to be published in the Scopus index. "I must admit that ANBIOCORE contributed to this achievement. After participating in the training on academic writing, I received a lot of insight and knowledge that was very useful for my writing skills," said Dr. Al Azhar.

Prof. Muslim noted that his institution has learned valuable lessons by joining ANBIOCORE. Research, publications, and other capacity building activities under ANBIOCORE project have aided UNSYIAH's university accreditation process. Researchers have also learned how to conduct and manage valuable, transparent, and accountable research. "Although we may not be under [the current iteration of] ANBIOCORE in the future, all of the best practices that we've received will still be very useful in the future," said Prof. Muslim.

Background

Interdisciplinary Graduate Education & Research in Animal Biotechnology & Coral Reef Fisheries to Achieve Indonesia Food Security (ANBIOCORE) is a USAID SHERA-funded Center for Collaborative Research (CCR). ANBIOCORE is led by Institut Pertanian Bogor (IPB). ANBIOCORE works on a strategic collaborative engagement in animal (livestock and fisheries) biotechnology for sustainable food production through innovative research and high-quality education.

Syiah Kuala University (UNSYIAH) in Aceh is one of seven ANBIOCORE affiliate institution which works in the livestock research cluster.

Impact

For UNSYIAH, the greatest impact of joining ANBIOCORE has been the improved capacity of its researchers in writing scientific papers. Two academic papers have been accepted in an internationally recognized publication, which is a major achievement for both for the researchers and the university. This provides credibility and opens the door to many new opportunities and networks.

Additionally, ANBIOCORE has provided opportunities for UNSYIAH students to be actively involved in capacity building activities, such as training on academic writing and research collaboration with other universities. "We're happy that ANBIOCORE has helped our students expand their knowledge by providing resources," said Prof. Muslim.

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Sustainable Higher Education Research Alliances

USAID SHERA Research Partnership Enhances Capacity of State Laboratory in East Java

As one of the world's most populous countries, Indonesia must maintain its livestock supply to ensure food security. Balai Besar Inseminasi Buatan (BBIB) Singosari, the Center for Artificial Insemination, supplies 60 percent of frozen semen production for Indonesia's livestock supply needs in Indonesia, making it the largest center of its kind in the country. Despite its large output, BBIB Singosari struggled to improve its researchers' capacity. "We provide resources, such as laboratory and its facilities, frozen semen, research samples, reagents, and experts for external partners. But our researchers have limited opportunity to join in collaborative research due to their daily routines," said Drh. Enniek Hewijanti, Head of BBIB Singosari.

In 2018, Universitas Brawijaya (UB), an ANBIOCORE affiliate institution, opened the door to international partnerships for BBIB Singosari. In partnership with ANBIOCORE, BBIB Singosari researchers directly participated in the research process with UB scholars, enhanced their knowledge related to Madura cattle, and even became co-authors on two Scopus-indexed academic publications. BBIB Singosari's researchers also participated in ANBIOCORE trainings and workshops, including an academic writing training led by Dr. Erdogan Memili from Mississippi State University in early 2019.

Enniek (second from the right) showcasing BBIB's laboratory facilities to visiting scholars.

"Being part of ANBIOCORE is an added value for BBIB Singosari. This collaboration is considered by the central government as an international engagement between Indonesian and the US institutions," remarked Enniek. As a state-owned laboratory under the Ministry of Agriculture, this is a great achievement for the organization, as the central government considers international collaboration a key indicator for the improved capacity of the organization. According to Enniek, BBIB Singosari has received broader recognition from reputable universities since joining ANBIOCORE, thanks to the USAID SHERA program's broad network in Indonesia and the U.S. As a result, many Indonesian universities have visited BBIB Singosari to learn more about its animal biotechnology research.

Although ANBIOCORE completed its grant under the USAID SHERA program in January 2020, the CCR is maintaining its partnership with BBIB Singosari and UB as it continues to collaborate with both institutions on animal biotechnology research. As Enniek shared, "We have built the network and will utilize it for further potential collaboration."

Background

Led by Institut Pertanian Bogor (IPB), Center for Collaborative Research (CCR) Interdisciplinary Graduate Education & Research in Animal Biotechnology & Coral Reef Fisheries to Achieve Food Security (ANBIOCORE) focuses on strategic collaborative engagement in animal (livestock and fisheries) biotechnology for sustainable food production through innovative research and high-quality education.

Impact

BBIB Singosari's collaboration with ANBIOCORE provided the CCR's researchers with valuable access to laboratory space and free frozen semen research samples. In turn, the ANBIOCORE partnership also provided added value for BBIB Singosari.

Through ANBIOCORE, BBIB Singosari gained access to an international partnership network that helped the research institution achieve government indicators, conduct collaborative research with reputable universities, enhance the capacity of its researchers, and co-author academic publications.

Enniek (center, holding poster) celebrating the CCR-BBIB Singosari partnership at an ANBIOCORE's event in 2019

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SHERA Training Improves Hospital Services and Research Capacity in Banda Aceh

When two UNSYIAH researchers attended CCR ARI's Good Clinical Practices (GCP) training in July 2017, the university originally saw the training as a good learning opportunity for some of its staff. However, once the researchers returned and began sharing their lessons learned, Prof. Maimun Syukri, the Dean of the Faculty of Medicine, saw that the training could have a broader impact in the community. If UNSYIAH itself replicated the training for doctors at the university and in the local hospital RSUD Zainoel Abidin, the doctors' skills could be enhanced, and the hospital services would be positively impacted. Moreover, by holding the training locally in Banda Aceh, it would be less expensive to conduct, making it possible for UNSYIAH to train more faculty and doctors.

Dr. Ichsan sharing the GCP training with his colleagues.

In April 2019, UNSYIAH successfully conducted its own GCP training for its doctors and researchers. The training aimed to provide participants with new perspectives on current health issues, particularly in respiratory infections. Additionally, new protocols and standards for handling patients were introduced. "The outcome of this training was to have GCP-certified doctors that could improve services in the hospital and the quality of the research," noted Dr. Ichsan, UNSYIAH's SHERA Partnership. Seeing the positive outcomes of the first training, the Dean soon convinced RSUD Zainoel Abidin, a state-owned hospital in Banda Aceh, to organize and replicate a similar training in May 2019 for its clinical doctors in the hospital.

According to Ichsan, those trainings had a significant impact on UNSYIAH faculty and RSUD Zainoel Abidin. It improved the capacity of UNSYIAH's researchers as they learned new knowledge on current health issues, while for RSUD Zainoel Abidin, the training significantly contributed to its accreditation appraisal process. As a result, RSUD Zainoel Abidin successfully maintained its status as a state-owned hospital with 'Paripurna' (perfect) scores in the hospital's research implementation and number of GCP-certified doctors. The trainings also presented the opportunity for UNSYIAH to broaden its networks, as UNSYIAH invited experts in from other universities to participate. Furthermore, Prodia, one of the largest clinical laboratory chains in Indonesia, provided the facilitator for the training, as well as funding support. Collaboration with Prodia demonstrated to UNSYIAH that by expanding partnerships beyond academia, there is great potential for broader public health research and outreach.

Background

The Good Clinical Practice training, first led by USAID SHERA's Center for Collaborative Research Acute Respiratory Infections (CCR ARI) in 2017, sought to improve local doctors' capacity in disease prevention. One of CCR ARI's affiliates, Universitas Syiah Kuala (UNSYIAH), soon took the training back to Banda Aceh and began to replicate it for medical practitioners and researchers alike.

CCR ARI, led by Universitas Padjadjaran from 2017-2020, sought to enhance the capacity among Indonesian university to perform quality and high-impact research on disease prevention.

Impact

CCR ARI has significantly contributed to the improved capacity of Unsyiah's Faculty of Medicine. Ichan noted, "Through SHERA and CCR ARI, Unsyiah has had good opportunities to improve our researchers' capacity, including the opportunity to submit academic papers to international conferences and to participate in international trainings." Unsyiah has also begun to adopt knowledge-sharing practices. For example, if its researchers attend an international seminar or training, they are now encouraged to share their experience and training with their colleagues and faculty members. On an institutional level, Unsyiah learned to look for new external opportunities for funding and collaboration. Through its GCP training collaboration with Prodia and the local government, Unsyiah now understands that public-private partnerships present unique opportunity for effective public health outreach in local communities.

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SHERA Improves the Quality of Medical Research in Eastern Indonesia

Located in Maluku Province, UNPATTI has become one of the most reputable universities in eastern part of Indonesia. However, it was still a challenge for UNPATTI to collaborate with other institutions due to its geographic isolation. "We [UNPATTI] are very far away from Jakarta and any reputable institutions that are mostly located in Java. It needs more effort for us to engage with many institutions," said Dr. dr. Bertha J. Que, the Dean of the Faculty of Medicine at UNPATTI.

According to Bertha, UNPATTI's Faculty of Medicine had the resources and motivation to develop its research on respiratory infections but was hampered by the lack of opportunity to collaborate with other reputable researchers, particularly at the international level. Therefore, when CCR ARI reached out to UNPATTI at the start of the USAID SHERA program, UNPATTI was eager to become of the CCR's affiliate institutions.

Since joining CCR ARI, UNPATTI's faculty have actively participated in international conferences, workshops on academic writing, exchange programs, and collaborative research activities. As a result of this productive partnership, UNAPTTI's Faculty of Medicine established an Ethical Committee to improve its research capacity in respiratory infections. This Ethical Committee consists of experts, researchers, and faculty members and seeks to promote high ethical standards for healthcare research. According to Bertha, "The Ethical Committee is the most significant achievement of the Faculty of Medicine UNPATTI. It wouldn't be possible without any supports from CCR ARI."

UNPATTI did not stop there, however. In its efforts to enhance the level of quality research, UNPATTI's faculty obtained external resources in 2018 to procure a -80 degree-Celsius freezer for research equipment. "Because of the CCR ARI's activities, we also successfully convinced the university to provide research equipment, and even we received additional support for the electricity supply," Bertha explained.

Though CCR ARI concluded its work under the USAID SHERA program in 2020, its networks remain active. Currently, UNPATTI is continuing several research activities with UNPAD on respiratory infections and is in the process of securing additional external funding for the work. "We're glad that we had the opportunity to be involved in CCR ARI's activities. […] we have had many opportunities to broaden our networks with other institutions," Bertha concluded.

Background

Under the USAID SHERA program, Center for Collaborative Research Acute Respiratory Infections (CCR ARI), sought to enhance the capacity among Indonesian universities to perform quality and high-impact research on disease prevention.

With support from CCR ARI, the Faculty of Medicine at Universitas Pattimura (UNPATTI), established an Ethical Committee to improve the quality of its research. This committee was the first of its kind in eastern Indonesia.

Impact

Under the USAID SHERA program, UNPATTI established an Ethical Committee to institute high ethical standards in public health and medical research. This has greatly improved the university's ability to conduct research on respiratory infections according to ethical, world-class standards.

Since joining CCR ARI, UNPATTI's researchers have also had the opportunity to collaborate with a variety of experts and researchers from Indonesia and the U.S., in addition to joining workshops and trainings on academic writing. This has allowed its researchers to begin presenting their research results at international conferences and disseminating their work to a broad, global audience.

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SHERA Leads to New Networks and Recognition for Emerging University

Established in 2006, UBB is considered an emerging university in Indonesia. As a new higher education institution (HEI), it was not easy for UBB to gain recognition amongst its stakeholders and peers. "We [UBB] are still young compared to Universitas Indonesia, Universitas Padjadjaran, or any other state-owned university in Indonesia. Not many people know where UBB is," said Wahri Sunanda, S.T., M. Eng., Dean of the Faculty of Engineering UBB.

It was a challenge for UBB to improve its capacity in the first years of its establishment. Few UBB researchers had academic papers published in the Scopus index journal at that time. According to the 2017 university ranking issued by the Ministry of Research, Technology and Higher Education (Kemristekdikti), UBB ranked only 370 out of 2,500 HEIs in Indonesia.

Speakers, guests, and local government representatives at the opening ceremony of ICoGEE 2019

Despite these challenges, UBB never stopped seeking opportunities to collaborate with other Indonesian HEIs, as it knew that broadening its networks was vital for improving its research and management capacity. In 2017, Universitas Gadjah Mada (UGM), the lead university of CDSR, asked UBB to join the consortia as an affiliate. "It was an honour for us [UBB] to be trusted to join in international collaboration. We had heard that this collaboration [CDSR] will involve U.S. institutions so that we will be able to learn from U.S. scholars as well," Wahri added.

Since joining CDSR, UBB has participated in many activities, such as workshops on writing academic papers, site visits to Semujur Island to conduct research on microalgae, and presenting at international conferences. Through these activities, UBB's researchers and lecturers have also had the opportunity to build networks with other Indonesian scholars and researchers.

Continued on next page.

Background

Being recognized internationally is a tremendous achievement for Universitas Bangka Belitung (UBB). Through participation in the Center for Development of Sustainable Region (CDSR), UBB has improved its capacity and broaden its networks internationally. Its culminating achievement under SHERA was hosting an international conference for the first time in 2019.

CDSR is one of SHERA's five Centers for Collaborative Research (CCRs), which focuses on multidisciplinary collaboration in conducting research to promote energy efficiency and independence in Indonesia.

Impact

Since joining CDSR, UBB has encouraged its researchers to produce more publications and increase submissions to international conferences. These activities have positively impacted UBB's accreditation process.

Through its collaboration with CDSR, UBB is currently seeking sustainability support from the local government and private sectors to develop further research on microalgae as an alternative renewable energy source. Researchers from UBB and CDSR have presented the research to the local government are currently waiting to hear more from the government.

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Sustainable Higher Education Research Alliances

Continued from previous page.

However, UBB's greatest achievement since joining CDSR was hosting the International Conference on Green Energy and the Environment in September 2019. This was the first international event ever hosted by UBB. "We were very honoured yet challenged. We had never hosted any international events before, but we tried our best to make the event successful," said Wahri, who acted as the Chairman of the event.

Scholar presenting at ICoGEE 2019, hosted by UBB.

The first challenge UBB faced in hosting the conference was convincing participants to submit academic papers. UBB was less popular compared to other large universities in Indonesia for hosting an international conference. Subsequently, the first two months of open registration saw paper submissions far below the target. "Participants maybe didn't know submission deadline while also convincing participants that the conference is trustworthy" Wahri said. UBB turned to CDSR lead university UGM for assistance, who then used its large sphere of influence to spread the word and attract interest in the event.

Another challenge UBB faced was inviting international speakers. With its lack of experience in hosting international events, UBB was not sure who would speak at the conference. Fortunately, Wahri knew some international scholars from when he attended a conference in Thailand in 2018 and he invited them to become speakers. CDSR also helped him to invite other international scholars to attend the conference and all Wahri's colleagues in the UBB Faculty of Engineering helped prepare for the event. "We're so glad that the conference finally went very well and smoothly, although it was our first time hosting an international conference," Wahri shared. In the end, the conference boasted 4,766 participants, 46.8% of which were women.

Many lecturers and researchers from UBB submitted and presented their academic papers at the conference, in addition to scholars from across Indonesia. This then increased the number of UBB Scopus-indexed academic papers. Since joining CDSR in 2017, UBB has published 40 academic papers. This increase in publications has directly contributed to the university's accreditation by the Government of Indonesia. "We used to be [ranked] 370, but in 2019 we were in 191. This is a very big achievement for us," remarked Wahri.

In the end, the conference boasted 4,766 participants, 46.8% of which were women.

CDSR
CENTER FOR DEVELOPMENT OF SUSTAINABLE REGION

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Changing Research Paradigms to Support Local Communities

Through CDSR, Dintani Yudhita Noorzakiah Naimah learned how to build valuable cross-disciplinary networks amongst researchers in Indonesia. By working with researchers from different universities, she has had more opportunities to learn from experts in a variety of fields who also work on renewal energy solutions. "The strength of CDSR is in its excellent networks. I have met many researchers from various universities and with different expertise," said Dintani, reflecting on the role CDSR has played in her life.

The first time she heard about CDSR in 2017, Dintani was impressed with CDSR's renewable energy business concept. CDSR has a unique approach, in that it considers the social aspects of renewable energy in addition to the technical aspects of its research. This approach led her to join CDSR as an independent researcher. Dintani soon became involved in three CDSR research projects, including its *Developing Matrix of Women Role in Sustainability Design*. She was drawn to this work as she had previously conducted research on the same topic when she pursued her Master's in Sweden. The project was eventually presented at a 2018 exhibition for the Small Grant Project, hosted by the United Nations Development Programme (UNDP). "I was excited knowing that UNDP is interested in our topic and that they decided to adopt the research method," Dintani remarked.

