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Task Order 15: Data for Education Programming in Asia and the Middle East (DEP/AME)

Review of USAID Higher Education Programs in Asia, 2011–2016

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Review of USAID Higher Education Programs in Asia, 2011–2016

Prepared for
Mitch Kirby
Senior Education Advisor, Asia Bureau
Contracting Officer's Technical Representative
Data for Education Programming/Asia and Middle East
1300 Pennsylvania Avenue NW
Washington, DC 20523

Prepared by
RTI International
3040 Cornwallis Road
Post Office Box 12194
Research Triangle Park, NC 27709-2194

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Abbreviations

ABET	Accreditation Board for Engineering and Technology
ADAPT-IT	Advancing Democracy & Promoting Transformations with Information Technology
ADEPT	Advancement and Development through Entrepreneurship Programs and Training
AIP	Agricultural Innovation Project
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
ASHA	American Schools and Hospitals Abroad
AUCA	American University of Central Asia
BSR	Business for Social Responsibility
BUILD IT	Building University-Industry Learning and Development through Innovation and Technology
CDCS	Country Development Cooperation Strategy
CHED	Commission of Higher Education Development
COMET	Connecting the Mekong through Education and Training
CSO	Community Service Organization
CVEB	Cross-Border Vocational Education
DAI	Development Alternatives International
EIG	Education for Income Generation
FtF	Feed the Future
GDA	Global Development Alliance
GDP	Gross Domestic Product
GE	General Electric
HEEAP	Higher Engineering Education Alliance Program
HELM	Higher Education Leadership and Management
HEPP	Higher Education and Productivity Project
HESN	Higher Education Solutions Network
HP	Hewlett-Packard
ICT	Information and communication technologies
IDEA	Innovative Development through Entrepreneurship Acceleration
IIE	Institute of International Education
IIT	Indian Institute of Technology
IL&FS	Infrastructure Leasing & Financial Services Ltd.
IMPACT MED	Improving Access, Curriculum and Teaching in Medical Education and Emerging Diseases
In-STEP	India Support for Teacher Education Program
IREX	International Research and Exchange Board
JBS	JBS International
LMPPI	Lower Mekong Public Policy Initiative
MYDev	Mindanao Youth for Development
NAS	National Academy of Sciences
NASA	National Aeronautics and Space Administration
PBED	Philippines Business for Education
PCARI	Philippine-California Advanced Research Institutes
PEER	Partnerships for Enhanced Engagement in Research
PICTT	Promotion of Information and Communication Technologies in Turkmenistan
PM-TMEM	Professional Masters in Tropical Marine Ecosystems Management

PRESTASI-II	Program to Extend Scholarships and Training to Achieve Sustainable Impacts
R&D	Research and Development
RDMA	Regional Development Mission for Asia
ROI	Return on Investment
RTI	RTI International
SCC	Southern Christian College
SHERA	Sustainable Higher Education Research Alliances
SLP	Student Loan Program
SME	Small and Medium Enterprises
STEM	Science, Technology, Engineering, and Math
STEM-AT	Science, Technology, Engineering, Math, Accounting, and Tourism
STRIDE	Science, Technology, Research and Innovation for Development
SWEEP	Social Work Education Enhancement Program
UP	University Partnership
UPLOAD Jobs	University Partnership Linking Out-of-School Youth to Agri-entrepreneurship Development to Promote Job Opportunities for Business Scale-Up
USAID	US Agency for International Development
USG	US Government
VNAH	Vietnam Assistance for the Handicapped
VULII	Vocational and University Leadership and Innovation Institute

Executive Summary

Higher education development programs are subject to shifting priorities within aid agencies, such as new sector strategies, aid implementation reforms, and changes in foreign policy direction. For higher education programs funded by the US Agency for International Development (USAID) in the latter half of the Obama Administration (2011–2016), this shift meant a new education strategy and USAID Forward reforms that sought new partnerships, enhanced focus on science and technology, and challenged programs to reach greater scale and better sustainability. For the Asia region—the geographic focus of this study—this time period also witnessed a foreign policy "pivot" to Asia, with the US Government (USG) seeking increased economic ties, improved institutional linkages, greater people-to-people exchanges, and deeper engagement of regional multilateral organizations in the Asia region.

This study inventories selected higher education investments made by USAID in the Asia region during this period to catalog program diversity and assess how and to what extent the programs reflect these broad trends.[1] In all, the research team considered 34 programs across 13 countries. The programs reviewed were mostly small ($1 million to $3 million in funding on average), involved US higher education institutions as partners (70%), and were concentrated at upper tertiary level bachelors and graduate programs, and advanced research (85%).

All of the programs reviewed showed programmatic design and implementation characteristics consistent with the broad trends assessed, though some criteria considered were less prevalent, especially the Asia Pivot parameters. Given increasing evidence that higher education is one of the most important education investments a country or an individual can make, it is prudent for USAID to learn from these diverse programs and determine promising approaches. Unfortunately, only eight of the 34 programs reviewed had been evaluated previously, making learning from these programs more difficult.

1. Introduction

This study was conducted at the request of USAID's Asia Bureau to understand the scope of higher education investments in Asia during the 2011–2016 time period and to assess programmatic reflection of key development and foreign policy directions of the time. The review was conducted using secondary analysis of publicly available program documents, such as fact sheets, program websites, press releases, program reports, and sometimes evaluations. Given the lack of evaluations and primary data, this study is not an evaluation of program effectiveness or impact but rather a more surface-level review of program characteristics and parameters.

This paper first discusses the importance of higher education to development and the particular approach USAID takes to its higher education investments. It then discusses Obama

[1] We attempted to find all programs that fit into a broadly defined category of higher education. This category includes all programs aimed at skills training for employment (i.e., workforce development), programs targeting university development, and programs that support and leverage universities and professors or students in pursuit of other sectoral development objectives.

Administration foreign policy and development assistance initiatives in Asia before presenting findings of program review. Findings are presented in an inventory of programs, key characteristics across programs, and short case study discussions of programs highly aligned with certain review criteria.

2. Background

2.1 The Importance of Higher Education

Higher education is a classic dual-function institution, providing a mix of public and private returns. Public investment in higher education is made with the expectation that higher education will result in better human and social capital reserves; research and development (R&D) for innovation-led economic growth and social progress; and support for critical community extension services. Privately, individuals invest in higher education with expectations of skill acquisition, improved labor market signaling, and commensurate employment and wage dividends.

Recent research suggests that both investment rationales are merited. The World Bank finds that higher education enhances the ability of a nation's citizens to make informed decisions; produce, adopt, and adapt technology; develop livelihoods; cope with shocks; be healthier; engage civically; and be more effective stewards of natural resources.[2] At a macro level, Harvard economist Robert Barro has shown that higher education is a key determinant of economic growth, with an additional year of individual attainment of secondary or higher education raising national output by 19% and Gross Domestic Product (GDP) by a half a percent.[3] Research released this year by the London School of Economics researchers finds that countries that doubled their number of universities over the past 50 years experienced a 4% GDP growth premium on average, holding other variables constant. McMahon has looked at job creation, good governance, increased entrepreneurship, and increased intergenerational mobility to claim that societal benefits to higher education are much higher than traditional estimates.[4]

For individuals, new research released by the World Bank in 2014 was deemed a "stunning reversal" of decades' long belief that primary education provides the highest individual rate of return, with new data showing that tertiary education provides 14.6% returns versus primary's 10% returns.[5] The returns to tertiary education in South Asia (17.3%) and East Asia (14.8%) were both above global averages. The paper, based on data from 139 countries and from more than 50 years, also indicates that the returns to education are highest for women. It should be noted that several economists reject the simple "educational attainment" measurement and

[2] World Bank. (2007). Building knowledge economies: Advanced strategies for development. Washington, DC: World Bank.
[3] Barro, R. (2002). Education as a Determinant of Economic Growth. In E.P. Lazear, ed., *Education in the Twenty-First Century*. Hoover Institution Press.
[4] McMahon, W.W. (2009). Higher learning, greater good: The private and social benefits of higher education. Baltimore: Johns Hopkins University Press.
[5] Montenegro, C.E. & Patrinos, H.A. (2014). Comparable estimates to returns to schooling around the world. Washington, DC: The World Bank Group

instead argue that the quality of education, measured by individual cognitive skill gains and school quality metrics, is more important for estimating returns.[6]

2.2 Higher Education and USAID Development Objectives

USAID investments in higher education development abroad serve several strategic purposes, moving beyond mere economic rates of return calculus. USAID has traditionally approached post-secondary education investment as a place to advance education and economic growth objectives, as well as a vehicle for agriculture, health, and governance progress. Higher education programs also represent an opportunity for USAID to contribute to diplomatic goals of people-to-people exchanges and institutional linkages. Further, USAID investments in higher education serve strategic commercial and trade and export purposes, as sponsored students pay tuition in the United States and US universities establish footprints in markets abroad through development programs. US companies can also benefit from access to skilled workers and improved supply chains. All told, these investments, which total roughly $400 million a year, are of high importance to USAID.[7]

Like all USG development programs, USAID higher education investments are affected by ever-changing aid-delivery approaches and mandates, such as the current USAID Forward emphasis on building local capacity, partnering with the private sector, pursuing breakthrough innovation, and scaling and sustaining what is working based on rigorous evidence. USAID higher education investments also have an ever-watching and politically powerful constituency; US colleges and universities are eager to implement development programs and expand their global activities. These factors may shape how, when, why, and where USAID invests in higher education development.