After the UNDP adopted CDSR's work, the UNDP then replicated the research methodology and approach and expanded it into in four areas across three provinces in Indonesia: Semau Island, Gorontalo, Nusa Penida and Wakatobi. UNDP also appointed Dintani as the project's program manager. This accomplishment has allowed Dintani to continue her research beyond SHERA.

Dintani presenting her research at a 2018 training

Despite this achievement, getting there was not easy. Dintani remembered that when she first joined CDSR, she had to learn the rules and regulations for conducting research. This included practices like creating progress reports for her research. "I called it 'learning by doing.' While conducting my research, I always asked people in CDSR about the regulations that I had to follow. Pak Rachmawan [CDSR's Program Director] helped me a lot in this situation," said Dintani. Another challenge that she faced during the research was time limitations and proper financial reporting. Her research had to meet the timelines given by CDSR and SHERA, so she needed to collect the data and write the manuscripts on time. For the financial reporting, she also needed to stick to the budget that had already been approved by CDSR and SHERA.

While it was a steep learning curve at times, Dintani grew a lot from those challenges and feels they brought her success. Dintani reflected, "From CDSR, I learned that we need to change the paradigm- that researchers should not only work for publication, but research finding can be enriched with other disciplines. It can be salable and bring more benefits to other parties or communities."

Background

Dintani Yudhita Noorzakiah Naimah, a researcher with the Center for Development of Sustainable Region (CDSR), has experienced the positive gains cross-sectoral collaboration can bring to research. Through networking and collaboration with researchers from a variety of fields, her renewable energy research methodology has been adopted and expanded by the United Nations Development Programme in Indonesia.

CDSR is one of SHERA's five Centers for Collaborative Research (CCRs), which focuses on multidisciplinary collaboration in conducting research to promote energy efficiency and independence in Indonesia.

Impact

CDSR greatly improved Dintani's capacity as an independent researcher by leading several workshops on research best practices. Working with CDSR also gave her the opportunity to collaborate with other researchers from diverse universities in Indonesia and abroad. As a result of her SHERA-funded research with CDSR and having the opportunity to collaborate with other institutions, her research method is now being recognized by UNDP and being replicated across three provinces in Indonesia.

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From Research Concept to Reality: Sustainability Energy Solutions in Indonesia

Indonesia faces an enormous challenge in combatting its high levels of pollution. As the most populous country in Southeast Asia, it experiences high traffic volume from transportation fueled by non-renewable energy. To help solve this problem, researchers at ITB have long been interested in developing electrical vehicles, as they are both environmentally friendly and sustainable. They built out a concept and prototype, but they lacked two important ingredients: Funding and key partnerships. They needed to hire experts, procure software, and establish relationships with the private sector.

When the USAID SHERA program was introduced to ITB in 2017, Dr. Bentang Arief Budiman and his fellow researchers realized this was the opportunity to make their concept a reality. Under the newly formed National Center for Sustainable Transportation Technology (NCSTT), the team set out to develop an E-trike, a battery-powered electric trike that could be used as a goods delivery vehicle. They formed a research cluster focusing specifically on establishing partnerships for e-trike mass production and developing battery technology. "After USAID funding was available through SHERA, we started to hire experts, build partnerships, and develop the prototype," Bentang reflected.

NCSTT's E-trike Prototype

The USAID SHERA program also gave NCSTT the opportunity to broaden its networks and establish partnerships with the private sector. To support the development of the E-trike prototype, NCSTT approached Bakrie and Brothers, an Indonesian company that focuses on manufacturing and infrastructure, for future mass production. This private sector partnership is critically important for the future development and sustainability of the product. NCSTT also built partnerships with other universities such as Universitas Sebelas Maret, which has its own battery factory, to develop the E-trike batteries.

In November 2019, NCSTT successfully launched the E-trike prototype at the 6th International Conference on Electric Vehicular Technology (ICEVT) in Bali. It was a significant achievement for NCSTT, as the prototype was finally introduced to the public. "The conference [ICEVT] itself was the opportunity for us to broaden our networks. We've received so many new networks as well as feedback from experts and scholars who attended the conference. That feedback is very useful for NCSTT to improve the technology of the E-trike," Bentang noted. In addition to this success for NCSTT and its partners, the E-trike prototype development will more broadly benefit Indonesia. As the Government of Indonesia continues to encourage the development of electrical vehicles and boots the surrounding industry, NCSTT is well primed to serve as an important leader of positive change.

Background

The National Center for Sustainable Transportation Technology (NCSTT) is a USAID SHERA-funded Center for Collaborative Research (CCR). NCSTT is led by Institut Teknologi Bandung (ITB) and seeks integrated solutions for transportation problems in Indonesia.

Impact

In addition to funding support for the E-trike prototype, SHERA has enabled NCSTT to broaden its networks and build the capacity of its researchers. NCSTT has established a public-private partnership with Bakrie and Brothers to support mass production of the prototype, and has collaborated with other universities in Indonesia and the U.S. Additionally, ITB as the lead university of NCSTT, worked with the Government of Indonesia to develop MIT – Indonesia Research Alliances (MIRA), which aims to maintain the sustainability of the research beyond the USAID SHERA program. Through trainings and workshops organized by SHERA, NCSTT's researchers and scholars have also had the opportunity and confidence to submit their academic papers to international conferences and prestigious Scopus-indexed journals.

6th ICEVT Participants, Bali, November 2019

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USAID SHERA Fast Tracks Indonesian University on Path to Accreditation and Peer Recognition

Located on Kalimantan Island, ITK was established in 2014 and only offered an electrical engineering program to undergraduate students at its start. As a new university, ITK had limited facilities and researchers, and the university struggled to gain recognition from other Indonesian higher education institutions (HEIs). With limited resources and connections, ITK faced many barriers as it sought to develop its advanced technologies research.

Those challenges were then compounded when the time came for ITK's assessment by the National Accreditation Agency (Badan Akreditasi Nasional), which measured the institution against thresholds for international publications, international conference attendance, and partnerships with other institutions. ITK did not meet any of the requirements at that time. Dr. Mohammad Muntaha, ITK's Partnership Manager, remembered, "It was a hard time for us. We had tried to improve our capacity through many ways, but we hadn't reached the maximum results."

This all changed in 2017 when ITB, the lead university of NCSTT, asked ITK to join its research consortia as an affiliate institution. Through NCSTT, ITK suddenly had the opportunity to join collaborative research on applied engineering and technology for transportation systems, which gave ITK more recognition amongst its peers.

Since joining NCSTT, ITK has been involved in several research activities led by ITB, namely in developing batteries for electric vehicles. In 2018, ITK researchers also participated in two of the CCR's trainings in Banjarmasin and Manado. These trainings helped ITK's researchers improve their skills in writing academic papers in English. As a result, a total of five Scopus-indexed academic papers were published. Additionally, ITK has been able to broaden its networks through attending international events such as the ITB-led 6th International Conference on Electric Vehicular Technology 2019 in Bali. "It's an honor for us to be part of NCSTT and have the opportunity to broaden our networks and to collaborate with researchers from various universities," Muntaha shared.

ITK researcher presenting during a 2018 NCSTT program coordination meeting.

All these achievements contributed to ITK finally passing its accreditation assessment in 2018, when it successfully gained a 'B' score after having received a 'C' in 2014. Muntaha mentioned that it was the NCSTT activities that played a significant role during the assessment process. "Through NCSTT, the number of international publications and attended international conferences have increased. Other than that, we also have built partnerships with other HEIs and other stakeholders in conducting collaborative research," Muntaha reflected.

Background

As a new higher education institution, Institut Teknologi Kalimantan (ITK) faced challenges in developing advanced research on technologies. In 2017, the National Center for Sustainable Transportation Technologies (NCSTT) opened the door for ITK to improve its capacity through collaborative research. As a result of its partnership with NCSTT, ITK successfully upgraded its accreditation status from a 'C' to 'B.'

Led by Institut Teknologi Bandung (ITB), NCSTT is one of the USAID SHERA program's five Centers for Collaborative Research (CCRs), which focuses on seeking integrated solutions for transportation problems in Indonesia.

Impact

It was a challenge for ITK to follow all USAID regulations and rules at the beginning of the USAID SHERA program, as it was the institution's first time joining an international collaborative research project. Since 2017, ITK has grown under the mentoring and support it has received from NCSTT and the overall USAID SHERA program. It has achieved newfound success in publishing Scopus-indexed academic papers, increasing its visibility at international conferences, and seeking potential research partnerships.

USAID
DARI RAKYAT AMERIKA

Sustainable Higher Education Research Alliances

Universitas Udayana Establishes SMART CITY Research Center

When UNUD joined the USAID SHERA program in 2018 as an affiliate university in CCR SMART CITY's consortia, the university's researchers suddenly had the opportunity to collaborate with other experts and broaden their networks. Through the program's support and mentorship, UNUD began to increase its number of publications and produced nine Scopus-indexed academic papers.

However, one overarching challenge persisted. SMART CITY's research focused on urban planning and development issues, which meant that its researchers were coming from diverse scientific background and departments at UNUD. The interdisciplinary nature of the research made it quite challenging at times for UNUD's researchers to conduct collaborative work, particularly when trying to coordinate and communicate outside their respective departments and faculties. "Although we were the affiliate of SMART CITY, we didn't have a local forum to regularly discuss any issues related to urban planning and development issues," said Dr. Gusti Ayu Made Suartika, Head of UNUD's Research Cluster.

To overcome this challenge, UNUD began to discuss research management practices with UI, SMART CITY's lead university. Then, during the August 2018 Management and Partnership Monitoring and Evaluation Workshop in Bali, the CCR provided further training and encouraged its local partners to establish their own research hubs. "Starting from that moment, UNUD decided to establish its own research center," Suartika reflected.

UNUD at a 2018 SMART CITY workshop

UNUD's CCR researchers took this idea to the university and local government, who in turn fully supported the initiative. Today, the UNUD SMART CITY Research Center is active under the university's Research and Community Service Institution (Lembaga Penelitian dan Pengabdian Masyarakat) and is directly monitored by the Rector. The local government also supports the center and invites the researchers to provide scientific advice on urban planning issues in Bali.

The establishment of the SMART CITY Research Center has provided UNUD's researchers with many opportunities to improve their capacity. For example, the center held a public lecture in May 2019 in collaboration with the Embassy of Japan's Energy Attaché in Indonesia, which drew 150 students and faculty members from UNUD. Additionally, to broaden its networks, UNUD's SMART CITY Research Center has sought out collaboration with Indonesian research partners from a variety of universities outside the SMART CITY consortia, and is now preparing to host the Third International Conference on SMART CITY Innovation in October 2020. "This research center will be continuously developed for further research collaboration to support the local government. We are glad that finally, we were able to establish our own research center," Suartika concluded.

Background

SMART CITY, led by Universitas Indonesia (UI), is one of the USAID SHERA program's five Centers for Collaborative Research (CCRs). It focuses on urban planning and development issues in Indonesia.

SMART CITY helped one of its affiliate universities, Universitas Udayana (UNUD, to establish its own interdisciplinary research center by providing training on research management and policy development.

Impact

UNUD's establishment of its own SMART CITY Research Center was a significant achievement for this university. When UNUD originally joined the USAID SHERA program, it anticipated that it would focus on publishing academic papers. However, this research center was a hugely positive, unexpected outcome for the university. Through the research center, UNUD has been able to broaden its network, engage with the local government of Bali, and address urban planning and development issues.


UNUD meeting with Government of Bali and the Government of Japan in 2019.

Annex VI: CCR Knowledge Products

ANBIOCORE				
No	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
1	Q1 Oct 17 - Dec 17	IPB	Paper	Full Paper ASCM - Published in Proceeding
2	Q1 Oct 17 - Dec 17	IPB	Poster	Conservation of banteng (Bos javanicus) through comprehensive approach: phylogenetic, paternity and fertility genetic markers analysis and application of assisted reproductive technology
3	Q1 Oct 17 - Dec 17	IPB	Poster	Habituation process for assessing ovarian cycle using ultrasonography (USG) to establish artificial insemination program in Banteng (Bos javanicus)
4	Q1 Oct 17 - Dec 17	IPB	Paper	Embryo Transfer and Artificial Insemination Program of Belgian Blue Cattle in Indonesia: Pregnancy Rate, Birth Weight and Calving Ease
5	Q1 Oct 17 - Dec 17	IPB	Paper	Reproductive Efficiency of Brahman Cross Cattle Using Artificial Insemination with Frozen Semen from Bali, Brahman, Limousin, and Simmental Cattle
6	Q1 Oct 17 - Dec 17	IPB	Paper	Production Trait of Crossbreed Cattle and Reproductive Disorders in Brahman Cross (BX) Breeding Program at PT lembu Jantan Perkasa
7	Q1 Oct 17 - Dec 17	IPB	Paper	Semen Characteristic of Banteng (Bos Javanicus) Collected by Electroejaculation Method
8	Q1 Oct 17 - Dec 17	IPB	Paper	Analysis of Sperm Freezing Capability of Various Bulls at Singosari AI center
9	Q1 Oct 17 - Dec 17	IPB	Paper	Sperm Freezability of Various Breed of Bulls at Lembang AI Center
10	Q1 Oct 17 - Dec 17	IPB	Paper	In Vivo Embryo Production at Cipelang Livestock Embryo Centre
11	Q1 Oct 17 - Dec 17	UNPAD	Paper	Viability Of Ram's X-Y Sperm After Sexing With Bovine Serume Albumin at Different Incubation Time
12	Q2 Jan 18 - Mar 18	IPB	Research Training Module	Training on Scientific Communication: Essentials of Writing Quality Research Paper and Competitive Research Proposal
13	Q2 Jan 18 - Mar 18	IPB	Research Training Module	Training on Research Methodology and Scientific Conducts

ANBIOCORE				
No	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
14	Q2 Jan 18 - Mar 18	UNPAD	Research Training Module	Training on Scientific Communication and Proposal Writing
15	Q2 Jan 18 - Mar 18	IPB, UB	Research Training Module	Training on Scientific Communication and Proposal Writing
16	Q3 Apr 18 - Jun 18	IPB	Poster	Composition and estimation of Shark Size on Coral Reef Ecosystem on Dampier Strait MPA, Raja Ampat
17	Q3 Apr 18 - Jun 18	IPB	Paper	Effect of no take zone on reef fish biodiversity and biomass within marine protected areas in Raja Ampat, Indonesia
18	Q3 Apr 18 - Jun 18	IPB	Paper	See the unseen: revealing hidden diversity of planktonic organisms in an Indonesian reef system using environmental DNA
19	Q3 Apr 18 - Jun 18	IPB	Paper	The use of DNA metabarcoding in food web construction to support Coral reef fisheries management in Raja Ampat
20	Q4 Jul 18 - Sep 18	IPB, UNRAM	Research Modules/Guidelines	Training on DNA Barcoding-Metabarcoding and DNA Profiling
21	Q4 Jul 18 - Sep 18	IPB, UNSYIAH	Research Modules/Guidelines	Training on Scientific Communication and Proposal Writing: International Training on Improvement of Capacity Building and Scientific Publication
22	Q4 Jul 18 - Sep 18	IPB	Research Modules/Guidelines	Training on Fundamental and Application of Bioethics in Animal and Fisheries Research
23	Q4 Jul 18 - Sep 18	IPB, UNDANA	Research Modules/Guidelines	Training on Scientific Communication and Proposal Writing: Strengthening Research Quality Through Scientific Writing and Capacity Building
24	Q4 Jul 18 - Sep 18	IPB, UNIPA	Research Modules/Guidelines	Training on Data Analysis Method on Oceanography
25	Q4 Jul 18 - Sep 18	IPB, UNUD	Research Modules/Guidelines	Training on Method of Surveys (Coral, Fish, Seagrass, Seaweed, Tides, Current, and Wave)
26	Q4 Jul 18 - Sep 18	IPB	Poster	CCR ANBIOCORE - Animal Biotechnology and Coral reef Fisheries, Affiliates Research Cluster, ANBIOCORE Veterinary, ANBIOCORE Fisheries

ANBIOCORE				
No	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
27	Q4 Jul 18 - Sep 18	UNSYIAH	Poster	Poster Unsyiah 1, Poster Unsyiah 2, Poster Unsyiah 3
28	Q4 Jul 18 - Sep 18	UNPAD	Poster	Poster UNPAD 1, Poster UNPAD 2
29	Q4 Jul 18 - Sep 18	UB	Poster	Poster UB
30	Q4 Jul 18 - Sep 18	UNDANA	Poster	Poster UNDANA 1, Poster UNDANA 2
31	Q4 Jul 18 - Sep 18	UNUD	Poster	Poster UNUD 1, Poster UNUD 2, Poster UNUD 3
32	Q4 Jul 18 - Sep 18	UNRAM	Poster	Poster UNRAM 1, Poster UNRAM 2, Poster UNRAM 3
33	Q4 Jul 18 - Sep 18	UNIPA	Poster	Poster UNIPA
34	Q4 Jul 18 - Sep 18	IPB	Brochure/Flyer/Research Leaflet CCR	Flyer Annual Conference - Cover, Flyer Annual Conference - Content
35	Q4 Jul 18 - Sep 18	IPB	Infographic	Research Raja Ampat - CCR ANBIOCORE
36	Q4 Jul 18 - Sep 18	IPB	Infographic	Research Lombok - CCR ANBIOCORE
37	Q4 Jul 18 - Sep 18	IPB	Infographic	ANBIOCORE as USAID SHERA CCR for Food Security Self Sufficiency
38	Q4 Jul 18 - Sep 18	IPB	Research Modules/Guidelines	Panduan Konferensi dan Publikasi
39	Q4 Jul 18 - Sep 18	IPB	Research Modules/Guidelines	Panduan Pelaporan Kegiatan
40	Q4 Jul 18 - Sep 18	IPB	Poster	Poster IMCC
41	Q2 Jan 19 - Mar 19	UNRAM	Paper	Practical Resilience Index for Coral Reef Assessment
42	Q2 Jan 19 - Mar 19	UNRAM	Paper	Differential impacts of 2016 coral bleaching on coral reef benthic communities at Sekotong Bay, Lombok Barat, Indonesia

ANBIOCORE				
No	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
43	Q2 Jan 19 - Mar 19	IPB	Paper	Short Communication: Molecular identification of White Sea Squirt Didemnum sp. (Tunicata, Ascidiacea) colonies growing over corals in Raja Ampat Islands, Indonesia
44	Q2 Jan 19 - Mar 19	IPB	Paper	Review: Sperm: Comparative morphology and function related to altered reproductive strategies and fertility in mammals
45	Q2 Jan 19 - Mar 19	IPB	Poster	Genomic diversity of native cattle breeds in Indonesia
46	Q2 Jan 19 - Mar 19	IPB	Paper	Review: Potential of water buffalo in world agriculture: Challenges and opportunities
47	Q2 Jan 19 - Mar 19	IPB	Paper	Solutions for Grand challenges in goat and sheep production
48	Q3 Apr 19 - Jun 19	IPB	Infographic	Animal Biotechnology and Coral Reef Fisheries
49	Q3 Apr 19 - Jun 19	IPB	Infographic	Compilation of Scientific Articles & Abstracts 2019
50	Q3 Apr 19 - Jun 19	UB	Paper	Semen Production of Simmental Bulls based on Different Body Weight at National Artificial Insemination Center (NAIC), Singosari Indonesia
51	Q3 Apr 19 - Jun 19	UB	Paper	The estimation of semen production based on body weight and scrotal circumference on PO Bull at Singosari National Artificial Insemination Center
52	Q3 Apr 19 - Jun 19	UNPAD	Paper	Evaluation of Pasundan Cattle semen quality in three different types of extender
53	Q3 Apr 19 - Jun 19	IPB	Paper	Characteristic of the post-thawed Balinese bull semen extended in three different extenders and equilibration times
54	Q3 Apr 19 - Jun 19	IPB	Paper	See the unseen: revealing hidden diversity of planktonic organisms in a Indonesian reef system using environmental DNA
55	Q4 Jul 19 - Sep 19	IPB	Infographic	Booklet - ANBIOCORE (Animal Biotechnology and Coral Reef Fisheries)
56	Q4 Jul 19 - Sep 19	UNSYIAH	Paper	Validation of a commercial enzyme-linked immunosorbent assay and evaluation the effect of freeze-thaw cycles of serum on the stability of cortisol and testosterone concentrations in cattle
57	Q4 Jul 19 - Sep 19	UB	Paper	Correlations between age of Bali bull and semen production at National Artificial Insemination Center, Singosari - Indonesia

ANBIOCORE				
No	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
58	Q4 Jul 19 - Sep 19	UNDANA	Paper	Blood Biochemical Profile, AST and ALT of Sumba Ongole Cattle
59	Q4 Jul 19 - Sep 19	UNSYIAH	Paper	Polymorphism of myostatin gene in the local Aceh cattle

CCR ARI				
No	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
1	Q3 Apr 18 - Jun 18	UNPAD	Module	Burden of ARI Caused by RSV and Influenza in Hospitalized Children & Adult in Indonesia
2	Q4 Jul 18 - Sep 18	UNPAD	Infographic	Alur Penelitian Burden of Disease-Anak
3	Q4 Jul 18 - Sep 18	UNPAD	Infographic	Alur Penelitian Burden of Disease-Dewasa
4	Q4 Jul 18 - Sep 18	UNPAD	Infographic	Alur Penelitian Burden of Disease
5	Q4 Jul 18 - Sep 18	UNPAD	Poster	Policy Study
6	Q4 Jul 18 - Sep 18	UNPAD	Poster	Education Program
7	Q4 Jul 18 - Sep 18	UNPAD	Poster	Research Program
8	Q4 Jul 18 - Sep 18	UNPAD	Poster	About CCR-ARI
9	Q4 Jul 18 - Sep 18	UNPAD	Module	Immunogenicity and Safety of Trivalent Influenza Vaccine Using Pharmajet Stratis® Needle-free Injector in Indonesian Adolescents, Adults, and Elderly Clinical Trial Protocol
10	Q4 Jul 18 - Sep 18	UNPAD	Video	Kausalitas Dalam Epidemiologi
11	Q4 Jul 18 - Sep 18	UNPAD	Video	Pengantar Epidemiologi

CCR ARI				
No	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
12	Q1 Oct 18 - Dec 18	UNPAD	Module	Definisi Operasional Burden of Acute Respiratory Infections in Hospiralized Adult and Children in Indonesia
13	Q1 Oct 18 - Dec 18	UNPAD	Poster	Risk Factors for Mortality in Children Hospitalized with Pneumonia in Hasan Sadikin Hospital
14	Q1 Oct 18 - Dec 18	UNPAD	Poster	The Validity of Pediatric Respiratory Severity Score as an Early Outcome Predictor in Acute Respiratory Infection at Emergency Setting
15	Q1 Oct 18 - Dec 18	UNPAD	Poster	Community Acquired Pneumonia Clinical Characteristics Among Children in Dr. Hasan Sadikin General Hospital Bandung, Indonesia
16	Q2 Jan 19 - Mar 19	UNPAD	Module	Post Discharge Study
17	Q2 Jan 19 - Mar 19	UNPAD	Module	The Dynamics of Serologic Titer and Safety of Trivalent Influenza Vaccine (TIV) in Indonesian Population
18	Q2 Jan 19 - Mar 19	UNPAD	Module	Studi Mengenai Penyebab Kematian pada Rumah Sakit di Indonesia
19	Q2 Jan 19 - Mar 19	UNPAD	Paper	Geographical Clustering of Human Influenza a Virus Infections in Two Communities in Indonesia
20	Q3 Apr 19 - Jun 19	UNPAD	Paper	Association of Maternal Vitamin D Deficiency and Infants' Neurodevelopmental Status: a Cohort Study on Vitamin D and Its Impact During Pregnancy and Childhood in Indonesia
21	Q3 Apr 19 - Jun 19	UNPAD	Paper	Molecular Mechanism of Aloe Barbadensis Miller as a Potential Herbal Medicine
22	Q3 Apr 19 - Jun 19	UNPAD	Paper	Phytochemical Screening and Histology Appearance of Acute Oral Toxicity Study on Ethanol Extract of Psidium Guajava Linn Fruit in Mice
23	Q3 Apr 19 - Jun 19	UNPAD	Paper	Otitis Media Related Hearing Loss in Indonesian School Children
24	Q3 Apr 19 - Jun 19	UNPAD	Poster	Influenza Virus Infection in Children and Adolescent in the Out-Patient Setting

CCR ARI				
No	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
25	Q3 Apr 19 - Jun 19	UNRAM	Poster	Biomarkers as Outcome Predictor of Children Hospitalized with Severe Community Acquired Pneumonia in West Nusa Tenggara Province General Hospital
26	Q4 Jul 19 - Sep 19	UNPAD	Poster	Phylogeny of Influenza a (H1N1pdm09 and H3N2) Viruses in Bandung District Between 2008 and 2011
27	Q4 Jul 19 - Sep 19	UNPAD	Poster	Epidemiology of Influenza Virus Infection Among Influenza-Like-Illness Patients in the Out-Patient Setting
28	Q4 Jul 19 - Sep 19	UNPAD	Poster	Acceptability and Determinant of Influenza Vaccination Among Health Care Workers

CDSR				
No.	**Period**	**Institutions Involved**	**Type of Knowledge Product Created**	**Title of Knowledge Product** *URL Provided, where applicable/available*
1	Q1 Oct 17 - Dec 17	UGM	Research Report	Developing Matrix of Women Role in Implementation of Biogas Technology
2	Q2 Jan 18 - Mar 18	UGM	Video	Nogotirto Algae Park UGM
3	Q3 Apr 18 - Jun 18	UGM, UI, ITB, IPB, UBB, UNG, UMGO	Video	Partner meeting
4	Q3 Apr 18 - Jun 18	UGM, UI, ITB, IPB, UBB, UNG, UMGO	Video	Building Energy Simulation Training di ITB
5	Q3 Apr 18 - Jun 18	UGM, UI, ITB, IPB, UBB, UNG, UMGO	Video	Training Course on Bioenergy, Biorefinery and Energy Efficiency in IPB
6	Q3 Apr 18 - Jun 18	UGM, UI, ITB, IPB, UBB, UNG, UMGO	Video	Training PV and Smart Grid UGM
7	Q3 Apr 18 - Jun 18	UGM, UI, ITB, IPB, UBB, UNG, UMGO	Video	Training Research Methodology and Network Developing, Universitas Bangka Belitung
8	Q3 Apr 18 - Jun 18	UGM, UI, ITB, IPB, UBB, UNG, UMGO	Video	Training biorefinery dan Microalgae di Universitas Indonesia
9	Q3 Apr 18 - Jun 18	UGM, UBB	Video	Semujur Island
10	Q3 Apr 18 - Jun 18	UGM	Video	Karimunjawa Island
11	Q3 Apr 18 - Jun 18	UGM, ITB, IPB, UI, UNG, UMGo, UBB	Poster	One Year Achievement
12	Q4 Jul 18 - Sep 18	UGM, ITB, IPB, UI, UNG, UMGo, UBB	Booklet	Abstract Compilation
13	Q4 Jul 18 - Sep 18	UGM, ITB, IPB, UI, UNG, UMGo, UBB	Booklet	CDSR One Year Achievement
14	Q4 Jul 18 - Sep 18	UGM	Research Report	Program Development of Clean Energy Technology and Local Institution as Comprehensive Scheme in Karimunjawa Island
15	Q4 Jul 18 - Sep 18	UMGo	Research Report	Prospek Sistem Energi Hibrid Asal Panas Bumi dan Energi Matahari Di Gorontalo
16	Q4 Jul 18 - Sep 18	UNG	Research Report	Sustainable Use of Renewable Electrical Energy Sources in Southern Part of Gorontalo Province, Indonesia

17	Q4 Jul 18 - Sep 18	ITB	Research Report	Report on Nearly Zero Energy Building Research
18	Q4 Jul 18 - Sep 18	UGM	Research Report	Formulating Comprehensive Lesson Learned from Several Past Projects Conducted by Parties Involveed (BIPV) for Nearly Zero Energy Building (NZEB) of Colorado Boulder
19	Q4 Jul 18 - Sep 18	UGM	Research Report	Developing Method to Achieve nZEB Model for Buildings in Yogyakarta and Bandung
20	Q4 Jul 18 - Sep 18	UMGo	Research Report	Pembangunan IOT (Internet of Things) Berbasis Sel Surya pada Universitas Muhammadiyah Gorontalo
21	Q4 Jul 18 - Sep 18	UGM	Research Report	Peningkatan Aspek Quality Control Fasilitas Produksi Microalgae-Based Biorefinery Berbasis Data Penelitian
22	Q4 Jul 18 - Sep 18	UGM	Research Report	Microalgae Based Biorefinery (Lesson Learned)
23	Q4 Jul 18 - Sep 18	UBB	Research Report	Pemetaan Sosial Masyarakat, Geografis dan Identifikasi Parameter Lingkungan Pulau Semujur, Kabupaten Bangka Tengah
24	Q4 Jul 18 - Sep 18	IPB	Research Report	Pemetaan Potensi Biomassa di Pulau Semujur, Provinsi Bangka Belitung
25	Q4 Jul 18 - Sep 18	IPB	Research Report	Pengembangan Energi Biomassa: Potensi Biomassa sebagai Bahan bakar Pembangkit Listrik di Hutan Pendidikan Gunung Walat, Sukabumi, Jawa Barat
26	Q4 Jul 18 - Sep 18	IPB	Research Report	Kinerja Pertumbuhan Provenans Jabon Putih sebagai Kayu Energi di Parung Panjang, Bogor
27	Q4 Jul 18 - Sep 18	UNG	Research Report	Production Bioethanol from Water Hyacinth in Limboto Lake Gorontalo Province
28	Q4 Jul 18 - Sep 18	UMGo	Research Report	Pemetaan Sebaran Solar Panel Berbasis Web-GIS untuk Prencanaan Pembangunan Berkelanjutan
29	Q4 Jul 18 - Sep 18	UMGo	Research Report	Identifikasi Potensi Angin sebagai Perencanaan Pembangunan Pembangkit Listrik Tenaga Bayu (PLTB) di Pesisir Selatan Gorontalo
30	Q4 Jul 18 - Sep 18	UMGo	Research Report	Analisis Potensi tenaga Angin dii Wilayah Pesisir Selatan Kabupaten Gorontalo
31	Q4 Jul 18 - Sep 18	UMGo, UGM	Research Report	Modeling Energy Consumption in Gorontalo City Based Geographic Information System
32	Q4 Jul 18 - Sep 18	UMGo	Research Report	Pemanfaatan Energi Terbarukan di Gorontalo (Tinjauan Optimalisasi Potensi dan Implementasi Program)

33	Q4 Jul 18 - Sep 18	UGM	Research Report	Pemetaan Supply Chain Photovoltaic di Indonesia
34	Q4 Jul 18 - Sep 18	UGM	Research Report	Developing Sustainability Matrix for Proposed Energy System
35	Q4 Jul 18 - Sep 18	ITB	Research Report	Report on Developing Sustainability Matrix for Proposed Hybrid Energy System and Energy Efficienfy
36	Q4 Jul 18 - Sep 18	UMGo	Research Report	Pengetahuan Literasi Energi Tingkat Sekolah Menengah Atas di Kota Gorontalo
37	Q4 Jul 18 - Sep 18	UI	Research Report	Pemanfaatan Mikroalga Chlorella vulgaris Sebagai Pembuatan Bioplastik: Alternatif Kemasan Ramah Lingkungan
38	Q4 Jul 18 - Sep 18	UGM	Research Report	Developing Matrix of Women Role in Sustainability Design
39	Q4 Jul 18 - Sep 18	UGM, UI, ITB, IPB, UBB, UNG, UMGO	Video	Training on Buildings Energy Analysis by Prof. Mncef Krarti
40	Q4 Jul 18 - Sep 18	UGM, UI, ITB, IPB, UBB, UNG, UMGO	Video	CDSR One Year Achievement
41	Q2 Jan 19 - Mar 19	UGM	Video	Penelitian Nearly Zero Energy Building (nZEB) oleh Insgreeb
42	Q3 Apr 19 - Jun 19	UGM	Research Report	Sistem Pemantauan Energi Online pada Sistem PLTS di Karimunjawa dan Budidaya Mikroalga di Nogotirto Algae Park
43	Q3 Apr 19 - Jun 19	IPB	Research Report	Biomass Gasification for Electrification in Gunung Walat Educational Forest
44	Q3 Apr 19 - Jun 19	IPB	Research Report	Growth Performance of White Jabon (Neolamarckia cadamba (Robx.) Bosser) Provenance as Bioenergy in Parung Panjang, Bogor
45	Q3 Apr 19 - Jun 19	IPB	Research Report	Technical and Financial Feasibility Tests of Biomass-based Renewable Energy Development in Industrial Forest Plantation in Kalimantan
46	Q3 Apr 19 - Jun 19	IPB	Research Report	Economic Analysis of Wood Pellet Usage for Sustainable of Wood Pellet Production as Biomass Resources
47	Q3 Apr 19 - Jun 19	UBB	Research Report	Capacity Building for Vocational Schools in Bangka
48	Q3 Apr 19 - Jun 19	UI	Research Report	Extraction of Frankincense Essential Oil From Sytrax Sumatrana with Hydrodistillation Method for Antioxidant Activity Tesr