2.3 The Obama Administration

International development assistance was affected by three significant factors under the Obama Administration, all of which took several years to promulgate and begin implementation, though each were well established by 2011: (i) new approaches to USAID sector and country development strategies, (ii) USAID Forward implementation reforms, and (iii) the US foreign policy "Asia Pivot." Each of these areas map to the Presidential Policy Directive on Global Development (PPD 6), which called for more focused policy and strategy development, new operational models, and whole of government approaches in support of common objectives.

New Strategy Development: Strategy development at USAID has always been a dynamic balance between the need for global strategies to communicate global objectives and the general supremacy of country-level considerations under the USAID decentralized mission structure. Approaches to both of these strategy levels, and the interplay between them, changed significantly under the Obama Administration, strengthening both and increasing global-local strategic tensions.

[6] Hanushek, E. & Wosmann, L. (2012). Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. *Journal of Economic Growth* 17:267-321.

[7] An internal review by USAID in 2012 determined that the agency spends roughly $400 million per year on programs in the broadly defined higher education space. This number is now dated and should be treated as a rough parameter, not an exact estimate.

For sector strategies, USAID's Bureau of Policy, Planning, and Learning insists that each new policy make hard choices, set ambitious targets, and provide adequate resources for measurement of progress against goals. These are not to be the strategies of old that allowed for a broad range of projects under a loose rubric, such as "promoting access to quality education," in the case of previous education strategies. Such strategies complicated the roll up of global efforts and challenged USAID as it sought to hire and train education staff and engage partners. Instead, the new strategies must specifically outline what is left out, hone in on a small number of strategic priorities, limit the number of countries involved, and set public targets that require country-by-country effort to achieve.

In the case of education, which was the first sector to go through the new process, this change resulted in the groundbreaking 2011–2015 Education Strategy. The strategy left out important education activities—namely early childhood education—and set clear goals in three areas: early grade reading, workforce development and tertiary education, and access to education in conflict and crisis environments. In the prologue to the strategy, then USAID Administrator Rajiv Shah wrote:

> This strategy ushers in a new era of evidence-based strategic guidance that will lead to more focused and collaborative education investments aimed at improving learning outcomes and institutional sustainability in our partner countries. It is an example of USAID's commitment to use development resources selectively, efficiently, and with greater accountability and impact.[8]

This second goal of the strategy—Improved ability of tertiary and workforce development programs to generate workforce skills relevant to a country's development goals—represents a subtle shift toward "workforce skills" but was less clear than the other two goals as to exact targets and implementation parameters. The goal allows for a range of workforce and tertiary investments (quality of training, access to training, promotion of R&D activities) and does not specify an institutional home for such efforts, allowing for work in vocational schools, universities, and nonformal programs with nonprofits or certificate providers. To align with this goal, USAID programs in this area needed only to show that their program promoted skills development or R&D aligned to country priorities, a low mark to meet for most investments. As a result, assessing programmatic alignment with Goal 2 of the USAID Education is a facile task, as most programs are broadly in line.

At the same time, country-level strategy development was also receiving an overhaul at USAID with the introduction of Country Development Cooperation Strategies (CDCS). The new CDCS process was meant to incorporate USG development priorities (Presidential Initiatives, USG policies and strategies, and USAID global strategies) with partner country priorities. Like global strategies, the new CDCS structure asked missions to make tough choices and reduce investment areas to two or three main development objectives. Unlike global strategies, however, CDCS designers had to also account for alignment with partner country development plans, expectations, and political pressures. This requirement often meant that CDCS language was left more open and allowed for more latitude than did global strategies, though the two were theoretically perfectly nested. In the case of higher education, this situation resulted in little tension, as Goal 2 of the USAID Education Strategy was broad as well.

[8] US Agency for International Development (USAID). (2011). USAID education strategy. USAID: Washington, DC.

USAID Forward: At an operational level, the Obama Administration was hard at work on significant changes to how US development assistance would be implemented. Called USAID Forward, the reform package has dominated the 2011–2016 period with a slate of new rules, regulations, initiatives, mandates, and expectations, especially for field missions. Specifically, USAID Forward reforms focus on three main areas:

- *Deliver results through strengthened capacity:* In this area, USAID seeks to "deliver results on a meaningful scale through a strengthened USAID." To achieve this goal meant new approaches to strategy development; a new evaluation policy; new staff hiring, training, and mentoring programs; and building local capacity to deliver USAID assistance.
- *Partner for sustainable development:* Under USAID Forward, USAID sought to drive sustainability of its investments through "high-impact partnerships and local solutions." To do so, USAID promulgated new regulations, set ambitious targets, and provided new resources to missions so that they might engage new partners—local organizations, host governments, the private sector, and innovative financiers.
- *Unlock game-changing solutions:* USAID Forward makes "identifying and scaling up innovative, breakthrough solutions to intractable development challenges" a high priority. With implications for higher education investments, USAID Forward seeks to rekindle historic relationships with scientists, researchers and universities and invest in new technologies. As a part of this pillar, USAID launched a Global Development Lab and funded programs such as the Higher Education Solutions Network (HESN), a $125 million program that seeks to catalyze innovation through investing in a network of university based R&D labs.[9]

USAID Forward has had real implications for sector- and country-level strategies and has mandated that these strategies be achieved *through* new means, such as significant engagement of local organizations, more and better private sector partnerships, and an emphasis on scale and sustainability. It has also meant that these strategy levels must be tightly aligned and well measured through rigorous evaluation.

Asia Pivot: The Obama Administration has pursued what it calls a "whole of government" approach to its national security and foreign affairs efforts. For the US Department of State and USAID, this approach has manifested in the Quadrennial Diplomacy and Development Reviews. These reviews have occurred in 2011 and 2015, marking a renewed effort at aligning development assistance with broader USG interests and objectives. This approach has resulted in joint US Department of State and USAID country-level development strategies and more interagency coordination within broad initiatives, such as food security, climate change, and global health issues. On a regional basis, there have been special whole of government initiatives, such as fighting crime and violence, reducing migration pressures in Latin America, and promoting democratic transition and fighting terrorism in the Middle East. For Asia, the whole of government effort has been focused on "pivoting" toward (i.e., investing more in) a region thought to define our economic future.

[9] https://www.usaid.gov/usaidforward

The Asia Pivot was first articulated by then Secretary of State Hillary Clinton in a 2011 article Foreign Policy titled, "America's Pacific Century."[10] That piece lays out six main tenants of the pivot, a term used throughout the article:

- Strengthening bilateral alliances
- Deepening working relationships with emerging powers
- Engaging with regional multilateral institutions
- Expanding trade and investment
- Forging a broad-based military presence
- Advancing democracy and human rights

For USAID, this pivot has meant increased attention and new approaches to bilateral assistance programs with emerging powers (Indonesia, Vietnam, and India) and new programs with emerging democracies (Burma). During this time, USAID has also increased its support for regional integration (e.g., Lower Mekong Initiative, Young South East Asian Leaders Program) and regional trade agreements (e.g., Trans Pacific Partnership), and has expanded support for regional multilaterals, particularly the Association of Southeast Asian Nations (ASEAN). USAID has supported the market expansion of US companies and promoted exports by Asian companies to the US market. In addition, USAID has expanded support for democracy and human rights as well as addressed the cross-border challenges of climate change, pandemic diseases, and human trafficking. Perhaps most significant, several USAID missions in the region have implemented new institutional linkages, people-to-people exchanges, and education partnerships (e.g., India, Indonesia, Vietnam).

3. Research Description

This research was commissioned by the USAID Washington Asia Bureau to determine the range of USAID higher education programs in Asia during 2011–2016 and how and whether these programs reflect changes in the USAID Education Strategy, USAID Forward, and Asia Pivot outlined in the previous section. More broadly, the research seeks to identify promising practices within those parameters that can guide the design of future programs in the region. To do so, the research team answered a set of research questions by reviewing as many as possible USAID Higher Education programs in the Asia Region that were in place between 2011 and 2016.