49	Q3 Apr 19 - Jun 19	UI	Research Report	Optimization of Oil Palm Empty Fruit Bunch Hydrolysis Process for Furfural Production on Pilot Scale with Response Surface Methodology
50	Q3 Apr 19 - Jun 19	UMGo	Research Report	The Mapping of Electricity Consumption in The Districts of Gorontalo Using Spatial Method
51	Q3 Apr 19 - Jun 19	UMGo	Research Report	Web-GIS Solar Panel Spreading Mapping for Sustainable Development Planning
52	Q3 Apr 19 - Jun 19	UMGo	Research Report	The Analysis Of Solar Power Plan Contribution To The Improvement Of Social Economic of Women In Rural Area
53	Q3 Apr 19 - Jun 19	UMGo	Research Report	Design and Prototype development of expert system of renewable energy
54	Q3 Apr 19 - Jun 19	UNG	Research Report	Investigate the prevalence of the idea of using renewable energy to teachers and students with the Rasch model analysis approach
55	Q3 Apr 19 - Jun 19	UNG	Research Report	Increasing non-Fossil Electrical Energy Sources Toward Near-Zero Energy Building (NZEB) in Gorontalo Province
56	Q3 Apr 19 - Jun 19	UNG	Research Report	Identification of Bioethanol from Corncobs in Gorontalo
57	Q4 Jul 19 - Sep 19	UBB	Video	Penelitian Energi Terbarukan oleh peneliti UBB
58	Q4 Jul 19 - Sep 19	ITB	Video	Penelitian Energy Building oleh CDSR-ITB
59	Q4 Jul 19 - Sep 19	ITB	Video	Peneliti muda CDSR-ITB
60	Q4 Jul 19 - Sep 19	UMGO	Video	Penelitian Energi Terbarukan oleh Peneliti UMGo
61	Q4 Jul 19 - Sep 19	UNG	Video	Penelitian Energi Terbarukan oleh peneliti UNG
62	Q4 Jul 19 - Sep 19	UGM	Booklet	July 2019 edition
63	Q4 Jul 19 - Sep 19	UGM	Booklet	February 2019 edition
64	Q4 Jul 19 - Sep 19	UGM	Booklet	Abstract Compilation update
65	Q4 Jul 19 - Sep 19	UGM	Research Report	Feasibility study (FS) of Microalgae Cultivation Facility in Semujur Island

66	Q4 Jul 19 - Sep 19	UGM	Research Report	Feasibility study (FS) of Microalgae Cultivation Facility in Gorontalo
67	Q4 Jul 19 - Sep 19	UGM	Research Report	Developing Design of Building Integrated Photovoltaic (BIPV) Supply Chain for Neraly Zero Energy Buildings (NZEBS) in Yogyakarta and Central Java
68	Q1 Oct 19 - Dec 19	UGM	Research Report	Developing method to achieve NZEB model for buildings in Yogyakarta and Bandung
69	Q1 Oct 19 - Dec 19	UGM	Research Report	Online Energy Monitoring System for UGM's Buildings
70	Q1 Oct 19 - Dec 19	ITB	Research Report	Developing design of supply chain and its supporting network for PV and biorefinery system in BIPV-NZEB
71	Q1 Oct 19 - Dec 19	UGM	Research Report	Microalgae Cultivation in Nogotirto Algae Park, Yogyakarta, Indonesia
72	Q1 Oct 19 - Dec 19	UGM	Booklet	December 2019 edition
73	Q3 Apr 20 - Jun 20	ITB	Research Report	Feasibility study (FS) and Detail Engineering Design (DED) for PV and bioenergy system in Bangka Belitung (Semujur Island) and Gorontalo (PIC: ITB)
74	Q3 Apr 20 - Jun 20	UBB	Research Report	Developing Spirulina sp. Culture in Universitas Bangka Belitung
75	Q3 Apr 20 - Jun 20	UGM	Research Report	Setup Sistem Energi Terbarukan untuk Memenuhi Kebutuhan Energi Listrik Minimum Rumah Tangga dengan Teknologi Berkelanjutan
76	Q3 Apr 20 - Jun 20	UGM	Research Report	Performance Analysis of Vertical Axis Wind Turbine (VAWT) on Building in Yogyakarta
77	Q3 Apr 20 - Jun 20	UGM, UI, ITB, IPB, UBB, UNG, UMGO, UCB	Video	Kolaborasi Membangun Wilayah yang Berkelanjutan
78	Q3 Apr 20 - Jun 20	UGM, UI, ITB, IPB, UBB, UNG, UMGO, UCB	Book	Collaboration for Sustainable Regional Development

NCSTT				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
1	Q4 Jul 17 - Sep 17	ITB	Guide or SOP	Keputusan Rektor ITB Tentang Pembentukan Tim Peneliti CCR-NCSTT Tentang SHERA
2	Q1 Oct 17 - Dec 17	ITB, ITK, UNDIP, ULM, UNSRAT, UNS, UNSRI, MIT	Guide or SOP	Standard Operating Procedure Penentuan Honor Peneliti
3	Q1 Oct 17 - Dec 17	UNS	Proceeding	Steering Characteristic of an Articulated Bus Under Quasi Steady Maneuvering
4	Q1 Oct 17 - Dec 17	ITB	Proceeding	Rectifier Substation Optimum Position on DC Traction Systems
5	Q1 Oct 17 - Dec 17	ITB	Proceeding	Extended Utilization of Electric Vehicles in Electrical Grid Services
6	Q1 Oct 17 - Dec 17	UNSRAT	Proceeding	Predicting Battery S Capacity Degradation Using Grey Model
7	Q1 Oct 17 - Dec 17	ITB	Proceeding	A New Simplified Cascaded Boost Converter for High Ratio and Low Ripple Application
8	Q1 Oct 17 - Dec 17	ITB	Proceeding	A New Speed Synchronization Technique for a Three PMSM
9	Q1 Oct 17 - Dec 17	ITB	Proceeding	Performance Evaluation of Large Ratio DC-DC Boost Converter
10	Q1 Oct 17 - Dec 17	ITB	Proceeding	Implementation of Model Predictive Control (MPC) in Electric Vehicle Testing Simulator
11	Q1 Oct 17 - Dec 17	ITB	Proceeding	Implementation of Sliding Mode Control Using Modification of Two-Steps LMI Approach for Speed Control of Electric Vehicle Simulator
12	Q1 Oct 17 - Dec 17	ITB	Proceeding	Torque Control Using Integrated Battery-Electric Vehicle Model with Flexible Shaft
13	Q1 Oct 17 - Dec 17	ITB	Proceeding	Preliminary Investigation on Combined Expansion Tube-Axial Splitting-Type Impact Energy Absorbers
14	Q1 Oct 17 - Dec 17	ITB	Proceeding	Testing of Dynamic Characteristic and Comfort of Indonesia Automated People Mover from Bandung

15	Q1 Oct 17 - Dec 17	ITB, UNPAR	Proceeding	Distributed Resilient Tracking Control of a Vehicle Platoon Under Communication Imperfection
16	Q1 Oct 17 - Dec 17	ITB	Proceeding	State of Energy (SOE) Estimation of LiNiCoAlO2 Battery Module Considering Cells Unbalance and Energy Efficiency
17	Q1 Oct 17 - Dec 17	ITB	Proceeding	Battery Module Performance Improvement Using Active Cell Balancing System Based on Switched-Capacitor Boost Converter (S-CBC)
18	Q1 Oct 17 - Dec 17	ITB	Proceeding	Development of Battery Thermal Management System for LiFeMnPO4 Module Using Air Cooling Method to Minimize Cell Temperature Differences and Parasitic Energy
19	Q1 Oct 17 - Dec 17	ITK	Proceeding	Design Car Braking System Using Mamdani Fuzzy Logic Control
20	Q1 Oct 17 - Dec 17	ITB	Proceeding	Implementation of Lane Detection Algorithm for Self-Driving Car on Toll Road Cipularang Using Python Language
21	Q1 Oct 17 - Dec 17	ITB	Proceeding	Implementation of Vehicle Detection Algorithm for Self-Driving Car on Toll Road Cipularang Using Python Language
22	Q1 Oct 17 - Dec 17	ITB	Proceeding	Synthesis of Aluminium-doped Spinel LiNi0. 5Mn1. 5O4 with Fe2O3 and Its Electrochemical Properties
23	Q1 Oct 17 - Dec 17	ITB	Proceeding	Preliminary Study of Electrical Conductivity and Electrochemical Properties of the Influence Copper Addition in Reduced Graphene Oxide (rGO)
24	Q1 Oct 17 - Dec 17	ITB	Proceeding	Modeling and Analysis of Cooling System Permanent Magnet Synchronous Motor 30 KW for City EV with FEM
25	Q1 Oct 17 - Dec 17	ITB	Proceeding	Thermal Modelling and Analysis Of75 KW Permanent Magnet Synchronous Motor for Medium Bus Application Based on JMAG
26	Q2 Jan 18 - Mar 18	ITB	Proceeding	Study on Capacity Calculation of Traction Substations LRT (Light Rapid Transit) Palembang Sumatera Selatan
27	Q2 Jan 18 - Mar 18	UNS	Paper	Role of Additives in Enhancing the Rheological Properties of Magnetorheological Solids: a Review
28	Q2 Jan 18 - Mar 18	UNS	Paper	A Comparative Work on the Magnetic Field- Dependent Properties of Plate-like and Spherical Iron Particle-based Magnetorheological Grease
29	Q3 Apr 18 - Jun 18	ULM	Paper	Vehicle Detection Using Background Subtraction and Clustering Algorithms

30	Q3 Apr 18 - Jun 18	UNDIP	Proceeding	Design and Fabrication of a Twist Fixture to Measure Torsional Stiffness of a Pick up Chassis
31	Q3 Apr 18 - Jun 18	UNS	Paper	Supplier Selection Model of the Lithium-ion Battery Using Fuzzy AHP and Analysis of BOCR
32	Q3 Apr 18 - Jun 18	ITB, UNDIP	Paper	Optimization of Bus Body Frame Structure for Weight Minimizing with Constraint of Natural Frequency Using Adaptive Single-Objective Method
33	Q3 Apr 18 - Jun 18	UNS	Paper	Mapping of Indbound Flows in Supply Chain of Lithium-ion Industry in Indonesia
34	Q3 Apr 18 - Jun 18	ITB	Paper	On the Lightweight Structural Design for Electric Road and Railway Vehicles Using Fiber Reinforced Polymer Composites - a Review
35	Q3 Apr 18 - Jun 18	ITB	Paper	Structural Optimizations of a 12/8 Swithced Reluctance Motor Using a Genetic Algorithm
36	Q3 Apr 18 - Jun 18	UNS	Paper	Lithium Titanate (LTO) Synthesis Through Solid State Reaction and Its Performance for LiFePO4/LTO Battery
37	Q3 Apr 18 - Jun 18	UNS	Paper	Constitutive Models of Magnetorheological Fluids Having Temperature-dependent Prediction Parameter
38	Q3 Apr 18 - Jun 18	UNS	Paper	Magnetorheological Elastomer Silicone-Based Containing Corroded Carbonyl Iron Particles
39	Q3 Apr 18 - Jun 18	UNS	Paper	The Field-dependent Viscoelastic and Transient Responses of Plate-Like- Carbonyl-Iron Particle-Based Magnetorheological Greases
40	Q3 Apr 18 - Jun 18	UNS	Paper	Performance of Magnetorheological Elastomer Based Silicone/SAIB
41	Q3 Apr 18 - Jun 18	UNS	Paper	Evaluation of an Electric Vehicle Ride Dynamics Under ISO-2631 Criteria
42	Q3 Apr 18 - Jun 18	UNS	Paper	Implementation of Functionalized Multiwall Carbon Nanotubes on Magnetorheological Elastomer
43	Q3 Apr 18 - Jun 18	UNS	Paper	Design and Fabrication of Magnetorheological Elastomer Vibration Isolator
44	Q3 Apr 18 - Jun 18	UNS	Paper	Simulation and Validation of an Anisotropic Magnetorheological Elastomers Mold with Various Alignment Angles
45	Q4 Jul 18 - Sep 18	ITB	Proceeding	Model Checking-based Safety Verification of a Petri Net Representation of Train Interlocking Systems

46	Q4 Jul 18 - Sep 18	ULM	Paper	Factor Analysis of the Influence of River Crossing Ferry Use - a Case in Banjarmasin and Kuala Kurun
47	Q4 Jul 18 - Sep 18	UNS	Paper	Frictional Characteristics of Friction Brake Material Using Cantala Fibers as Reinforcement
48	Q4 Jul 18 - Sep 18	ITB	Proceeding	Math Based Design for Manufacturing Application in the Development of Safe Vehicles
49	Q4 Jul 18 - Sep 18	ITB	Proceeding	Probabilistic Approach to Remaining Lifetime Estimation of Gears with Surface Pit Damages
50	Q4 Jul 18 - Sep 18	ITB	Proceeding	Application of Advanced Computational Mechanics for Industrial Case in Indonesia
51	Q4 Jul 18 - Sep 18	ITB	Proceeding	Microcrack Behaviour on Fractured Capsule in Encapsulation-Based Self-Healing Concrete Using Cohesive Zone Model
52	Q4 Jul 18 - Sep 18	ITB	Proceeding	Injury Biomechanics and Countermeasures Analysis of a Passenger Inside an Armoured Vehicle Subjected to an 8 Kg TNT of Lindmine
53	Q4 Jul 18 - Sep 18	ITB	Proceeding	Experimental Analysis of Multi-Corners Crash Box Subjected to Quasi-Static Axial Load
54	Q4 Jul 18 - Sep 18	ITB	Proceeding	An Investigation of M2 Steel Core Performance of 12. 7 Mm Armour-piercing Projectile Using Forward and Reverse Ballistic Experiments
55	Q4 Jul 18 - Sep 18	ITB	Proceeding	Development of Basic Surface Electromyography Signal Feature Extraction
56	Q4 Jul 18 - Sep 18	ITB	Proceeding	Investigation of Mechanical Locking Phenomenon at the Interface of Fiber and Matrix Composite
57	Q4 Jul 18 - Sep 18	ITB	Proceeding	Material Characterization and Numerical Simulation of Quasi-static Tensile Behaviors for Ultra High Strength Steel Material for Armored Fighting Vehicle (AFV)
58	Q4 Jul 18 - Sep 18	UNDIP	Proceeding	Torsional Stiffness Analysis of Electric Bus Chassis Using Finite Element Method
59	Q4 Jul 18 - Sep 18	ITB	Proceeding	Frame Model Analysis for an Electric Three-wheel Vehicle

60	Q1 Oct 18 - Dec 18	ITB, ITK, UNDIP, ULM, UNSRAT, UNS, UNSRI, MIT	Guide or SOP	Standard Operating Procedure Exchange Program
61	Q1 Oct 18 - Dec 18	ITB, ITK, UNDIP, ULM, UNSRAT, UNS, UNSRI, MIT	Guide or SOP	Standard Operating Procedure Conference Participation
62	Q1 Oct 18 - Dec 18	ITB	Video	The Seminar on Women Empowerment on Academic and Research Environment
63	Q1 Oct 18 - Dec 18	UNSRI	Research Report	Research Report - Gelam Wood Bark Carbon Nanosheet for Energy Storage Device - UNSRI
64	Q1 Oct 18 - Dec 18	UNSRI	Research Report	Research Report - Feeder Scenario to Support the Implementation of LRT in Palembang - UNSRI
65	Q1 Oct 18 - Dec 18	UNSRI	Research Report	Research Report - Feasibility Study on the Development of TODs Along the Palembang LRT Route - UNSRI
66	Q1 Oct 18 - Dec 18	ULM	Research Report	Research Report - Detection of Cracking on Road Flexible Pavement Using Image Processing - ULM
67	Q1 Oct 18 - Dec 18	ULM	Research Report	Research Report - Algorithm Development for Traffic Simulation - ULM
68	Q1 Oct 18 - Dec 18	UNS	Proceeding	Comparative Study of PWM Method for Optimal Energy Control of Railway Traction Motor
69	Q1 Oct 18 - Dec 18	ITB	Paper	Optimal Codesign of Industrial Networked Control Systems with State Dependent Correlated Fading Channels
70	Q1 Oct 18 - Dec 18	UNS	Proceeding	Model-Based Simulation for Hybrid Fuel Cell/Battery/Ultracapacitor Electric Vehicle
71	Q1 Oct 18 - Dec 18	UNS	Proceeding	Goal Programming Model for Capital Budgeting Investment of Lithium Accumulator Production Unit for Motorcycle
72	Q1 Oct 18 - Dec 18	UNS	Proceeding	Goldsmith S Commercialization Model for Feasibility Study of Technology Lithium Battery Pack Drone
73	Q1 Oct 18 - Dec 18	UNS	Proceeding	Comparative Study of NCA Cathode Material Synthesis Methods Towards Their Structure Characteristics

74	Q1 Oct 18 - Dec 18	UNS	Proceeding	Synthesis and Characterization of LiNi 0. 8 Co 0. 15 Al 0. 05 O 2 Cathode Material via Co-Precipitation Method with Green Chelating Agents
75	Q1 Oct 18 - Dec 18	UNSRI	Paper	A Review on Production of Hydrogen from Renewable Sources and Applications for Fuel Cell Vehicles
76	Q1 Oct 18 - Dec 18	ITB	Paper	Review of Switched Reluctance Motor Control for Acoustic Noise and Vibration Reduction
77	Q1 Oct 18 - Dec 18	UNS	Paper	Effect of Curing Current on Stiffness and Damping Properties of Magnetorheological Elastomers
78	Q1 Oct 18 - Dec 18	ITB	Paper	Transportation System Development and Challenge in Jakarta Metropolitan Area, Indonesia
79	Q1 Oct 18 - Dec 18	ITB	Paper	Train Localization Using Unscented Kalman Filter - Based Sensor Fusion
80	Q1 Oct 18 - Dec 18	ITB	Paper	Electrochemical Impedance Analysis of Polyvinylpyrrolidone-coated Sulfur/reduced Graphene Oxide (S/rGO) Electrode
81	Q1 Oct 18 - Dec 18	UNS	Paper	A Comparative Assessment of Different Dispersing Aids in Enhancing Magnetorheological Elastomer Properties
82	Q1 Oct 18 - Dec 18	UNS	Paper	Material Characterization of a Magnetorheological Fluid Subjected to Long-Term Operation in Damper
83	Q1 Oct 18 - Dec 18	ITB	Paper	The Influence of Copper Addition on the Electrical Conductivity and Charge Transfer Resistance of Reduced Graphene Oxide (rGO)
84	Q1 Oct 18 - Dec 18	UNS	Paper	Graphite/Li2ZrO3 Anode for a LiFePO4 Battery
85	Q1 Oct 18 - Dec 18	ITB	Proceeding	Static Analysis of an Electric Three Wheel Vehicle
86	Q1 Oct 18 - Dec 18	UNDIP	Proceeding	Dynamic Analysis of Electric Bus Chassis Using Finite Element Method
87	Q1 Oct 18 - Dec 18	ITB	Proceeding	On the Design of Electric Power Steering Control Unit
88	Q1 Oct 18 - Dec 18	ITB	Proceeding	Comparison of PID Controller Tuning Methods for Multi PMSM Angular Speed Synchronization
89	Q1 Oct 18 - Dec 18	ITB	Proceeding	Modification of Circular Radius, Arm Patch Line Width and Power Supply Line of UWB Double Layer Printed Antenna for Partial Discharge Detection

90	Q1 Oct 18 - Dec 18	UNS	Proceeding	Fabrication and Electrochemical of Lithium Iron Phosphate LiFePO4/C as Cathode Material of Lithium Ion Baterry
91	Q1 Oct 18 - Dec 18	ITB	Proceeding	Study and Design High Frequency Resonant Inductive Power Transfer for Application of Wireless Charging Electric Vehicles
92	Q1 Oct 18 - Dec 18	ITB	Proceeding	Li-ion NCA Battery Safety Assessment for Electric Vehicle Applications
93	Q1 Oct 18 - Dec 18	ITB	Proceeding	Composite Based Lightweight Structure Design for Crash and Safety Application
94	Q1 Oct 18 - Dec 18	UNS	Proceeding	Design Study in Single Disk Axial Eddy Current Brake
95	Q1 Oct 18 - Dec 18	UNS	Proceeding	A Review of Electric Vehicles Charging Standard Development: Study Case in Indonesia
96	Q1 Oct 18 - Dec 18	ITB	Proceeding	The Concept of Sandwich Panel Structures for Battery Protections in Electric Vehicles Subjected to Ground Impact
97	Q1 Oct 18 - Dec 18	ULM	Proceeding	Detection of Moving Vehicle Using Adaptive Threshold Algorithm on Varied Lighting
98	Q1 Oct 18 - Dec 18	UNS	Proceeding	Parametric Design in Single Disk Axial Eddy Current Brake
99	Q1 Oct 18 - Dec 18	ITB	Proceeding	A Stability Improvement of Rechargeable Zn-Air Batteries by Introducing Thiourea and Polyethylenimine as Electrolyte Additives
100	Q1 Oct 18 - Dec 18	ITB	Proceeding	Dimensional and Parametric Studies on Thermal Behavior of Li-Ion Batteries
101	Q1 Oct 18 - Dec 18	ITB	Proceeding	Development of Engine Power Capacity Calculation Method for Range Extender and Case Study in Medium-Size Electric Bus
102	Q1 Oct 18 - Dec 18	UNS	Proceeding	Model Based Simulation for Hybrid Fuel Cell/Battery/Ultracapacitor Electric Vehicle
103	Q1 Oct 18 - Dec 18	UNS	Proceeding	Real-Time Comparison of Electromechanical and Thyristor-Switched Capacitor Banks for Improving Power Factor in Lead-Acid Battery Manufacturing Industry
104	Q1 Oct 18 - Dec 18	UNDIP	Proceeding	Charging Quality of 100 Amperhours Battery Using a Silicon Photovoltaic at Different Altitude in Semarang Region

105	Q1 Oct 18 - Dec 18	ITB	Proceeding	A Study of a Three Phase Induction Motor Performances Controlled by Indirect Vector and Predictive Torque Control
106	Q1 Oct 18 - Dec 18	ITB	Proceeding	Study of Supercapacitor Utilization on Regenerative Braking System: Design and Simulation
107	Q1 Oct 18 - Dec 18	UNS	Proceeding	Optimal Placement of Unified Power Flow Controllers (UPFC) for Losses Reduction and Improve Voltage Stability Based on Sensitivity Analysis in 500 KV Java-Bali Electrical Power System
108	Q1 Oct 18 - Dec 18	ITB	Proceeding	Application of Wavelet Transformation Symlet Type and Coiflet Type for Partial Discharge Signals Denoising
109	Q1 Oct 18 - Dec 18	ITB	Proceeding	Port Container Truck Localization Using Sensor Fusion Technique
110	Q1 Oct 18 - Dec 18	ITB	Proceeding	Implementation IBEV Model and Its Speed Control Applications in Molina ITB for Energy Efficiency
111	Q1 Oct 18 - Dec 18	ITB	Proceeding	Nonlinear Stability Analysis of Vehicle Side-slip Dynamics Using SOS Programming
112	Q1 Oct 18 - Dec 18	ITB	Proceeding	Enhancing the Electrical Conductivity of Graphene Oxide Reduced by L-Ascorbic Acid via Microwave-Assisted Method
113	Q1 Oct 18 - Dec 18	ITB	Proceeding	Preliminary Study of Graphite Rod Pretreatment in H2O2/H2SO4 Mixture Solution on the Synthesized Graphene by Electrochemical Exfoliation Method
114	Q1 Oct 18 - Dec 18	UNS	Proceeding	Design and Optimization of Solar, Wind, and Distributed Energy Resource (DER) Hybrid Power Plant for Electric Vehicle (EV) Charging Station in Rural Area
115	Q1 Oct 18 - Dec 18	UNDIP	Proceeding	Modeling and Analysis of Lateral Control System on Electronic Differential for 2- Independent-Wheel-Drive Electric Urban Bus
116	Q1 Oct 18 - Dec 18	ITB	Proceeding	Development of Static and Dynamic Online Measurement System for Ground Vehicles
117	Q1 Oct 18 - Dec 18	ITB	Proceeding	Experimental Modeling of a Quadrotor UAV Using an Indoor Local Positioning System
118	Q1 Oct 18 - Dec 18	ITB	Proceeding	Optimal Control for Autonomous Navigation of a Truck System
119	Q1 Oct 18 - Dec 18	ITB	Proceeding	Robust Optimal Control for Train Operation of 2-Car AGT (Automated Guide-way Transit) in Automatic People Movers System

120	Q1 Oct 18 - Dec 18	ITB	Proceeding	Study in Capacity Calculation of Traction Substations LRT (Light Rapid Transit) Palembang Sumatera Selatan
121	Q2 Jan 19 - Mar 19	ITB	Video	Profile NCSTT 2019
122	Q2 Jan 19 - Mar 19	UNS	Paper	Material Characterizations of Gr-Based Magnetorheological Elastomer for Possible Sensor Applications: Rheological and Resistivity Properties
123	Q2 Jan 19 - Mar 19	UNS	Paper	Thermal Stability and Rheological Properties of Epoxidized Natural Rubber-Based Magnetorheological Elastomer
124	Q2 Jan 19 - Mar 19	UNS	Paper	The Field-dependent Rheological Properties of Plate-like Carbonyl Iron Particle-based Magnetorheological Elastomers
125	Q2 Jan 19 - Mar 19	UNS	Paper	Design and Simulation of a Combined Serpentine T-Shape Magnetorheological Brake
126	Q2 Jan 19 - Mar 19	UNS	Paper	The Effect of Particle Shapes on the Field-Dependent Rheological Properties of Magnetorheological Greases
127	Q2 Jan 19 - Mar 19	ITB, MIT	Research Report	MIT Milestone 1 Research Report - Evaluation of Crash Performance and Study of Possible Thermal Run-Away Under Frontal, Rear, and Side Collisions, as Well as Ground Impacts - Phase One
128	Q2 Jan 19 - Mar 19	UNS	Proceeding	Synthesis of LiNi0. 8Mn0. 1Co0. 1O2 Cathode Material by Hydrothermal Method for High Energy Density Lithium Ion Battery
129	Q3 Apr 19 - Jun 19	ITB, ITK, UNDIP, ULM, UNSRAT, UNS, UNSRI, MIT	Guide or SOP	Standard Operating Procedure Penentuan Insentif Produk Riset (Versi 3)
130	Q3 Apr 19 - Jun 19	ITB	Paper	Network Analysis of Intercity Bus Terminal and Inner-City Toll Road Development - the Case of Bandung City
131	Q3 Apr 19 - Jun 19	UNSRAT	Paper	Calibration of Traffic Incident Simulation Models Using Field Data
132	Q3 Apr 19 - Jun 19	ITB	Paper	Evaluation of Motorcycle Energy Consumption in Urban Traffic
133	Q3 Apr 19 - Jun 19	UNSRI	Paper	Module Stabilizing of Biocarbon Based Electrochemical Capacitor
134	Q3 Apr 19 - Jun 19	UNS	Paper	Performance Prediction of a Novel Modular Magnetorheological Damper for Seismic Building
135	Q3 Apr 19 - Jun 19	UNSRAT	Paper	Calibration of Traffic Incident Simulation Models Using Field Data

136	Q3 Apr 19 - Jun 19	ITB	Paper	Network Analysis of Intercity Bus Terminal Development - the Case of Bandung City
137	Q3 Apr 19 - Jun 19	ITK	Paper	Optimal Power Flow Considering Voltage Stability Using Chaotic Firefly Algorithm
138	Q3 Apr 19 - Jun 19	UNS	Proceeding	Optimal Energy Control of Railway Traction Motor: Comparative Study
139	Q3 Apr 19 - Jun 19	ITK	Paper	Optimal Power Flow with Considering Voltage Stability Using Chaotic Firefly Algorithm
140	Q4 Jul 19 - Sep 19	UNS	Paper	Material Characterization of Magnetorheological Elastomers with Corroded Carbonyl Iron Particles: Morphological Images and Field-dependent Viscoelastic Properties
141	Q4 Jul 19 - Sep 19	UNS	Paper	Characterization of Morphological and Rheological Properties of Rigid Magnetorheological Foams via in Situ Fabrication Method
142	Q4 Jul 19 - Sep 19	ITB	Proceeding	Structural Health Monitoring Development for Plain-Woven Carbon Fiber Reinforced Polymer
143	Q4 Jul 19 - Sep 19	ITB	Proceeding	Graphite Surface Profile with Different Polishing Treatment
144	Q4 Jul 19 - Sep 19	ITB	Paper	The Influence of Fiber-Surface Profile and Roughness to Fiber-matrix Interfacial Properties
145	Q4 Jul 19 - Sep 19	UNDIP	Proceeding	Synthesis of Activated Carbon/bismuth Oxide Composite and Its Characterization for Battery Electrode
146	Q4 Jul 19 - Sep 19	UNS	Proceeding	Placement Multi Flexible Alternating Current Transmission System (Facts): Static Var Compensator (Svc) And Static Synchronous Compensator (Statcom) For Improving Voltage Stability Of 500 Kv Java-Bali Electrical Power System
147	Q4 Jul 19 - Sep 19	UNS	Proceeding	Analysis Of Load Flow And Continuous Power Flow Method In Power System: A Case Study Of 500 Kv Java-Bali Electrical Power System
148	Q1 Oct 19 - Dec 19	UNSRI	Paper	Analysis of Feeder Needs to Support the Implementation of LRT in Palembang
149	Q1 Oct 19 - Dec 19	UNS	Paper	An Innovative Design of Magnetorheological Lateral Damper for Secondary Suspension of a Train
150	Q1 Oct 19 - Dec 19	ITB	Paper	Battery Cells for Electric Vehicles

151	Q1 Oct 19 - Dec 19	UNSRI	Paper	Electrochemical Evaluation of Lithium-Ion Battery with Anode of Layer-Reduced Biocarbon and Cathode of LiFePO4
152	Q1 Oct 19 - Dec 19	UNSRI	Paper	The Effects of Grain Size, Oxidizers and Catalysts on Band Gap Energy of Gelam-Wood Carbon
153	Q1 Oct 19 - Dec 19	ITB	Video	6th ICEVT 2019 Trailer
154	Q1 Oct 19 - Dec 19	UNS	Paper	Control Reference Parameter for Stance Assistance Using a Passive Controlled Ankle Foot Orthosis-A Preliminary Study
155	Q1 Oct 19 - Dec 19	UNS	Paper	Mini Review on the Design of Axial Type Eddy Current Braking Technology
156	Q1 Oct 19 - Dec 19	UNS	Paper	Enhancement of Viscoelastic and Electrical Properties of Magnetorheological Elastomers with Nanosized Ni-Mg Cobalt-Ferrites as Fillers
157	Q1 Oct 19 - Dec 19	ITB	Proceeding	Data-Driven Construction of Chemical Reaction Network Graph Using Constrained LASSO
158	Q1 Oct 19 - Dec 19	ITB	Proceeding	A Comparison Study of Modulation Techniques of Data Communication for HST in CBTC Systems
159	Q1 Oct 19 - Dec 19	ITB	Proceeding	Application of Sensor Fusion for Determining Position and Velocity of Automated People Mover System at Soekarno-Hatta Airport with Extended Kalman Filter
160	Q1 Oct 19 - Dec 19	ITB	Proceeding	Implementing Neuro Fuzzy Approach for Bus Arrival Time Prediction Using GPS Data
161	Q1 Oct 19 - Dec 19	ITB	Proceeding	Prototype of Programmable High Voltage Pulse Generator for Simulator NDT Based on Ultrasound Wave
162	Q1 Oct 19 - Dec 19	ITB	Proceeding	Modelling and Simulation 3D Ultrasound Wave Propagation Using K-space Pseudospectral Method in the Railway Track Geometry
163	Q1 Oct 19 - Dec 19	ITB	Proceeding	State of Charge (SoC) and State of Health (SoH) Estimation of Lithium-Ion Battery Using Dual Extended Kalman Filter Based on Polynomial Battery Model
164	Q1 Oct 19 - Dec 19	ITB	Proceeding	Design Control of Forward Motion of an Autonomous Truck-Trailer Using Lyapunov Stability Approach
165	Q2 Jan 20 - Mar 20	UNS	Proceeding	Designing Automatic Syringe Shaker as the Supporting Media for Method of Dissolved Gas Transformer Oil Analysis