3.1 Research Questions

The research team, in coordination with USAID, posed the following questions at the onset of the study:

Question 1: What higher education programs did USAID fund in Asia during the period 2011–2016? What general characteristics do they share?

Question 2: How do these programs reflect the major development and foreign policy trends of the second term of the Obama Administration?

[10] Clinton, H. (November 2011). America's Pacific Century. *Foreign Policy*.

Question 3: What outcomes did programs highly reflective of certain trends achieve? What elements are recommended for future programming?

3.2 Methods

It is important to note at the onset that this study is not an evaluation. Primary data collection and travel to the region were beyond the scope and budget of the study. Rather, the study relied on review of secondary data, most of it publicly available, to construct an inventory of programs and review programs against a set of criteria. The research team did not evaluate program performance, per se, though the short case studies presented in section 4.3 comment on outcomes and impacts of various programs, when possible.

Inventory Construction: To build the inventory of USAID higher education programs in Asia 2011–2016, the research team went country by country for each of the countries covered by the Asia Bureau, and considered higher education programs funded by the Regional Development Mission for Asia (RDMA) and Washington Bureau. Where possible, the research team sought to include programs that were initiated in 2011 or after, but also considered several programs that had started earlier and extended into this time period. For each program, the team collected and presented basic information on the program's name, funding level, implementing partners, period of performance, and scope parameters.

Assessment Criteria: To determine the extent to which the 34 programs reviewed reflect development and foreign policy trends of the era, the research team developed 10 review criteria (see ***Table 1***). These criteria correspond to each of the major strategy and policy thrusts under consideration: The new USAID Education Strategy 2011–2015, the USAID Forward reforms, and the whole of government Asia Pivot.

Table 1: Review Criteria

Category	Element	Review Criteria
Education Strategy	Goal 2	Degree to which the program focuses on workforce skills development in support of country development strategy
USAID Forward	Delivering results at a meaningful scale	Degree to which the program takes clear, strategic approach to achieving impact at a meaningful scale
USAID Forward	Delivering sustainable results	Degree to which the program takes a clear, strategic approach to achieving meaningful sustainability
USAID Forward	Partnering for sustainable development	Degree to which the program directs significant resources to local partners
USAID Forward	Partnering for sustainable development	Degree to which the program significantly engages the private sector
USAID Forward	Unlocking game-changing solutions	Degree to which the program focuses on science and technology for development
USAID Forward	Unlocking game-changing solutions	Degree to which the program focuses on innovation, especially mobile solutions

Category	Element	Review Criteria
Asia Pivot	Deepening working relationships with emerging powers	Degree to which the program promotes people-to-people exchanges or institutional linkages between the United States and partner country
Asia Pivot	Engaging regional organizations	Degree to which the program represents significant engagement of ASEAN and other Asia-based multilateral organizations
Asia Pivot	Expanding trade and investment	Degree to which the program might support US higher education or commercial market gains in Asia

For the actual program review, four researchers reviewed programs, giving each program a rating of high, medium, or low for each of the review criteria. The reviewers were looking for "evidence of" certain aspects, such as "evidence of private sector engagement." If the evidence was significant, with private sector partners contributing financially to the program or heavily involved in its implementation, the reviewers rated this criterion as "high." If the private sector is not mentioned in any available program documents, the reviewers rated private sector engagement as low. To provide consistency across assessors, a lead assessor reviewed each assessment and normed the results across programs. Please note: this review was of publicly available documents, in some cases just a fact sheet, a website, or one or more annual program reports. The review is not meant to evaluate the programs or pass judgment on their designs, but more simply assess the extent to which the programs seem to reflect development assistance and foreign policy trends of the time. The research team did not expect any one program to be "high" across criteria, as programs do and must make necessary choices given scarce resources and certain programmatic realities.

Case Study Selection: Based on this review of the programs, the team selected one program per review criterion to illustrate particularly strong reflection or demonstration of that criterion. For these short case studies, the research team sought evidence on performance and attempted to understand impact.

4. Findings

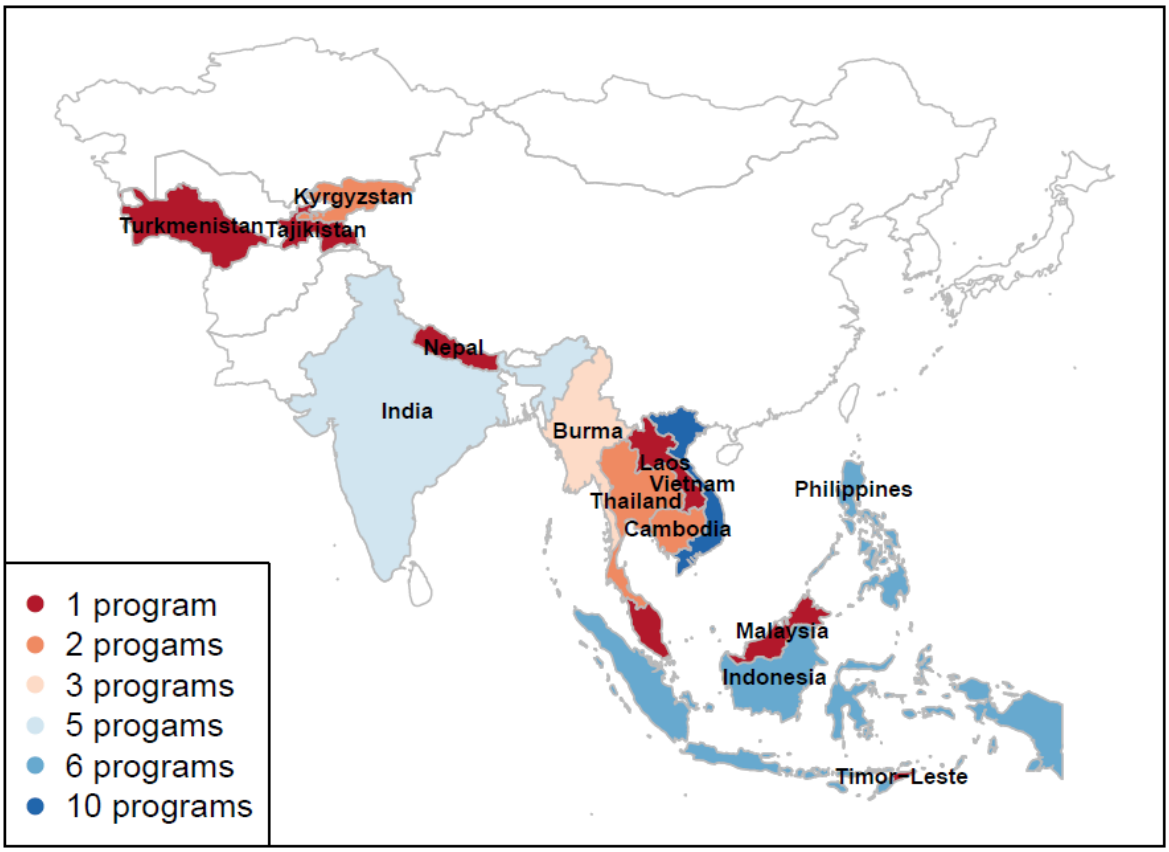
4.1 Inventory of Asia Higher Education Programs 2011–2016

Research Question 1: What higher education programs did USAID fund in Asia during the period 2011–2016? What general characteristics do they share?

The review of publically available sources yielded the 34 programs inventoried in ***Table 2***. In looking at these programs as a whole, the following general characteristics emerge:

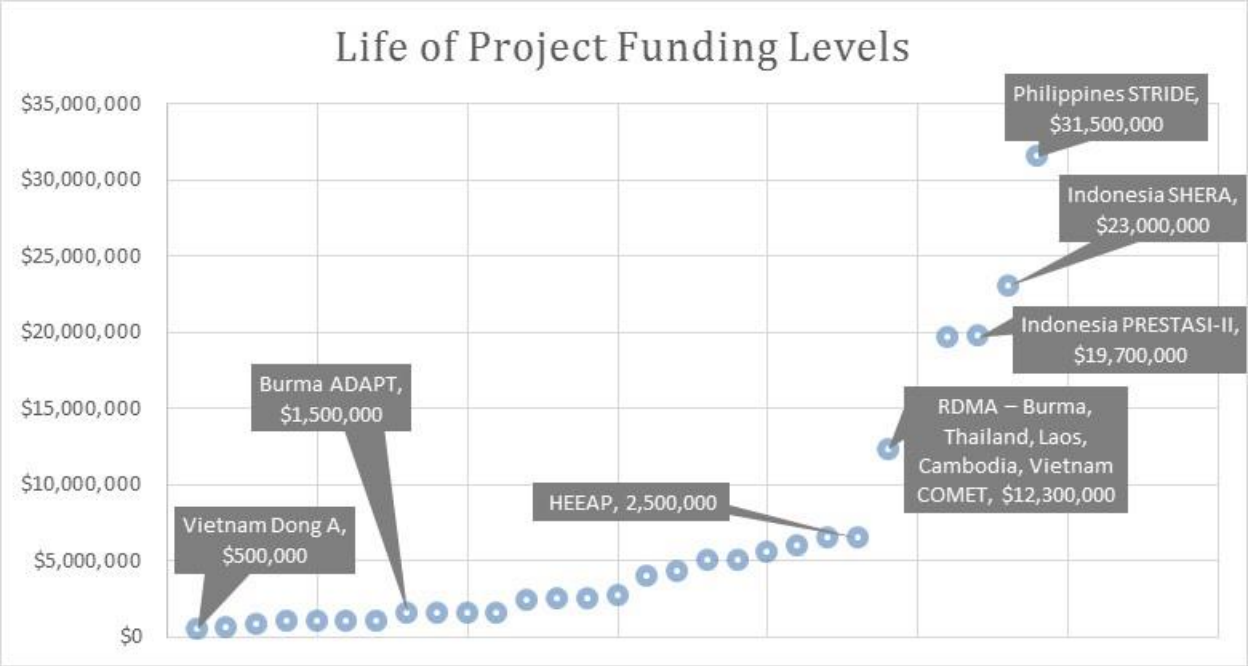
- Thirteen of the 21 USAID country programs in Asia (62%) supported higher education investments during this period (see ***Figure 1***). Most of these programs were bilateral, save the Connecting the Mekong through Education and Training (COMET) program run by RDMA, which operates in Burma, Thailand, Cambodia, Laos, and Vietnam; and the One-Health Network, also managed by RDMA, which connect and advance health science programs in Thailand, Malaysia, Cambodia, Vietnam, and Indonesia to provide the skilled workers needed to combat emerging pandemic diseases.

Figure 1: Number of USAID-Funded Higher Education Programs by Country in Asia



- Some countries have **extensive higher education portfolios** when measured by number of programs: Vietnam (10), Philippines (6), India (5), and Indonesia (5).
- The vast majority of programs (85%) **targeted the upper levels of tertiary** education, predominately four-year universities. The notable exceptions are several nonformal education programs (Nepal, Philippines) for out-of-school learners and a handful of technical education-focused programs (RDMA, Tajikistan, India).
- **US universities play a substantial role** in program administration, with 24 out of the 34 (70%) programs involving US higher education institutions in various parts of the program.
- **Program funding levels are modest**, with 70% of the programs clustered under $5 million and only five programs funded at greater than $15 million, in a time period that consistently saw programs in other sectors in the $25 million to $50 million range. ***Figure 2*** highlights funding distribution and example programs.

Figure 2: Funding Levels for USAID Higher Education Programs in Asia, 2011–2016



- Not surprisingly, given Asia's rich private sector and high economic growth, these programs **leveraged a significant amount of private sector funding**, with ten of the programs (one-third) defined as USAID Global Development Alliances (GDAs).
- The inventoried programs **range in sectoral focus and program modalities**.
  Sectoral focus: agriculture; basic education, teacher training; biodiversity, marine ecosystems; economics, entrepreneurship; energy; environment, climate change; health care, public health; information communications technology; livelihoods, youth development; public policy; science and technology, particularly engineering; social work; tourism, hospitality; water, sanitation; wildlife trafficking

  Program modalities: student exchange, scholarships, loans; faculty training, professional development; curriculum and program development; research system development; leadership training, governance, administration reform; technology advancement, distance learning; extension services; nonformal education, life skills
- **Very few of the programs had been evaluated**, with only eight of the 34 programs (24%) receiving external, third-party evaluations. To some extent, this lack of evaluation might be the result of the small program sizes and that programs in this time frame were not yet completed.

Table 2 presents the inventory of reviewed programs.

Table 2: Inventory of USAID Higher Education Programs in Asia, 2011–2016

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
Burma	Advancement and Development through Entrepreneurship Programs and Training (ADEPT)	2013–2016	Indiana University GDA: VinaCapital, Hewlett-Packard (HP), Business for Social Responsibility (BSR)	$1M	ADEPT is improving the teaching and outreach capacity of the Yangon Institute of Economics and assisting in the development of small and medium enterprises (SMEs) through information and communication technology-led programs—chiefly HP Life e-learning platform and business centers. With capital from VinaCapital, the program enables credit access. BSR is supporting SMEs by launching an educational working group series on environmental, labor, human rights, and other issues critical to multinational investors.
Burma	Advancing Democracy & Promoting Transformations with Information Technology (ADAPT-IT)	2013–2015	University of Washington GDA: Microsoft	$1.5M	ADAPT-IT developed higher education curricula, training, and outreach programs to build knowledge, skills, and information competencies among Burma's next generation of leaders. The program created information hubs based in libraries, institutions of higher education, civil society organizations, and other public and private sector institutions to reach underserved areas.
India	Generation	2015–2019	McKinsey Social Initiative GDA: Nine Indian health care and hospitality companies and McKinsey & Co	$5M	Generation is a short-term, skills training program that helps Indian training institutions partner with private sector employers to define skill need and determine hiring demand, and then train young people in soft and technical skills for waiting jobs.
India	India Support for Teacher Education Program (In-STEP)	2013–2014	Arizona State University Cooperative agreement	$4.3M	In-STEP provided training and small project assistance for 110 Indian teacher educators and policy support for Indian Ministry of Human Resource Development to improve basic education in India.

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
India	Partnerships for Enhanced Engagement in Research (PEER)	2012–2016	National Academy of Sciences (NAS), Indian universities GDA: General Electric (GE)	Small grants	USAID is partnering with GE in India to offer research partnership opportunities for researchers in India. Research collaborations are geared at accelerating the use of science and technology to generate context-relevant solutions to critical development challenges in India. Indian researchers partner with GE scientists based at the John F. Welch Technology Center in Bangalore on research projects in the following focus areas: water purification and treatment; renewable energy; and urban sanitation.
India	Indian Institute of Technology (IIT) Peer Partnership Support	2015–2016	RTI International, Duke University Contract	$625K	The IIT support program is strengthening faculty development approaches, the research enterprise, and external relations strategies for one of India's newest IITs—IIT Gandhinagar. A program add-on includes support for the development of a Technology Park at the IIT, leveraging a large investment by the government of India. Duke and are RTI are considering becoming the Technology Park's first tenants post-USAID funding, among the continuation of other partnership activities.
India	Agricultural Innovation Project (AIP)	2011–2014	Sathguru Management Consultants and six US universities led by Cornell University Cooperative agreement	$5.5M	AIP assisted three Indian universities in adopting new curriculum and extension management training programs. AIP also launched research initiatives to better prepare a market-ready workforce and promote new innovative technologies in agriculture. USAID collaborated with the World Bank to extend the program to 71 other Indian universities, as well as influence programs in Nepal and Malawi.
Indonesia	Program to Extend Scholarships and Training to Achieve Sustainable Impacts (PRESTASI-II)	2012–2017	Institute of International Education (IIE) and dozens of US host universities Cooperative agreement	$19.7M	PRESTASI-II provides opportunities for more than 100 Indonesians to earn master's degrees in selected fields, primarily from universities in the US. The program seeks to improve the performance and leadership skills of Indonesian emerging professional leaders.

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
Indonesia	Higher Education Leadership and Management (HELM)	2011–2016	Chemonics, Indiana University, University of Kentucky, JBS International Contract	$19.6M	HELM is increasing higher education's quality and relevance through higher education management improvement. The project focuses on four core management areas: general administration and leadership, financial management, quality assurance, and collaboration with external stakeholders. Through various trainings and workshops, special initiatives, and collaborative research efforts, HELM is supporting 50 Indonesian higher education institutions.
Indonesia	University Partnership (UP)	2009–2014	Various US and Indonesian universities Cooperative agreements	Each ~ $600K to $1M	The UP program consisted of a portfolio of partnerships between US and Indonesian universities to improve teaching and research in Indonesia. US partner universities built technical capacity in Indonesian universities in public health, education, environmental protection, and climate change. USAID awarded a total of 16 grants under the UP program.
Indonesia	Partnerships for Enhanced Engagement in Research (PEER)	2012–2016	NAS, Indonesia academics	Small grants	PEER Indonesia supports collaborating research projects between US and Indonesian researchers in the priority areas of climate change, education, and wildlife trafficking. The US-based researcher must have secured funding from a US-based researcher funder. USAID then provides funding support for the Indonesian research collaborator.
Indonesia	Sustainable Higher Education Research Alliances (SHERA)	2016–2021	IIE, US and Indonesia university grantees Cooperative agreement	$23M	SHERA will establish Centers for Collaborative Research and strengthen research capacity of Indonesian higher education institutions by providing support to faculty, staff, PhD students, and post-doctoral researchers. To do so, SHERA will award two-year to four-year grants to develop university partnerships between select US and Indonesian universities. The partnerships will bring together scholars to conduct world-class research in science and technology.