166	Q2 Jan 20 - Mar 20	UNDIP	Proceeding	Design of DC Fast Charging Buck Converter for LFP Battery on Electric Car
167	Q2 Jan 20 - Mar 20	ITB	Proceeding	Automotive Real-Time Operating System in Vehicular Technology Progress Review
168	Q2 Jan 20 - Mar 20	ITB	Proceeding	Using Multi-Quadrotor System for Effective Road Mapping
169	Q2 Jan 20 - Mar 20	ITB	Proceeding	Using Particle Swarm and Brain Storm Optimization for Predicting Bus Arrival Time
170	Q2 Jan 20 - Mar 20	UNDIP	Proceeding	Real-Time Image Processing Method Using Raspberry Pi for a Car Model
171	Q2 Jan 20 - Mar 20	ITB	Proceeding	Estimation of Received Signal Power for 5G-Railway Communication Systems
172	Q2 Jan 20 - Mar 20	ITB	Proceeding	An Input-to-State Stable Implementation of Event-Triggered CBTC
173	Q2 Jan 20 - Mar 20	ITB	Video	Electric Vehicle for Goods Delivery (E-Trike)
174	Q2 Jan 20 - Mar 20	ITB, UNS	Prototype	Electric Trike Prototype - Urban Goods Delivery Vehicle
175	Q2 Jan 20 - Mar 20	ITK	Proceeding	Design of Five Stages Cockroft-Walton with Passive Filter
176	Q2 Jan 20 - Mar 20	UNDIP	Proceeding	Comparison Power Consumption 125 Watts Pump by Using AC and DC Based on Solar Energy
177	Q2 Jan 20 - Mar 20	ITB	Proceeding	Battery Discharging Temperature Prediction Using Holt's Double Exponential Smoothing
178	Q2 Jan 20 - Mar 20	ITB	Proceeding	Battery Thermal Characteristics Estimation Using Finite Element Method
179	Q2 Jan 20 - Mar 20	ITB	Proceeding	Simulation Study on Thermal Characteristics and Temperature Distribution of Lithium-Ion Battery Pack in Electric Trike
180	Q2 Jan 20 - Mar 20	UNS	Proceeding	The Effect of Air Gap on Braking Performance of Eddy Current Brakes on Electric Vehicle Braking System

181	Q2 Jan 20 - Mar 20	ULM	Proceeding	Road Crack Detection Using Support Vector Machine (SVM) and OTSU Algorithm
182	Q2 Jan 20 - Mar 20	ITB	Proceeding	Chaotic Behavior of Battery State of Health
183	Q2 Jan 20 - Mar 20	ITB	Proceeding	Battery Temperature Rate of Change Estimation by Using Machine Learning
184	Q2 Jan 20 - Mar 20	UNSRI	Proceeding	Preparation of Kerosene Soot Carbon Electrode and Its Application in Lithium Ion Battery
185	Q2 Jan 20 - Mar 20	ITB	Proceeding	Channel Measurement-based Ray-tracing Analysis for High Speed Railway Scenario at 800MHz
186	Q2 Jan 20 - Mar 20	ITB, UNDIP	Proceeding	Experimental Study on the Aerodynamic Performance of Autonomous Boat with Wind Propulsion and Solar Power
187	Q2 Jan 20 - Mar 20	ITB	Proceeding	System Identification of Switched Reluctance Motor (SRM) Using Black Box Method for Electric Vehicle Speed Control System
188	Q2 Jan 20 - Mar 20	ITB	Proceeding	Localization Method for Autonomous Car Using Virtual Sensing System
189	Q2 Jan 20 - Mar 20	ITB	Proceeding	Experimental Investigation on Implementing Autonomous Bus Control Using Lyapunov Approach
190	Q2 Jan 20 - Mar 20	ITB	Proceeding	Power Optimization of Electric Motor Using PID-Fuzzy Logic Controller
191	Q2 Jan 20 - Mar 20	ITB, UNDIP	Proceeding	The Effect of Vehicle Inertia on Regenerative Braking Systems of Pure Electric Vehicles
192	Q2 Jan 20 - Mar 20	UNS	Proceeding	Design of Battery Management System (BMS) for Lithium Iron Phosphate (LFP) Battery
193	Q2 Jan 20 - Mar 20	ITB	Proceeding	Design Study of Battery System Protection Structure Based on Hybrid Material Fiber Metal Laminate (FML)
194	Q2 Jan 20 - Mar 20	ITB	Proceeding	Development of Big Data Analytics Platform for Electric Vehicle Battery Management System
195	Q2 Jan 20 - Mar 20	UNS	Proceeding	Magnetostatic Simulation in a Novel Magnetorheological Elastomer Based Loudspeaker Surround

196	Q2 Jan 20 - Mar 20	UNS	Proceeding	Placement Static Var Compensator (SVC) for Improving Voltage Stability Based on Sensitivity Analysis: a Case Study of 500 KV Java-Bali Electrical Power System
197	Q2 Jan 20 - Mar 20	UNS	Proceeding	Experimental Method for Improving Efficiency on Photovoltaic Cell Using Passive Cooling and Floating Method
198	Q2 Jan 20 - Mar 20	UNS	Proceeding	Sensorless Control of Railway Traction Motor in the Energy Point of View
199	Q2 Jan 20 - Mar 20	UNS	Proceeding	Low Cost Charging Station for Electric Vehicle: Design and Prototyping
200	Q2 Jan 20 - Mar 20	ITB	Proceeding	Synthesis of Exfoliated Graphene as Anode Material Using a Modified Electrochemical Process
201	Q2 Jan 20 - Mar 20	ITB	Proceeding	Reducing Synthesis Time of LiNi0. 8Co0. 15Al0. 05O2 (NCA) Cathode Material by Microwave Heat Treatment
202	Q2 Jan 20 - Mar 20	ITB	Proceeding	Effect of NaTi2(PO4)3 Coating on Improving Capacity Retention of Li-rich Li1. 13Ni0. 2Co0. 2Mn0. 47O2 Cathode
203	Q2 Jan 20 - Mar 20	ITB	Proceeding	Development of Active Cell to Cell Battery Balancing System for Electric Vehicle Applications
204	Q2 Jan 20 - Mar 20	UNS	Proceeding	The Influence of Aluminum Conductor Shape Modification on Eddy-Current Brake Using Finite Element Method
205	Q2 Jan 20 - Mar 20	UNS	Proceeding	Characterization of Pole Location on Unipolar Axial Eddy Current Brake
206	Q2 Jan 20 - Mar 20	UNS	Proceeding	Energy Effectiveness of Advanced Vehicle for Urban Transportation
207	Q2 Jan 20 - Mar 20	UNS	Proceeding	PHEV Mode Selection Strategy for Full Battery Consumption and Known Traffic Condition on Intercity Commuting
208	Q2 Jan 20 - Mar 20	ITB	Proceeding	Sandwich Panel Composite Based Light-Weight Structure Design for Reserved Energy Storage System (RESS) Protection
209	Q2 Jan 20 - Mar 20	ITK	Proceeding	Machining Simulation of Ti-6Al-4V Alloy Using Finite Element Method (FEM)
210	Q2 Jan 20 - Mar 20	UNDIP	Proceeding	Design and Prototyping of an Electric City Car for Two Passengers

211	Q2 Jan 20 - Mar 20	ITB	Proceeding	Energy Consumption Simulation and Analysis of Rear-Driven Electric Bus with Regenerative Braking
212	Q2 Jan 20 - Mar 20	UNDIP	Proceeding	Side Collision Dynamic Analysis of Electric Bus Frame Using Finite Element Method
213	Q2 Jan 20 - Mar 20	ITB	Proceeding	Acceptance of Electric Vehicle in Indonesia: Case Study in Bandung
214	Q2 Jan 20 - Mar 20	UNS	Paper	Nonlinear Piezoresistive Behavior of Plain-Woven Carbon Fiber Reinforced Polymer Composite Subjected to Tensile Loading
215	Q2 Jan 20 - Mar 20	ITB, MIT	Research Report	MIT Milestone 3 Research Report - Evaluation of Crash Performance and Study of Possible Thermal Runaway Under Frontal, Rear, and Side Collisions, as Well as Ground Impact
216	Q2 Jan 20 - Mar 20	ITB, MIT	Research Report	MIT Milestone 2 Research Report - Computational and Failure Analysis on the Design of a Safe and Lightweight Battery Pack for Use in Small Urban Electric Vehicles.
217	Q3 Apr 20 - Jun 20	ITB	Paper	Numerical Modeling of Microcrack Behavior in Encapsulation-based Self-healing Concrete Under Uniaxial Tension
218	Q3 Apr 20 - Jun 20	UNS	Proceeding	Consumer Perception Analysis of Electric Car Vehicle in Indonesia
219	Q3 Apr 20 - Jun 20	UNDIP	Proceeding	Rollover Performance Analysis of Electric Bus Superstructure Frame with Alternative Material Using Finite Element Method
220	Q3 Apr 20 - Jun 20	ITB	Proceeding	Interface Damage Mechanics in Fiber Reinforced Plastic Composite - a Review
221	Q3 Apr 20 - Jun 20	ITB	Proceeding	Mechanical Properties of Pouch Battery Constituents
222	Q3 Apr 20 - Jun 20	UNS	Proceeding	Design and Economic Analysis of Floating PV-Wind Turbine Plant for Renewable Energy Supply in Indonesia
223	Q3 Apr 20 - Jun 20	UNS	Proceeding	Experimental Method for Improving Efficiency on Photovoltaic Cell with Using Floating Installation Method
224	Q3 Apr 20 - Jun 20	UNS	Proceeding	Design Close-Loop Control of BLDC Motor Speed Using Pid Method in Solar Power with Matlab/Simulink

225	Q3 Apr 20 - Jun 20	UNS	Proceeding	Placement Multi Flexible Alternating Current Transmission System (Facts): Static Var Compensator (SVC) and Static Synchronous Compensator (Statcom) for Improving Voltage Stability of 500 KV Java-Bali Electrical Power System
226	Q3 Apr 20 - Jun 20	UNS	Proceeding	Analysis of Load Flow and Continuous Power Flow Method in Power System: a Case Study of 500 KV Java-Bali Electrical Power System
227	Q3 Apr 20 - Jun 20	UNS	Proceeding	Markov Chain Analysis to Identify the Market Share Prediction of New Technology: a Case Study of Electric Conversion Motorcycle in Surakarta, Indonesia
228	Q3 Apr 20 - Jun 20	UNS	Proceeding	The Line Segmentation Algorithm of Indonesian Electronic Identity Card (E-KTP) for Data Digitization
229	Q3 Apr 20 - Jun 20	UNS	Proceeding	Plug-in Hybrid Electric Vehicle Mode Selection Strategy for Full Battery Consumption and Known Road Slope Condition
230	Q3 Apr 20 - Jun 20	ITB	Paper	The Effect of Transport Demand Management Policy on the Intention to Use Public Transport: a Case in Bandung, Indonesia

SMART CITY				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
1	Y1Q1 Oct 17 - Dec 17	UI	Bulletin	Panduan Program SMART CITY Bagi Dosen dan Mahasiswa Doktoral
2	Y1Q2 Jan 18 - Mar 18	UI	Video	Lokakarya Desain dan Metode Riset 2018
3	Y1Q2 Jan 18 - Mar 18	UI	Bulletin	Kaleidoskop SMART CITY 2017
4	Y1Q3 Apr 18 - Jun 18	UI	Book	Transportation for Livable Cities
5	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Water Resources Management
6	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Water Management

SMART CITY				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
7	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Urban and Regional Infrastructure Development (Technologies, Applications, and Management)
8	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Surface Water Management (A Handbook for SUDS)
9	Y1Q3 Apr 18 - Jun 18	UI	Book	Storing Energy (With Special Reference to Renewable Energy Sources)
10	Y1Q3 Apr 18 - Jun 18	UI	Book	Smart Cities and Homes (Key Enabling Technologies)
11	Y1Q3 Apr 18 - Jun 18	UI	Book	Smart Cities (Foundations, Principles, and Applications)
12	Y1Q3 Apr 18 - Jun 18	UI	Book	Renewable Energy Systems (A Smart Energy Systems Approach to the Choice and Modeling of 100 Renewable Solutions)
13	Y1Q3 Apr 18 - Jun 18	UI	Book	Re-Framing Urban Space (Urban Design for Emerging Hybrid and High-Density Conditions)
14	Y1Q3 Apr 18 - Jun 18	UI	Book	Public Health Nursing (Population-centered Health Care in the Community)
15	Y1Q3 Apr 18 - Jun 18	UI	Book	Low Carbon Cities (Transforming Urban Systems)
16	Y1Q3 Apr 18 - Jun 18	UI	Book	Handbook of Research on Social, Economic, and Environmental Sustainability in the Development of Smart Cities
17	Y1Q3 Apr 18 - Jun 18	UI	Book	Faster, Smarter, Greener (The Future of the Car and Urban Mobility)
18	Y1Q3 Apr 18 - Jun 18	UI	Book	Electrochemical Energy (Advanced Materials and Technologies)
19	Y1Q3 Apr 18 - Jun 18	UI	Book	Digital and Smart Cities
20	Y1Q3 Apr 18 - Jun 18	UI	Book	Development Paradigms for Urban Housing in BRICS Countries

SMART CITY				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
21	Y1Q3 Apr 18 - Jun 18	UI	Book	Cultural Sustainability and Regional Development (Theories and Practices of Territorialisation)
22	Y1Q3 Apr 18 - Jun 18	UI	Book	Community-Oriented Health Services (Practices Across Disciplines)
23	Y1Q3 Apr 18 - Jun 18	UI	Book	Analytics for the Internet of Things (IoT) (Intelligent Analytics for Your Intelligent Devices
24	Y1Q3 Apr 18 - Jun 18	UI	Book	Use, Operation and Maintenance of Renewable Energy Systems (Experiences and Future Approaches)
25	Y1Q3 Apr 18 - Jun 18	UI	Book	Urban Water Sustainability (Constructing Infrastructure for Cities and Nature)
26	Y1Q3 Apr 18 - Jun 18	UI	Book	Urban Health in Developing Countries (Progress and Prospects)
27	Y1Q3 Apr 18 - Jun 18	UI	Book	Urban Water Security
28	Y1Q3 Apr 18 - Jun 18	UI	Book	Urban Housing Policy
29	Y1Q3 Apr 18 - Jun 18	UI	Book	Urban Infrastructure in Transition (Networks, Buildings and Plans)
30	Y1Q3 Apr 18 - Jun 18	UI	Book	Urban Infrastructure (Finance and Management)
31	Y1Q3 Apr 18 - Jun 18	UI	Book	Urban Energy Systems (An Integrated Approach)
32	Y1Q3 Apr 18 - Jun 18	UI	Book	Transforming Urban Transport (The Ethics, Politics, and Practices of Sustainable Mobility)
33	Y1Q3 Apr 18 - Jun 18	UI	Book	The Security of Water, Food, Energy and Liveability of Cities (Challenges and Opportunities for Peri-Urban Futures)

SMART CITY				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
34	Y1Q3 Apr 18 - Jun 18	UI	Book	The Internet of Things (IoT) (Applications, Technology, and Privacy Issues)
35	Y1Q3 Apr 18 - Jun 18	UI	Book	The Internet of Things (Enabling Technologies, Platforms, and Use Cases)
36	Y1Q3 Apr 18 - Jun 18	UI	Book	The Innovator's Dilemma: when New Technologies Cause Great Firms to Fail
37	Y1Q3 Apr 18 - Jun 18	UI	Book	The City of Tomorrow (Sensors, Networks, Hackers, and the Future of Urban Life)
38	Y1Q3 Apr 18 - Jun 18	UI	Book	The Challenge of Making Cities Liveable in East Asia
39	Y1Q3 Apr 18 - Jun 18	UI	Book	SYNER-G (Systemic Seismic Vulnerability and Risk Assessment of Complex Urban, Utility, Lifeline Systems and Critical Facilities)
40	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Urban Transport
41	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Water Management in Urban Environments
42	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Urban Water Environment (Climate, Pollution, and Adaptation)
43	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Urban Transport Financing from the Sidewalk to the Subway (Capital, Operations, and Maintenance Financing)
44	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Smart Cities (The Internet of Things, People and Systems)
45	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Smart Cities (Creating Spaces for Technological, Social, and Business Development)
46	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Urban Energy Policy (Heat and the City)

SMART CITY				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
47	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Mass Transit (Challenges and Opportunities in Urban Public Transportation)
48	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Energy Technology and Policies (A Transformational Journey) Vol. 2
49	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Development Research in the Asia-Pacific Region (Education, Cities, Infrastructure, and Buildings)
50	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Innovation and Regional Development (Rethinking Innovative Milieus)
51	Y1Q3 Apr 18 - Jun 18	UI	Book	Sustainable Communities and Urban Housing
52	Y1Q3 Apr 18 - Jun 18	UI	Book	Smart Energy in the Smart City (Urban Planning for a Sustainable Future)
53	Y1Q3 Apr 18 - Jun 18	UI	Book	Smart City Networks (Through the Internet of Things)
54	Y1Q3 Apr 18 - Jun 18	UI	Book	Smart Cities (Applications, Technologies, Standards, and Driving Factors)
55	Y1Q3 Apr 18 - Jun 18	UI	Book	Rural Populations and Health (Determinants, Disparities, and Solutions)
56	Y1Q3 Apr 18 - Jun 18	UI	Book	Resilient Sustainable Cities (A Future)
57	Y1Q3 Apr 18 - Jun 18	UI	Book	Renewable Energy Integration (Practical Management of Variability, Uncertainty, and Flexibility in Power Grids)
58	Y1Q3 Apr 18 - Jun 18	UI	Book	Regional Growth and Sustainable Development in Asia
59	Y1Q3 Apr 18 - Jun 18	UI	Book	Reconnecting People and Water (Public Engagement and Sustainable Urban Water Management)