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
Kyrgyzstan	American University of Central Asia (AUCA) Moving Forward	2010–2015	AUCA Cooperative agreement	$2.7M	The AUCA Moving Forward program aimed to improve faculty development, recruitment diversity, career services, and technology usage, and provided scholarships for students. It also established a joint degree program between AUCA and Bard College in the United States and developed new curricula in environmental protection.
Kyrgyzstan	Student Loan Program (SLP)	2009–2012	Kyrgyz Investment and Credit Bank	Small loans	SLP increased access to education for prospective students and access to qualified graduates for prospective employers by providing loan guarantees to two local banks. The banks made loans to students for university and vocational schools tuition. USAID protected loan risk by covering potential losses. The program created first-ever loans for students to attend higher education.
Nepal	Education for Income Generation (EIG)	2008–2012	Winrock International Contract	$14.7M	The EIG program combined nonformal literacy and life skills education with nonformal vocational training linked to employment or business development. For some participants, the program provided training to increase agricultural productivity.
Philippines	Higher Education and Productivity Project (HEPP)	2012–2013	Philippines Business for Education (PBED) Cooperative agreement	$1.5M	At the national level, HEPP initiated policy reforms and wider industry academe partnerships. At the regional level, HEPP sought to improve the availability of information on industry and higher education capability. At the local level, it developed manpower plans and concrete industry-academe partnerships.
Philippines	Innovative Development through Entrepreneurship Acceleration (IDEA)	2013–2016	GDA: PhilDev	$1.5M	IDEA scales up PhilDev's entrepreneurship programs, which train Filipino engineers and scientists in business development. IDEA holds entrepreneurship symposia, conducts entrepreneurship workshops for Filipino engineering scholars, and organizes a Visiting Professor Program to evaluate engineering and science programs and infuse entrepreneurship in Filipino curriculums.

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
Philippines	Science, Technology, Research and Innovation for Development (STRIDE)	2014–2019	RTI, Rutgers, Florida State University, University of Michigan, PBED Cooperative agreement	$31.5M	The STRIDE program is improving the qualifications of faculty and staff in higher education institutions engaged in science, technology, engineering, and math (STEM) disciplines; improving STEM research capacity; strengthening linkages between universities and industry through collaborative grants and R&D tech transfer programs; and strengthening policy and management capacity of higher education institutions in improving the STI ecosystem.
Philippines	University Partnership Linking Out-of-School Youth to Agri-entrepreneurship Development to Promote Job Opportunities for Business Scale-Up (UPLOAD Jobs)	2012–2015	Higher Education for Development, University of Hawaii, Southern Christian College (SCC) Cooperative agreement	$1M	UPLOAD Jobs sought to improve rural workforce development through improving SCC's extension programs in agricultural entrepreneurship. Further, it sought to improve the livelihoods and increase incomes for rural out-of-school youth by providing training in workforce development through university extension services.
Philippines	Mindanao Youth for Development (MYDev)	2013–2018	Education Development Center Cooperative agreement	$1.5M	MYDev establishes Youth Development Alliances made up of local governments, academia, the private sector, and national government agencies to address youth issues. Youth are provided life skills training, technical skills training, and community service opportunities through program alliances.
Philippines	Professional Masters in Tropical Marine Ecosystems Management (PM-TMEM)	2011–2015	University of the Philippines	Missing	The PM-TMEM project developed a post-graduate academic program on tropical marine ecosystems management at the University of the Philippines.
RDMA – Burma, Thailand, Laos, Cambodia, Vietnam	COMET	2014–2019	Education Development Center Contract	$12.3M	COMET is working to close the gap between the private sector, universities, and vocational schools to build the supply of skilled workers demanded by businesses. The project uses available technology, online learning, and traditional in-person workshops to promote learning and regional networking. Partners include educational institutions, private sector companies, host governments, and ASEAN.

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
RDMA: Thailand, Malaysia, Cambodia Vietnam, Indonesia	One-Health Workforce	2009–2014	Tufts, University of Minnesota, Development Alternatives International Cooperative agreement	$50M	The program established the One-Health University network. The network developed One-Health Core Competencies from which to base curricula. One-Health then developed modular courses, student field experiences, and faculty exchange programs. New graduate and undergraduate programs were piloted to create the health professionals needed to address infectious disease threats. In addition, in-service training programs were developed to create One-Health leaders in the existing workforce.
Tajikistan	Cross-Border Vocational Education (CVEB)	2009–2015	University of Central Asia, Aga Khan Foundation Cooperative agreement	$1M	The CVEB program fostered cross-border cooperation and job creation between Afghanistan and Tajikistan. The project supported training that responded to local labor market needs. Training modules were short-cycle professional and vocational training implemented by the University of Central Asia.
Turkmenistan	Promotion of Information and Communication Technologies in Turkmenistan (PICTT)	2009–2014	Counterpart International, IREX Cooperative agreement	$1M	PICTT provided higher education institutions, teachers, researchers, administrators, and students with technology and tools to enhance classroom learning and develop participatory methodologies for teaching through the integration of information and communication technologies (ICT) into education. Other project activities included distance education and sharing best practices on a listserv and e-platform hosted by the Turkmenistan Academy of Sciences.
Timor-Leste	Hillary Clinton Scholarship Program	2012–2017	IIE Contract	$6.5M	The Timor-Leste Hillary Clinton Scholarship Program is a USAID-sponsored scholarship program that aims to strengthen the base of skilled, high-performing professionals in Timor-Leste to contribute to the country's economic and social development. The program includes opportunities in education and training with the expectation that the scholar returns home better equipped with formal qualifications as managers, civic and government leaders, subject matter specialists, and entrepreneurs.

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
Vietnam	Higher Engineering Education Alliance Program (HEEAP)	2010–2014	Arizona State University, Portland State University, Intel, Siemens GDA: Intel, Siemens, Cadence, Danaher, Pearson, National Instruments	$2.5M	Through six-week faculty workshops at Arizona State University, industry-sponsored reform projects, and in-country training, HEEAP is enhancing traditional theory-based engineering and technical vocational programs. HEEAP advocates for applied, hands-on instructional approaches through training of university and department leadership. This modern pedagogy aims to produce work-ready graduates who possess the skills required to excel in multinational corporations. HEEAP continues to be funded by the government of Vietnam and by private sector partners post-USAID funding.
Vietnam	Vocational and University Leadership and Innovation Institute (VULII)	2012–2015	Arizona State University, Portland State GDA: Intel, Siemens, Cadence, Danaher, Pearson, National Instruments	$2.4M	As an extension of HEEAP, VULII promoted systemic change across institutional administrations using an integrated approach involving academic leadership from rectors to academic program leaders and senior faculty. VULII provided capacity building and training using models of leadership and quality assurance.
Vietnam	Social Work Education Enhancement Program (SWEEP)	2012–2015	San Jose State University GDA: Cisco Systems	$2.5M	SWEEP collaborated with universities in Vietnam to strengthen social work education and prepare job-ready social workers. It developed systems to strengthen social work education management and administration, devised processes to enhance faculty development opportunities, and developed relevant social work curriculum. Cisco provided remote connectivity to network the institutions involved.
Vietnam	Building University-Industry Learning and Development Through Innovation and Technology (BUILD IT)	2015–2020	Arizona State University, Portland State University, Catholic University GDA: Autodesk, Siemens, Tektronix, Pearson, National Instrument, Microsoft, Mobifone, Viettel, eSilicon, Intel, Oracle, Everest Education	$6M	BUILD IT leverages government, industry, and academic partners in the United States and Vietnam to link STEM instruction in Vietnamese universities with the needs and capabilities of industry partners. The program aims to produce graduates who can lead inclusive, technology-based growth by engaging leadership in strengthening higher education policy; enabling university-private sector collaboration; and developing curriculum partnerships, mentorships, and industry-sponsored opportunities to build students' competencies in preparation for STEM careers.

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
Vietnam	Improving Access, Curriculum and Teaching in Medical Education and Emerging Diseases (IMPACT MED) Alliance	2016–2021	Brigham & Women's Hospital, Harvard Medical School, Beth Israel Deaconess Medical Center, Health Advancement in Vietnam GDA: IBM, Roche, Johnson & Johnson, GE, Bravo, 3M, Samsung	Missing	Working with three Vietnamese universities in each region of the country, the IMPACT MED Alliance aims to improve the quality and effectiveness of medical education in Vietnam through training in modern pedagogy, use of technology, and integration of clinical content; improve teaching and learning of key skills necessary to ensure a strong, high-quality health workforce; develop leadership for continuous and sustainable innovation; and improve access and outcomes for disadvantaged students, especially ethnic minority doctors and health workers.
Vietnam	Lower Mekong Public Policy Initiative (LMPPI)	2013–2017	Fulbright Economics Teaching Program, Harvard Kennedy School Grant	$4M	LMPPI is establishing a network of knowledge partners to engage in cross-disciplinary and cross-border research collaborations around sustainable development. The project is based out of Vietnam's Fulbright Economics Teaching Program. The project uses policy dialog activities to create a forum for a broad range of government, private sector, and other key parties across the region to discuss common dilemmas.
Vietnam	University of Dong A, Quang Nam Campus Support Program	2014–2016	Vietnam Assistance for the Handicapped American Schools and Hospitals Abroad (ASHA) grant	$500K	The project is developing capacity for training in electrical, nursing, and hospitality management trades to equip young people with practical academic lessons, hands-on experience, and needed skill sets to work and to improve access to services for vulnerable groups, such as the disabled people, ethnic minorities, and the poor. The program is also providing equipment and commodities for the training facility.
Vietnam	PEER		NAS, local research grantees Grants	Various small grants	PEER Vietnam supports collaborating research projects between US and Vietnamese researchers in the priority area of biodiversity. The US-based researcher must have secured funding from a US-based researcher funder. USAID then provides funding support for the Vietnamese research collaborator.

Country	Project Name	Years	Partners & Mechanism	USAID Funding	Description
Various	Feed the Future (FtF) Innovation Labs	Vary	Sixty-five US universities leading 24 Innovation Labs in partnership with local research and education institutions Cooperative agreements	Varies	Of the 24 FtF Innovation Labs, 14 have activities in Asia, particularly Bangladesh, Burma, India, and Nepal. These programs pair one or more US universities with one or more partner country education or research institutions to conduct applied research and engage in capacity development around a narrowly focused food security research area, such as applied wheat genomics, climate-resistant bean development, and post-harvest loss reduction. See Annex A for a list of the 14 FtF Innovation Labs with a presence in Asia.
Washington, DC	HESN	2012–2017	Eight networks of US and local universities and research centers Cooperative agreements	$125M; $15M to $25M per network	HESN is a program aimed at leveraging the collective talents of university students and professors to provide R&D for development innovation and progress. The program works through eight networks, seven of which are headed by US universities (one is led by Makerere University in Uganda), totaling 650 institutions across 65 countries. Outside of the one network focused solely on Africa, the other seven include Asia-based work, particularly in India and Nepal. For example, the Aid Data network led by William & Mary worked with Kathmandu University, Freedom Forum, and Open Nepal to create the Nepal Open Data Working Group, which brings together civil society, government, and donors to discuss current opportunities and challenges to apply geospatial data to development. See Annex B for a list of HESN activities in Asia.

4.2 Programmatic Reflection of Obama Administration Policy Trends

Research Question 2: How do these programs reflect the major development and foreign policy trends of the second term of the Obama Administration?

The research team assessed the inventoried programs against the review criteria to determine broad patterns, not to evaluate any one program against these trends. For each program, the team reviewed available documents and gave the program a score for each criteria: highly reflective, partly reflective, and not reflective, to indicate the degree to which the program reflected different policy or strategy trends.

In general, the programs reviewed demonstrated pronounced characteristics of these major trends, with some notable outliers. On the high end, all programs reviewed spoke to skills or workforce development and R&D in support of county development goals—the tenants of Goal 1 of the USAID Education Strategy. Given the broad nature of that goal, this finding was not surprising. Also, key USAID Forward reforms were highly aligned, particularly engagement of the private sector and partnerships with local organizations. Although neither of these elements was necessarily new to USAID with the onset of USAID Forward, both received great emphasis, as evident by 68% of higher education programs in Asia highly or partly engaging the private sector and 90% engaging local organizations and implementation partners at some level.

In other USAID Forward reform areas, the results were more mixed. The reviewed higher education programs are, perhaps not surprisingly, highly reflective of an agency focus on science and technology. Yet, the program delivery methods and activity areas do not demonstrate a strong focus on "game-changing" solutions, such as use of mobile technology. In fact, very few of the programs provide support for distance learning or engage open education resources, such as Massive Open Online Courses (MOOCs), with some notable exceptions. It appears, based on this review, that USAID higher education programs support science and technology upgrading at partner institutions with relatively traditional means and methods. In the important focal areas of scale and sustainability, most programs spoke to these issues and provided provisions for achievement, though few were highly focused or showed significant results.

The area with the least evidence of programmatic alignment was Asia Pivot in US foreign policy. Asia Pivot is difficult to define and, although spoken of quite often in the region, is not well operationalized, making program impact more difficult to determine. Some countries have taken a strong institutional linkage and people-to-people approach (Indonesia) consistent with the Asia Pivot focus on "improving working relations." Others have significantly embraced regional multilaterals (the two RDMA programs). A handful of programs make specific reference to market openings (the Burma programs). However, these were exceptions and the general evidence is that loosely defined Asia Pivot does not seem to be highly reflected in USAID higher education programs.

Figures 3 through ***12*** display the review findings for each of the ten criteria.