SMART CITY				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
60	Y1Q3 Apr 18 - Jun 18	UI	Book	Practical Statistics for Data Scientists (50 Essential Concepts)
61	Y1Q3 Apr 18 - Jun 18	UI	Book	Planning Sustainable Cities and Regions (Towards More Equitable Development)
62	Y1Q3 Apr 18 - Jun 18	UI	Book	Paradigm Shift in Urban Mobility (Towards Factor 10 of Automobility)
63	Y1Q3 Apr 18 - Jun 18	UI	Book	Operation, Planning, and Analysis of Energy Storage System in Smart Energy Hubs
64	Y1Q3 Apr 18 - Jun 18	UI	Book	Managing Community Health Services
65	Y1Q3 Apr 18 - Jun 18	UI	Book	Low Carbon Urban Infrastructure Investment in Asian Cities
66	Y1Q3 Apr 18 - Jun 18	UI	Book	Low-Carbon Smart Cities (Tools for Climate Resilience Planning)
67	Y1Q3 Apr 18 - Jun 18	UI	Book	Life Cycle Approaches to Sustainable Regional Development
68	Y1Q3 Apr 18 - Jun 18	UI	Book	Internet of Things and Smart Environment (Assistive Technologies for Disability, Dementia, and Aging)
69	Y1Q3 Apr 18 - Jun 18	UI	Book	Internet-of-Things (IoT) Systems (Architectures, Algorithms, Methodologies)
70	Y1Q3 Apr 18 - Jun 18	UI	Book	Hybrid Energy Systems: Driving Reliable Renewable Sources of Energy Storage
71	Y1Q3 Apr 18 - Jun 18	UI	Book	Handbook on Green Infrastructure: Planning, Design and Implementation
72	Y1Q3 Apr 18 - Jun 18	UI	Book	Handbook of Environmental Health (Volume 2)

SMART CITY				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
73	Y1Q3 Apr 18 - Jun 18	UI	Book	Game Theory Solutions for Internet of Things: Emerging Research and Opportunities
74	Y1Q3 Apr 18 - Jun 18	UI	Book	From Smart Grids to Smart Cities (New Challenges in Optimizing Energy Grids)
75	Y1Q3 Apr 18 - Jun 18	UI	Book	From Smart City to Region (Digital Services for an Internet of Places)
76	Y1Q3 Apr 18 - Jun 18	UI	Book	Fabricating Architecture (Selected Readings in Digital Design and Manufacturing)
77	Y1Q3 Apr 18 - Jun 18	UI	Book	Energizing Sustainable Cities (Assessing Urban Energy)
78	Y1Q3 Apr 18 - Jun 18	UI	Book	Energy Storage for Sustainable Microgrid
79	Y1Q3 Apr 18 - Jun 18	UI	Book	Energy Storage (Systems and Components)
80	Y1Q3 Apr 18 - Jun 18	UI	Book	Connected Environments for the Internet of Things
81	Y1Q3 Apr 18 - Jun 18	UI	Book	City Competitiveness and Improving Urban Subsystems: Technologies and Applications
82	Y1Q3 Apr 18 - Jun 18	UI	Book	Cities for Smart Environmental and Energy Future (Impacts on Architecture and Technology)
83	Y1Q3 Apr 18 - Jun 18	UI	Book	Building Bottom-Up Health and Disaster Risk Reduction Programmes
84	Y1Q3 Apr 18 - Jun 18	UI	Book	Big Data Analytics with R (Leverage R Programming to Uncover Hidden Patterns in Your Big Data)
85	Y1Q3 Apr 18 - Jun 18	UI	Book	Big Data Analytics for Connected Vehicles for Smart Cities

SMART CITY				
No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
86	Y1Q3 Apr 18 - Jun 18	UI	Book	Beyond Smart Cities (How Cities Network, Learn, and Innovate)
87	Y1Q3 Apr 18 - Jun 18	UI	Book	Affordable Housing in the Urban Global South
88	Y1Q3 Apr 18 - Jun 18	UI	Paper	Proliferative Diabetic Retinopathy: an Overview of Vitreous Immune and Biomarkers
89	Y1Q3 Apr 18 - Jun 18	UI	Video	Scientific Article Academic Writing Workshop
90	Y1Q3 Apr 18 - Jun 18	UI	Video	Grid Smartness Achieved Through Forecasting and Energy Storage
91	Y1Q4 Jul 18 - Sep 18	UI	Poster	Shifted Beam Microstrip Array Antenna for Velocity Detection Radar
92	Y1Q4 Jul 18 - Sep 18	UI	Poster	Analysis of the Effect of Overflow Leakage Phenomenon Towards Archimedes Turbine Efficiency
93	Y1Q4 Jul 18 - Sep 18	UI	Video	The 5th EPES Seminar Series on Electrical Power and Energy
94	Y1Q4 Jul 18 - Sep 18	UI	Video	Workshop on Electrochemical Energy Materials and Device
95	Y1Q4 Jul 18 - Sep 18	UI	Video	Journal Writing for International Publications
96	Y1Q4 Jul 18 - Sep 18	UI	Book	Desain dan Metode Riset
97	Y1Q4 Jul 18 - Sep 18	UI	Book	Panduan Penulisan Akademis
98	Y1Q4 Jul 18 - Sep 18	UI	Booklet	Company Profile of SMART CITY Center for Collaborative Research
99	Y1Q4 Jul 18 - Sep 18	UI	Booklet	1 Year SMART CITY (July 2017 - June 2018)
100	Y2Q1 Oct 18 - Dec 18	UI	Policy Brief	Penelitian Sektor Perekonomian Kota Serang

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No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
101	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Scientific Article Structure
102	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Improving Academic Writing Style and General Writing Mistakes
103	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Dealing with Journals & Publisher
104	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Introduction to Academic Writing
105	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Understanding Publication Process
106	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Academic Integrity: Copyright, Referencing, and Plagiarism
107	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Sustainable Community and Infrastructure Development
108	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Women in Wildlife Conservation: a Missing Majority
109	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Sustainable Energy, Infrastructure and Design: Challenges and Opportunities
110	Y2Q1 Oct 18 - Dec 18	UF	Presentation Material	Research Agenda Modeling, Simulation & Visualization of Smart Cities
111	Y2Q1 Oct 18 - Dec 18	UI	Presentation Material	Peran Perempuan di Dalam Dunia Teknologi Informasi di Indonesia: Tantangan dan Perjuangan
112	Y2Q1 Oct 18 - Dec 18	UNPAD, UI	Booklet	Abstract Book ICSCI 2018 di Bandung (diselenggarakan UNPAD)
113	Y2Q2 Jan 19 - Mar 19	UI	Patent	Lipase Biocatalyst Immobilization from Solid State Fermentation of Palm Oil Empty Fruit Bunches, Bagasse, and Palm Oil Sludge with Adsorption-Cross Linking Method in Anion Macroporous Resin

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No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
114	Y2Q2 Jan 19 - Mar 19	UF	Presentation Material	Project Management, Forms of Approval, Budget & Other Supports
115	Y2Q2 Jan 19 - Mar 19	AAMU	Presentation Material	Sinergi Ilmuwan Diaspora Dalam Pengembangan Riset di Indonesia
116	Y2Q2 Jan 19 - Mar 19	UF	Presentation Material	Evidence-based Research Design
117	Y2Q2 Jan 19 - Mar 19	UIUC	Presentation Material	Design in Practice
118	Y2Q2 Jan 19 - Mar 19	UIUC	Presentation Material	Finding Development in U. S. Economic Development
119	Y2Q2 Jan 19 - Mar 19	UIUC	Presentation Material	The Making and Remaking of Chicago's Third Ghetto
120	Y2Q2 Jan 19 - Mar 19	UI	Book	Insentive Book of 2018
121	Y2Q2 Jan 19 - Mar 19	UI	Booklet	Kaleidoskop SMART CITY 2018
122	Y2Q2 Jan 19 - Mar 19	UI	Booklet	Company Profile of SMART CITY Center for Collaborative Research
123	Y2Q3 Apr 19 - Jun 19	UNSRI	Presentation Material	Story Telling by Pirzi Doll, a Method for Increasing Children's Knowledge and Attitude in Balanced Nutrition
124	Y2Q3 Apr 19 - Jun 19	UNSRI	Presentation Material	Empowerment Program Implementation on Small and Medium Businesses Positively Influenced the Performance of the Businesses
125	Y2Q3 Apr 19 - Jun 19	UNSRI	Presentation Material	Learning About Crime (A Study on Children in Conflict with the Law at LPKA Palembang)
126	Y2Q3 Apr 19 - Jun 19	UNSRI	Presentation Material	Factors Determining Drug Uptake During Mass Drug Administration (MDA) in Banyuasin District
127	Y2Q3 Apr 19 - Jun 19	UNSRI	Presentation Material	The External Factors Associated with Stunting Occurrence Among 12-59 Months Toddler in Rural Areas of Ogan Ilir District

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No.	**Period**	**Institutions Involved**	**Product Type**	**Title of Knowledge Product** *URL Provided, where applicable/available*
128	Y2Q3 Apr 19 - Jun 19	UI	Poster	Kinetic of Rice Husk Oil Oxidation by Using Laccase Enzyme
129	Y2Q3 Apr 19 - Jun 19	UI	Research Report	Laporan Penelitian Dr. Eng. Muhammad Sahlan
130	Y2Q3 Apr 19 - Jun 19	UI	Research Report	Laporan Penelitian Prof Widodo
131	Y2Q4 Jul 19 - Sep 19	UNUD	Book	Teknik Optimasi
132	Y3Q1 Oct 19 - Dec 19	UI	Patent	Software Segmentasi Semantik pada Data Point Cloud Menggunakan Deep Learning
133	Y3Q1 Oct 19 - Dec 19	UI	Patent	Software Identifikasi Bangunan pada Data Lidar Menggunakan Pengolahan Citra
134	Y3Q1 Oct 19 - Dec 19	UI	Research Report	Laporan Penelitian Ardiansyah, Ph. D.
135	Y3Q1 Oct 19 - Dec 19	UI	Research Report	Laporan Penelitian Prof. Paramita Atmodiwirjo
136	Y3Q1 Oct 19 - Dec 19	UI	Research Report	Laporan Penelitian Prof. Murdhani

Annex VII: SHERA Media Coverage

No.	Date	Media Outlet	Title of Article	Media Type	URL (Where Applicable)
1	15-Dec-16	Koran Banten	USAID Beri Bantuan 212 Juta Dollar Untuk Riset dan Pendidikan	Online	http://koranbanten.com/usaid-beri-bantuan-212-juta-dolar-untuk-riset-dan-pendidikan
2	21-Mar-17	jpnn.com	5 PTN Indonesia Kolaborasi Dengan 8 Kampus Top AS	Online	http://m.jpnn.com/news/5-ptn-indonesia-kolaborasi-dengan-8-kampus-top-as
3	21-Mar-17	Pikiran Rakyat	Amerika Serikat Mitra Empat Universitas di Jawa Barat	Online	http://www.antaranews.com/en/news/110045/indonesia-us-launch-20-million-research-program
4	21-Mar-17	Republika	AS Kuncurkan Dana Riset 20 juta untuk 5 Kampus di Indonesia	Online	http://www.republika.co.id/berita/pendidikan/dunia-kampus/17/03/21/on5vkf368-as-kucurkan-dana-riset-20-juta-dolar-untuk-5-kampus-di-indonesia
5	21-Mar-17	Dikti	Sudah Saatnya Riset Untuk di Implementasi	Online	http://www.dikti.go.id/sudah-saatnya-riset-untuk-di-implementasi/
6	5-Sep-17	ui.ac.id	Improving Higher Education Research, Indonesia & US Launched USAID SHERA Program	Online	http://www.ui.ac.id/en/news/improving-higher-education-research-indonesia-and-us-launched-usaid-shera-program-2.html
7	13-Sep-17	PSE UGM	Penandatanganan MOU Tujuh Universitas untuk Kerjasama Penelitian Energi Terbarukan, Lingkungan & Kemaritiman	Online	https://pse.ugm.ac.id/penandatanganan-mou-tujuh-universitas-untuk-kerjasama-penelitian-energi-terbarukan-lingkungan-dan-kemaritiman/
8	5-Oct-17	Unpatti	Kunjungan Direktur CCR ARI Universitas Pattimura	Online	https://unpatti.ac.id/berita/kunjungan-direktur-ccr-ari/
9	16-Oct-17	Tempo	Dengue Fever Vaccine Available in Indonesia	Online	https://en.tempo.co/read/news/2016/10/17/310812742/Dengue-Fever-Vaccine-Available-in-Indonesia
10	16-Oct-17	BBC	Pemerintah Dianggap Lemah Dalam Mewajibkan Orang Tua Memberikan Imunisasi	Online	http://www.bbc.com/indonesia/indonesia-41626425
11	23-Oct-17	Antara	UI Gagas Program SMART CITY	Online	http://www.antaranews.com/berita/660432/ui-gagas-program-smart-city
12	23-Oct-17	Warta Kota	UI, Kemristekdikti, dan USAID Gagas Program SMART CITY	Online	http://wartakota.tribunnews.com/2017/10/23/ui-kemenristekdikti-dan-usaid-gagas-program-smart-city

No.	Date	Media Outlet	Title of Article	Media Type	URL (Where Applicable)
13	24-Oct-17	Bisnis Jakarta	Bangun SMART CITY, Depok Klaim Banyak Dapat Dukungan	Online	https://bisnisjakarta.co.id/2017/10/24/bangun-smart-city-depok-klaim-dapat-banyak-dukungan/
14	24-Oct-17	Netral News	Lima Universitas Dukung Jakarta Jadi "SMART CITY"	Online	http://www.netralnews.com/news/kesra/read/109786/lima.universitas.dukung.jakarta.jadi....
15	25-Oct-17	Depok Pos	Walikota Depok " Smart People Elemen Terpenting dari Smart City"	Online	http://www.depokpos.com/arsip/2017/10/idris-smart-people-elemen-terpenting-smart-city/
16	26-Oct-17	Berita Satu	UI & Pemkot Depok Lakukan Riset SMART CITY	Online	http://www.beritasatu.com/jakarta/460231-ui-dan-pemkot-depok-lakukan-riset-smart-city.html
17	21-Nov-17	RMOL	ITB Pimpin Konsorsium Pengembangan Mobil Listrik	Online	http://www.rmoljabar.com/read/2017/11/21/60636/ITB-Pimpin-Konsorsium-Pengembangan-Mobil-Listrik-
18	7-Feb-18	itb.ac.id	Sigit Puji Santosa: Sistem Transportasi Berkelanjutan untuk Tingkat Daya Saing Bangsa	Online	https://www.itb.ac.id/news/read/56538/home/sigit-puji-santosa-sistem-transportasi-berkelanjutan-untuk-tingkat-daya-saing-bangsa
19	7-Feb-18	Solopos	UNDIP kembangkan bus listrik	Online	http://www.solopos.com/2018/02/08/kampus-di-semarang-undip-kembangkan-bus-listrik-892403
20	8-Feb-18	ugm.ac.id	Gandeng SMKN 2 Pangkal Pinang - Riset Kolaborasi dan Motivasi	Online	https://tf.ugm.ac.id/gandeng-smkn-2-pangkal-pinang-riset-kolaborasi-dan-motivasi/
21	22-Feb-18	Kompas	ITB dan MIT bekerja sama dalam penelitian baterai mobil listrik nasional	Online	https://regional.kompas.com/read/2018/02/23/12334141/itb-dan-mit-bekerja-sama-dalam-penelitian-baterai-mobil-listrik-nasional
22	5-Mar-18	Radar Gorontalo	Kerjasama Program USAID SHERA, Action!	Newspaper	N/A
23	10-Jul-18	Tribun News	Amerika Serikat dan Indonesia Dorong Kemitraan Penelitian Universitas	Online	http://www.tribunnews.com/pendidikan/2018/07/10/amerika-serikat-dan-indonesia-dorong-kemitraan-penelitian-universitas
24	10-Jul-18	Warta Jakarta	AS dan Indonesia Dorong Kemitraan Penelitian Unibversiras Bidik Sektor Swasta	Online	http://wartajakarta.com/news-10155-as-dan-indonesia-dorong-kemitraan-penelitian-universitas-bidik-sektor-swasta-.html
25	10-Jul-18	possore.com	Indonesia Dorong Kemitraan Penelitian Universitas dan Kolaborasi Sektor Swasta	Online	https://possore.com/2018/07/10/indonesia-dorong-kemitraan-penelitian-universitas-dan-kolaborasi-sektor-swasta/