Figure 3: USAID Education Strategy Criteria

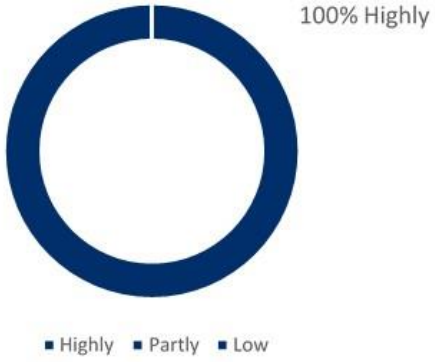


Figure 4: Local Partner Engagement Criteria

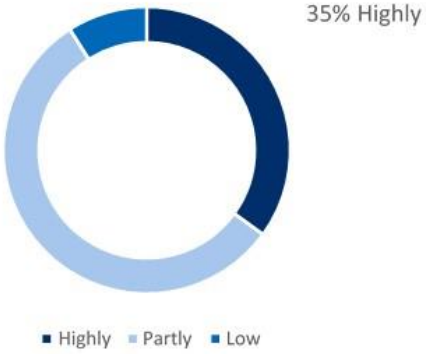


Figure 5: Private Sector Engagement Criteria

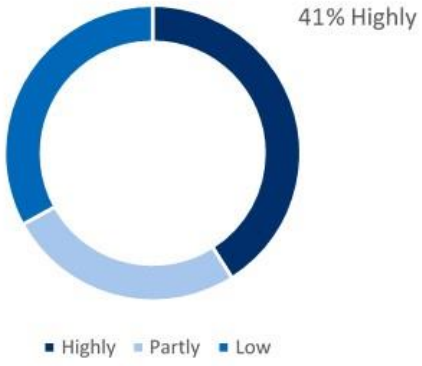


Figure 6: Focus on Science and Technology Criteria

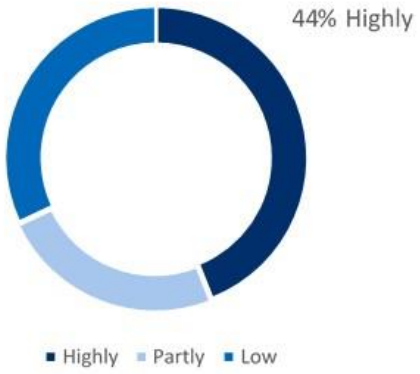


Figure 7: Focus on Innovation Criteria

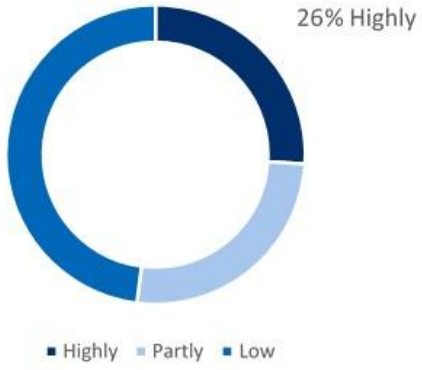


Figure 8: Strategic Approach to Scale Criteria

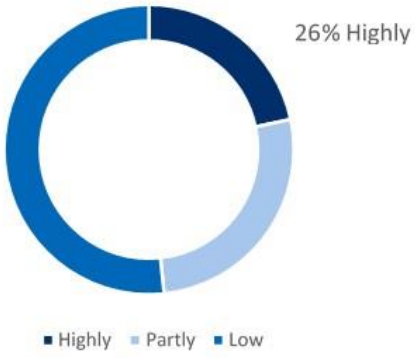


Figure 9: Strategic Approach to Sustainability Criteria

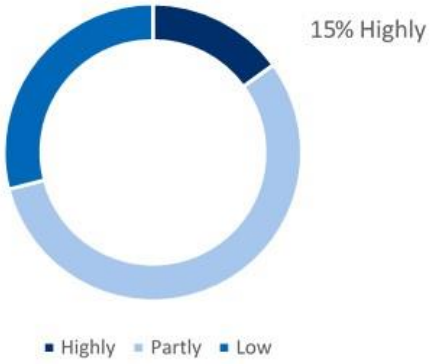


Figure 10: Improve Working Relations Criteria

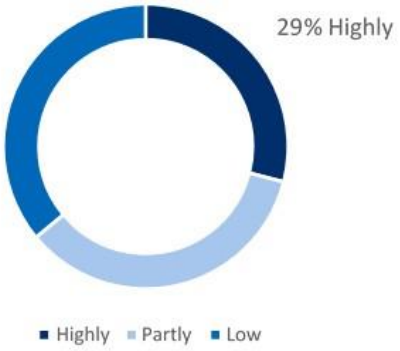


Figure 11: Engaging Multilaterals Criteria

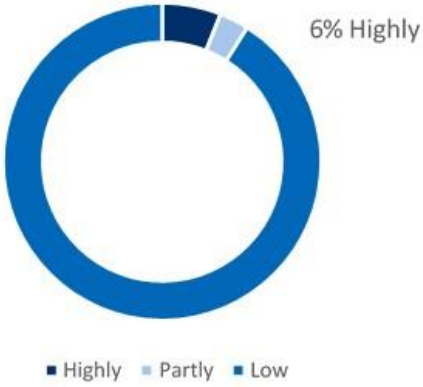
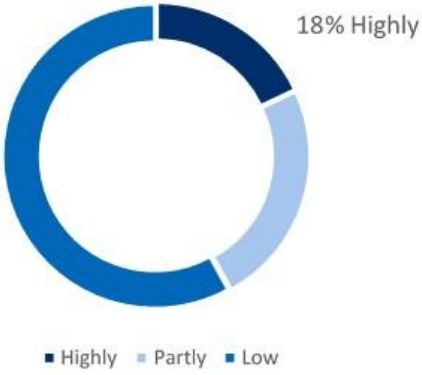


Figure 12: Expand Market for the US Criteria



4.3 Case-Studies of Highly Aligned Programs

Question 3: What outcomes did programs highly reflective of certain trends achieve? What elements are recommended for future programming?

For each of the ten criteria included in the assessment, the research team has selected one program that was assessed as being "highly reflective" of that criterion. These example programs are described in short case studies that illuminate the criteria in question and provide some evidence of impact. To demonstrate the diversity of programs in the region and promote broader learning, no program was selected twice, though several could have been included multiple times.

#1: Evidence of program focus on workforce skills development in support of country development strategy.

COMET: The press release issued[11] by USAID on the day the COMET program launched noted that COMET would "empower students with essential skills to thrive in the workplace." More than any of the other programs assessed, COMET embraces the USAID Education Strategy's focus on workforce development aligned to partner country development goals. COMET is premised on understanding the economic competitiveness issues its Southeast Asia target countries face and helping them individually and collectively develop responsive workforce development programs. Industry focus to date has been on science, technology, engineering, math, accounting, and tourism skills and jobs.

COMET's basic program model is to develop a flexible "sourcebook" (or toolkit) of best practices in demand-driven workforce development (e.g., building industry partnerships, linking curriculum to industry needs, blending applied classroom and work-based learning) and then provide grants to various target institutions to adopt these approaches, becoming a network of Mekong Learning Centers. In addition to training on the sourcebook, COMET helps these schools enhance their educational delivery and serve additional students through integration of appropriate educational technology. It also helps connect these schools to committed private sector partners, especially around work-based learning opportunities. These Mekong Learning Centers each commit to aggressive reform agendas based on the COMET approach, as well to developing, with COMET's assistance, Master Trainers that can extend the reforms to a network of other institutions in their areas.

Now in Year 2, COMET has successfully completed two annual labor market assessments for the region, developed the sourcebook, established the initial set of Mekong Learning Centers, and made progress on private sector partnerships for each, with a specific focus on new work-based learning models. COMET is also in the process of improving education technology for these schools and their networks. Over the next three years, COMET plans to reach 100 institutions with this model and contribute to the skill-based education of 250,000 young people.

#2 USAID Forward: Evidence of significant resources flowing to local partners.

STRIDE: The STRIDE program seeks to develop the governance systems, physical infrastructure, human capital, and connective networks needed to advance R&D in large secondary cities of the Philippines. Roughly 30% of the funding ($9.5 million of $31.5 million) awarded by USAID for STRIDE is dedicated to local organizations. This funding goes to three main places, each supported by USAID implementers with capacity development, monitoring and evaluation, and other technical support:

- The STRIDE program will make $6.2 million worth of small grants ($100,000 or less each) to Filipino researchers or researcher centers, provided they have a private sector partner and US researcher collaborator (similar to PEER). In the first year, STRIDE implementer RTI received very few quality grant applications and had to increase its grant writing workshop efforts, broker relationships between Filipino researchers and potential collaborators, and ensure adequate capacity support for the grants they do make.

[11] https://www.usaid.gov/asia-regional/press-releases/mar-25-2016-usaid-announces-partnership-universities-industry

- STRIDE provides $2.5 million to the government of the Philippines (Commission of Higher Education Development [CHED]) to help administer its Philippine-California Advanced Research Institute, an initiative with the University of California system in the US. The USAID funding allows CHED to hire consultants to develop strategic plans, new programs, and administration of the funded programs.
- Last, STRIDE provides $750,000 in support to PBED, a private sector, university, and government coalition that identifies, advocates, and helps implement education reform initiatives in the Philippines.

Several important elements of these investments might contribute to their success, though STRIDE has not been evaluated to date. First, the funding is disbursed to local organizations for ideas or projects that are self-generated, and in many cases are ongoing. These are Philippines-led efforts that are in need of funding and technical assistance, which STRIDE provides. Second, the funding amounts are modest in individual size—allowing for lower capacity organizations to successfully manage these efforts—but significant in their total amount. Third, they target a diverse range of actors: engaging researchers, community service organizations (CSOs), and government agencies.

#3: Evidence of significant involvement of private sector partners.

Generation India: In 2012, McKinsey & Co released its flagship report, Education to Employment: Designing a System That Works,[12] advancing evidence of new models for demand-driven training at scale. After distilling critical elements from more than 100 programs from 25 countries, McKinsey decided to implement its own program. The first program under its newly formed McKinsey Social Initiative, *Generation,* is a large public-private partnership among USAID, the Wal-Mart Foundation, Gallup, McKinsey, and 328 local employers in five countries: the United States, Mexico, Spain, Kenya, and India. The program aims to train and place one million young people in work in five years, or roughly 100 times what USAID achieves for similar sized investments ($15 million). When USAID Forward charged missions with developing transformative, high impact partnerships, this type of program was the goal.

To develop *Generation* in each country, McKinsey consultants spend several months visiting potential private sector partners, attempting to understand their training approach, return on investment (ROI) metrics, and the exact, job-based skill needs of these employers. Using these data, a training program is built, typically 6-8 weeks in duration, that mimics these work places, simulates real work experience, and takes an integrated approach to soft, life, and technical skills instruction to producing work-ready graduates for private sector partners. The private sector partners commit to not only informing this approach and reviewing curriculum over time but also hiring a certain number of *Generation* graduates and offsetting training costs based on a customized ROI model. The program is laser focused on driving down training cost and offsetting it with private sector funds to reach vulnerable work seekers and promote sustainability.

In India, *Generation* is focused on the health care and food and beverage fields across nine locations. One year into operations, private sector partners now include Fortis Memorial Research Institute, Indus Cancer Hospital, Hyderabad, KIMS Hospitals, MS Ramaiah Memorial

[12] Barton, D. Farrell, D., & Mourshed, M. (2013). Education to employment: Designing a system that works. McKinsey Global Institute: New York, NY.

Hospital, Manipal Hospitals, Manipal Integrated Services, Max Healthcare, Max Smart Super Specialty Hospital, and Medanta.

#4: Evidence of significant focus on science and technology for development.

HEEAP: Of the eight higher education programs USAID Vietnam has funded during this review period, six of them deal squarely with promoting science and technology development for economic growth. This focus follows Vietnam's rapid economic growth trajectory from being one of the world's poorest countries in the 1990s to one of the world's strongest emerging economies, having reduced its poverty rate from 60% to 20% over that time period. Yet, as the World Bank notes in its 2012 report on poverty in Vietnam, titled, "Well begun, not yet done—Vietnam's remarkable progress on poverty reduction and the emerging challenge,"[13] poverty reduction has been driven by industrialization and labor-intensive manufacturing. To continue this program and accelerate it, Vietnam seeks to develop an innovation economy that moves up global value chains and creates small and medium businesses that employ more people. As found elsewhere, a strong STEM workforce, particularly engineering, is critical to achieving this goal.