No.	Date	Media Outlet	Title of Article	Media Type	URL (Where Applicable)
26	10-Jul-18	Antara	IPB Tuan Rumah Konferensi Kolaborasi USAID SHERA IPB	Online	https://megapolitan.antaranews.com/berita/41418/ipb-tuan-rumah-konferensi-kolaborasi-usaid-shera-ipb
27	10-Jul-18	Antara	Kemristekdikti Perkuat Kerja Sama Bilateral Bidang Riset	Online	https://megapolitan.antaranews.com/berita/41425/kemenristekdikti-perkuat-kerja-sama-bilateral-bidang-riset
28	10-Jul-18	Industry	USAID Berikan Bantuan USD 20 Juta untuk Riset dan Pendidikan	Online	http://www.industry.co.id/read/37720/usaid-berikan-bantuan-us-20-juta-untuk-riset-dan-pendidikan#.W0R7XW1AjNM.whatsapp
29	10-Jul-18	Sindo News	USAID SHERA Hibah Dana Riset USD 20 Juta untuk 5 Kampus Indonesia	Online	https://nasional.sindonews.com/read/1320566/144/usaid-shera-hibah-dana-riset-usd20-juta-untuk-5-kampus-indonesia-1531224665
30	11-Jul-18	Harian Kompas	20 Juta Dollar dari Amerika Serikat untuk Indonesia	Newspaper	N/A
31	11-Jul-18	KR Jogya	Kemristekdikti Perkuat Kerja Sama Riset Bilateral	Online	http://krjogja.com/web/news/read/71500/Kemenristekdikti_Perkuat Kerjasama_Riset_Bilateral
32	11-Jul-18	Media Indonesia	Kolaborasi RI-AS Targetkan Inovasi Aplikatif	Newspaper	N/A
33	11-Jul-18	Tribun Jogya	Konferensi Kolaborasi untuk Inovasi digelar di Pusat Konvensi Internasional Institut Pertanian Bogor	Online	http://jogja.tribunnews.com/2018/07/11/konferensi-kolaborasi-untuk-inovasi-digelar-di-pusat-konvensi-internasional-institut-pertanian-bogor
34	11-Jul-18	The Jakarta Post	US, Indonesia Encourage University Research Partnership	Online	http://www.thejakartapost.com/news/2018/07/11/us-indonesia-encourage-university-research-partnerships.html
35	12-Jul-18	detik.com	Ini Anggota Baru Majelis Wali Amanat IPB	Online	https://news.detik.com/berita/d-4111609/ini-anggota-baru-majelis-wali-amanat-ipb
36	13-Jul-18	The Jakarta Post	USAID, Ministry Organize Conference on Agricultural Innovation	Online	https://www.thejakartapost.com/news/2018/07/13/usaid-ministry-organize-conference-agricultural-innovation.html
37	16-Jul-18	Harian Pelita	Kampus Indonesia Dapat Dana Riset 20 Juta AS	Newspaper	N/A
38	20-Jul-18	Metro TV	Jakarta Perlu Buat Pusat Kontrol dan Analisis Lalu Lintas	Online	http://m.metrotvnews.com/news/metro/5b2VLErb-jakarta-perlu-pusat-kontrol-dan-analisis-lalu-lintas

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39	25-Jul-18	Tribun News	Di Konferensi Tahunan Pertama USAID, Sektor-Sektor ini yang Ingin Dibangan AS dan Indonesia	Online	http://jabar.tribunnews.com/2018/07/25/di-konferensi-tahunan-pertama-usaid-sektor-sektor-ini-yang-ingin-didorong-as-dan-indonesia
40	10-Aug-18	IDN Times	RITECH EXPO 2018 Teknologi Terbesar di Indonesia	Online	https://www.idntimes.com/tech/trend/muhammad-harits/ritech-expo-2018-pameran-hari-kebangkitan-teknologi-nasional/full
41	20-Aug-18	Antara	Pakar: Bioteknologi Penting ntuk Pertanian Indonesia	Online	https://www.antaranews.com/berita/739421/pakar-bioteknologi-penting-untuk-pertanian-indonesia
42	20-Aug-18	Neraca	Ribetnya Regulasi Hambat Teknologi Sektor Pertanian Nasional Tidak Berkembang	Online	http://www.neraca.co.id/article/105169/ribetnya-regulasi-hambat-teknologi-sektor-pertanian-nasional-tidak-berkembang
43	25-Aug-18	Babel Pos	Program USAID dan UBB Bicara Bangunan dan Energi	Online	N/A, link broken
44	3-Oct-18	Jakarta Post	Government Told Boost Fisheries Research	Online	https://www.thejakartapost.com/news/2018/10/03/govt-told-boost-fisheries-research.html
45	9-Oct-18	Mother & Baby	Bahaya Infeksi Pneumokokus pada Bayi	Online	https://www.motherandbaby.co.id/article/2018/10/9/10981/Bahaya-Infeksi-Pneumokokus-pada-Bayi
46	11-Oct-18	Beritagar	Bisakah Hidup Tanpa Vaksin?	Online	https://beritagar.id/artikel/berita/bisakah-hidup-tanpa-vaksin
47	20-Oct-18	Tribun Kupang	Mengenal Sistem Pertanian Lahan Kering di NTT ala Makasiswa FKH UNDANA	Online	http://kupang.tribunnews.com/2018/10/20/mengenal-sistem-pertanian-lahan-kering-di-ntt-ala-mahasiswa-fkh-undana-kupang
48	25-Oct-18	UNPAD	Gubernur Jawa Barat Harapkan Peran Akademisi Wujudkan SMART CITY	Online	http://www.unpad.ac.id/2018/10/gubernur-jawa-barat-harapkan-peran-akademisi-wujudkan-smart-city/
49	25-Oct-18	Tempo.Co	Ridwan Kamil Minta Riset SMART CITY Bisa Diterapkan di Jawa Barat	Online	https://nasional.tempo.co/read/1139931/ridwan-kamil-minta-riset-smart-city-bisa-diterapkan-di-jawa-barat/full&view=ok
50	25-Oct-18	Pikiran Rakyat	Ridwan Kamil Minta Riset SMART CITY Bisa Diterapkan di Jawa Barat	Online	http://www.pikiran-rakyat.com/jawa-barat/2018/10/25/ridwan-kamil-minta-riset-smart%C2%A0city%C2%A0bisa-diterapkan-di-jawa-barat-432357
51	25-Oct-18	JabarProv	Ridwan Kamil Minta Riset SMART CITY Bisa Diterapkan di Jawa Barat	Online	http://humas.jabarprov.go.id/ridwan-kamil-minta-riset-smart-city-bisa-diterapkan-di-jawa-barat/1242

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52	27-Oct-18	Suara Merdeka	Ridwan Kamil Minta Akademisi Terapkan Hasil Riset SMART CITY di Jabar	Online	https://www.suaramerdeka.com/news/baca/139084/ridwan-kamil-minta-akademisi-terapkan-hasil-riset-smart-city-di-jabar
53	14-Nov-18	Tempo.Co	ITB dan MIT Gelar Riset Baterail Moda Listrik Generasi Ketiga	Online	https://tekno.tempo.co/amp/1146132/itb-dan-mit-gelar-riset-baterai-moda-listrik-generasi-ketiga
54	14-Nov-18	Sukabumi Update	ITB: Bahan Rahasia Baterai Kendaraan Listrik Ada di Indonesia	Online	https://sukabumiupdate.com/detail/ototekno/news/48203-ITB-Bahan-Rahasia-Baterai-Kendaraan-Listrik-Ada-di-Indonesia
55	15-Nov-18	Valid News	Eksploitasi Kubur Persistensi Ekspor Rajungan	Online	https://www.validnews.id/Eksploitasi-Kubur-Persistensi-Ekspor-Rajungan-zhY
56	15-Nov-18	Tempo.Co	Konsorsium ITB dan MIT akan Bikin Bus dan Motor Roda Tiga Listrik	Online	https://tekno.tempo.co/read/1146657/konsorsium-itb-dan-mit-akan-bikin-bus-dan-motor-roda-tiga-listrik
57	17-Nov-18	Tempo.Co	Ada AS di Balik Riset Kendaraan Listrik Nasional	Online	https://tekno.tempo.co/read/1147145/ada-as-di-balik-riset-kendaraan-listrik-nasional/full&view=ok
58	19-Nov-18	Jakarta Post	ITB and MIT Collaborate on Third Generation Electric Battery Research	Online	http://www.thejakartapost.com/life/2018/11/18/itb-mit-collaborate-on-third-generation-electric-battery-research.html
59	22-Nov-18	Mobilina News	ITB Bandung dan MIT Amerika Serikat adakan Riset Baterai Listrik untuk Otomotif	Online	http://www.mobilinanews.com/artikel/20083/ITB-Bandung-dan-MIT-Amerika-Serikat-adakan-Riset-Baterai-Listrik-untuk-Otomotif/
60	26-Nov-18	Indopos	Tiga Dosen Muda IPB Didaulat Sebagai Pimpinan ALMI	Online	https://indopos.co.id/read/2018/11/26/156673/tiga-dosen-muda-ipb-didaulat-sebagai-pimpinan-almi
61	1-Dec-18	Jakarta Post	National Health Day Tackling a Wicked Problem	Online	http://www.thejakartapost.com/academia/2018/12/01/national-health-day-tackling-a-wicked-problem.html
62	10-Feb-19	Berita Satu	Transjakarta Siapkan 5 Rute Baru Terintegrasi MRT Jakarta	Online	https://www.beritasatu.com/megapolitan/538900/transjakarta-siapkan-5-rute-baru-terintegrasi-mrt-jakarta
63	19-Mar-19	Harian Kompas	Jebakan Pembangunan Jangka Pendek	Newspaper	N/A

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64	19-Mar-19	Suara Merdeka	Kota Besar Perlu Konsep Hijau	Newspaper	N/A
65	19-Mar-19	Jawa Pos	Profesor Universitas Florida Terpikat Dengan Semarang	Newspaper	N/A
66	24-Mar-19	Bisnis Indonesia	BNBR Kerjasa Uji Coba Bus Listrik dengan Transjakarta	Online	https://market.bisnis.com/read/20190324/192/903730/bnbr-kerja-sama-uji-coba-bus-listrik-dengan-transjakarta
67	25-Mar-19	KBRI Washington DC	Kunjungan Prof.Dr. Bana Goerbana Kartasasmita, Guru Besar ITB yang pernah menjadi Lokal Staff di KBRI Washington DC	Online	http://education.embassyofindonesia.org/2019/03/kunjungan-prof-dr-bana-goerbana-kartasasmita-guru-besar-itb-yang-pernah-menjadi-lokal-staff-di-kbri-washington-dc/
68	25-Mar-19	SMART CITY	SMART CITY UI Director Prof. Heri Hermansyah Visited Waste-Impacted Kota Wetan, Garut	Online	https://smartcity.ui.ac.id/what-we-do/events/events-detail/smart-city-ui-director-prof-heri-hermansyah-visited-waste-impacted-kota-wetan-garut.html
69	28-Mar-19	Harian Kompas	Dari Diaspora Untuk Indonesia	Newspaper	N/A
70	1-Apr-19	Republika	Bus Listrik Transjakarta diklaim Tekan Biaya Operasional	Online	https://nasional.republika.co.id/berita/nasional/jabodetabek-nasional/ppa3mg366/bus-listrik-transjakarta-diklaim-tekan-biaya-operasional
71	1-Apr-19	Republika	Peneliti IPB: Kondisi Terumbu Karang Lombok Memprihatinkan	Online	https://nasional.republika.co.id/berita/nasional/jabodetabek-nasional/ppa3mg366/bus-listrik-transjakarta-diklaim-tekan-biaya-operasional
72	2-Apr-19	Kabar Faktual	Kunjungan ANBIOCORE ke Institut Biosains	Online	https://www.kabarfaktual.com/2018/08/02/peneliti-ipb-kondisi-terumbu-karang-lombok-memprihatinkan/
73	14-Apr-19	Biosains	Transjakarta Segera Uji Coba Penggunaan Bus Listrik di Jakarta	Online	http://biosains.ub.ac.id/kunjungan-anbiocore-animal-biotechnology-and-coral-reef-research-ke-institut-biosains/
74	15-Apr-19	Wartakota	Transjakarta Segera Uji Coba Penggunaan Bus Listrik di Jakarta	Online	https://wartakota.tribunnews.com/2019/04/15/transjakarta-segera-uji-coba-penggunaan-bus-listrik-di-jakarta
75	23-Apr-19	Radar Madura	Populasi Sapi Madura Harus Dijaga	Online	https://radarmadura.jawapos.com/read/2019/01/23/115395/populasi-sapi-madura-harus-dijaga

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76	26-Apr-19	JabarProv.go.id	Kunjungan Perwakilan USAID dan ANBIOCORE ke BPPIB Ciamis	Online	http://dkpp.jabarprov.go.id/kunjungan-perwakilan-usaid-dan-anbiocore-peneliti-ipb-dan-unpad-ke-bppib-tsp-ciamis/
77	1-Jun-19	Antara	Field Trip Training of Scientifc Communication and Proposal Writing ANBIOCORE USAID SHERA	Online	https://megapolitan.antaranews.com/berita/42311/peneliti-ipb-terumbu-karang-lombok-memprihatinkan
78	1-Jun-19	Antara	Peneliti IPB: Terumbu Karang Lombok Memprihatinkan	Online	https://megapolitan.antaranews.com/berita/42311/peneliti-ipb-terumbu-karang-lombok-memprihatinkan
79	1-Jun-19	Agronet	Peneliti IPB: Terumbu Karang Lombok Memprihatinkan	Online	http://www.agronet.co.id/index.php/detail/indeks/berita/2084-Terumbu-Karang-di-Perairan-Lombok-Kritis
80	1-Jun-19	Agronet	Terumbu Karang di Perairan Lombok Kritis	Online	http://www.agronet.co.id/index.php/detail/indeks/berita/2084-Terumbu-Karang-di-Perairan-Lombok-Kritis
81	2-Jun-19	BPTU-HPTIndrapuri	Field Trip Training of Scientifc Communication and Proposal Writing ANBIOCORE USAID SHERA	Online	http://bptu-hptindrapuri.com/site/index.php/headline/364-field-trip-trainnig-of-scientific-communication-and-proposal-writing-ambiocore-usaid-shera
82	30-Jun-19	DariLaut.id	IPB dan UNRAM Teliti Perairan Lombok dengan Metode E-DNA	Online	https://darilaut.id/tips-dan-trip/ide-inovasi/ipb-dan-unram-teliti-perairan-lombok-dengan-metode-e-dna
83	31-Jul-19	IIE	SHERA Program Director Reflects on IIE Summit 2019 and Bi-national Research Partnership Development	Online	https://www.iie.org/Learn/Blog/2019/07/SHERA-Program-Director-Reflects-on-IIE-Summit-2019-and-Bi-national-Research-Partnership-Development
84	5-Nov-19	Jawa Pos Radar Malang	Deteksi Gen lewat PCR Realtime di Fapet UB	Newspaper	N/A
85	19-Nov-19	Unud.ac.id	Universitas Udayana Bekerja Sama dengan ITB dan ASEAN NCAP Selenggarakan "The 6th ICEVT 2019"	Online	https://www.unud.ac.id/in/berita3184-Universitas-Udayana-Bekerja-Sama-dengan-ITB-dan-ASEAN-NCAP-Selenggarakan-The-6th-ICEVT-2019-.html
86	31-Dec-19	Kumparan	USAID-SHERA CCR Anbiocore Hadirkan Perempuan Tangguh Bidang Riset	Online	https://kumparan.com/news-release-ipb/usaid-shera-ccr-anbiocore-hadirkan-perempuan-tangguh-bidang-riset-1sYFMbqRVse
87	15-Jan-20	KBR Imaginacity	Mengimajinasikan Ibu Kota Baru yang Cerdas dan Berkelanjutan	Podcast	https://anchor.fm/imaginacity/episodes/Mengimajinasikan-Ibu-Kota-Baru-yang-Cerdas-dan-Berkelanjutan-ea6ifg

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88	10-Mar-20	Jatim Plus	Listrik dari Ganggang Mikro	Online	https://jatimplus.id/listrik-dari-ganggang-mikro/