HEEAP seeks to "transform" engineering education at five large technical universities and three vocational colleges that span Vietnam. To do so, implementation lead ASU partnered with four large technology companies (Intel, Siemens, Cadence, Danaher) and the Accreditation Board for Engineering and Technology (ABET) in the United States to devise a faculty professional development program, vet and fund faculty-led reform projects (most of them curriculum focused), install new technology in classrooms and labs, and promote job-ready graduates through improved teaching and better industry-academia linkages. Nearly 300 faculty have now participated in six-week intensive training in Arizona, developed and implemented reform projects, and participated in follow-on training back in Vietnam. The program has attracted two new private sector partners (Pearson and National Instruments) and funding from the government of Vietnam, allowing it to continue well past the end of its USAID funding in 2014.

A 2013 evaluation of HEEAP found that the engineering focus of HEEAP was well aligned to industry, government, and higher education leadership goals. It questioned, however, how training a relatively small number of Vietnam's mechanical and electrical engineering faculty (12% of which have been trained by the program to date) can "transform" engineering education in Vietnam. USAID and ASU sought to move beyond one-off faculty training by supporting faculty-led reform projects, such as instituting ABET-aligned course sequences; using technology for managing large class sizes; and promoting student center learning experience. They then shared these ideas with the HEEAP network through annual conferences. In addition, USAID Vietnam funded the VULII program to extend HEEAP reforms instituted widely through governance and administrative reforms.

#5: Evidence of significant focus on innovation, especially mobile solutions.

PEER: In the Vietnamese Mekong Delta, government officials lacked good data for monitoring groundwater usage, hampering decision making about how best to regulate use and protect the watershed. That is, until Dr. Nguyen Duc Luong, a researcher at Vietnam's National University of Civil Engineering, received a USAID Vietnam PEER award. Dr. Luong's research project,

[13] Badiani, Reena et al. (2013). "2012 Vietnam poverty assessment: Well begun, not yet done—Vietnam's remarkable progress on poverty reduction and the emerging challenges." Washington DC: World Bank.

"Application of geodetic, satellite remote sensing and physical modeling tools for management of operational groundwater resources in the Red River Delta, Vietnam"[14] paired him with National Aeronautics and Space Administration (NASA) funded scientists at the University of Washington. Together, the coordinated research teams developed new remote sensing and modeling techniques to monitor groundwater usage in the region. To aid uptake of the data, they provided training to Vietnamese officials. Along the way, the Vietnamese researchers gained capacity and received support and new equipment while establishing new research networks.

This program is but one of 12 PEER projects funded in Vietnam and one of the 110 funded in the Asia region during this period. Vietnam, India, Indonesia, and the Philippines have dedicated bilateral programs that buy into the larger PEER program managed by the NAS in Washington. RDMA also runs several programs for regional integrated work, and 15 countries in the region have at least one PEER awardee. PEER takes advantage of already-funded US-based scientists who have grants from the National Science Foundation, NASA, National Institutes of Health, and others. The US investigators then partner with a potential USAID funded researcher to submit an application. The USAID awards range from $40,000 to $80,000 and can be spent on training, research, travel, publication, and presentation activities.

PEER has not been evaluated, however, at the highest level, NAS describes PEER as a "key element" to USAID's goal of "bringing together a diverse set of partners to discover, test, and scale breakthrough solutions to address critical challenges in international development," with PEER providing "scientific and technological research" to this cause. PEER also aims to support US country-level strategies as well as build individual research capacity and create dense researcher networks among countries. The goal of supporting breakthrough solutions is a core pillar of the USAID Forward focus on science, technology, and innovation, and a desire by many in the agency to return to the time when USAID was behind "game-changing" discoveries, such as the Green Revolution work in India in the 1960s. Although it is unclear whether PEER will live up to these high expectations, the program is certainly aligned in its approach.

#6: Evidence of strategic approach to achieving impact at a meaningful scale.

EIG: The EIG program reached 75,000 beneficiaries in 15 different rural Nepalese districts, with 76% of beneficiaries gaining employment and the average beneficiary's income increasing by 60%. This cost USAID $14.7 million, or roughly $200 per beneficiary. Compared with typical USAID workforce development programs, EIG is five times larger and five times cheaper per beneficiary.[15] EIG is well known with USAID for its scale and impact, as documented in an external evaluation and Government Accountability Office audit, both conducted near the end of the program. How EIG reached such scale and impact is worth examining.

EIG used an integrated "pathways" model that brought most participants into the program through nonformal literacy, numeracy, and agricultural productivity courses. These courses where set up by six local providers in dozens of villages and district centers and allowed for participation at low cost and without participants (none of whom were women) leaving work or child care duties. During this basic education period of the program, participants were given

[14] http://sites.nationalacademies.org/PGA/PEER/PEERscience/PGA_168071
[15] This comparison is made using rough estimates of USAID workforce development programs that typically reach 10,000 to 15,000 beneficiaries for approximately $10 million to $15 million.

various diagnostics and provided career counseling. When the entry training was completed, the participants selected into various tracks based on their interests and abilities: vocational training, entrepreneurship training, agri-business support, or scholarships to higher level formal education training. Vocational training providers were required to place participants in work to get paid, and enterprise development was linked to agricultural value chain growth as well as needed local services, such as restaurants and retail. The program appealed to participants based on its low cost, accessibility, flexibility, transferable skills, and immediate payoffs in income.

Although EIG was initiated as a conflict reduction program in Maoist uprising regions, its reputation as an effective livelihoods and workforce development program is well deserved. EIG's final evaluation indicates that the local providers continue to perform well and that program approaches might have indirectly benefited another 30,000, bringing the program to 100,000 people affected—a very large-scale program by USAID standards. Clearly, this type of nonformal education and enterprise development support is not right for every Asian economy and every USAID mission, but for those considering such programs, it is a model worth considering.

#7: Evidence of strategic approach to achieving meaningful sustainability.

AIP: The AIP program worked in three Indian agricultural universities to improve agriculture research, teaching, and extension services. A Feed the Future Program, AIP is one of many USAID agriculture programs that target higher education institutions, given the need for better agriculture research and the powerful outreach and extension potential of rural universities. Led by Cornell University, the AIP implementation team focused intently on developing and piloting transferable models within the three initial universities—an effort that has greatly paid off as program models were extended in India to an additional 79 universities by the World Bank and used to inform donor programs in Nepal and Malawi.

The models that were developed by AIP include: (i) An e-learning program that incorporated existing distance courses from US partners and provided the equipment and capacity for institutes to develop their own e-courses; (ii) teaching excellence certificate training programs; and (iii) mobile solutions activities that make short-course and agricultural information available to farmers through mobile (tablet) enhanced extensions services. A survey conducted in 2013 shows high levels of user satisfaction with these models, and a final evaluation of the program noted their replicability as a package and individually.

There appear to be two main elements that make these AIP models sustainable. First, there is very low cost to accessing the e-learning training courses and mobile-enhanced extension services once they have been developed. Initial development (e.g., equipment for filming or animating a course, procuring tablets for extension agents) can be expensive, and there are some operations and maintenance costs thereafter. However, given the declining costs of technology and advanced usage of it by universities in India, these are not insurmountable barriers. Once developed, students, professors, and farmers in the field can view the courses at low or no cost. Investing in equipment and training also allows for the development of new courses, as needed. Second, the teaching certificate bestowed upon completion of the course gives its recipients credibility in the labor market and makes the program attractive to others, driving demand and upkeep of the teacher trainer program.

#8: Evidence of significant people-to-people exchanges and institutional linkages between the United States and partner country.

PRESTASI: The Education and Cultural Affairs branch of the US Department of State supports a wide range of exchange programs, part of what is called "education diplomacy." USAID was also once well known for running such programs, particularly with Africa, but these programs are now much rarer in development assistance as a result of their high per-participant costs and mixed or difficult-to-determine impacts.[16] For these reasons, the PRESTASI II program in Indonesia and the Hillary Clinton Scholarship Program in Timor-Leste stand out. Both programs solely focus on providing scholarships for students to study (primarily) in the United States. PRESTASI II is the older and larger program and used here as a case example.

The PRESTASI II program responds directly to mandates within the US-Indonesia comprehensive partnership agreement signed in 2010 by President Obama and then Indonesian President Yudhoyono. The education pillar of the agreement commits the United States to investing $165 million over five years in programs facilitating "the vital exchange of leadership and management experience, scientific and technical expertise, and cultural understanding between Americans and Indonesians" and specifically calls for expanding exchange programs. The PRESTASI II program, initiated in 2012 in the wake of this agreement, can be seen in this light.

The USAID Indonesia education office and several other technical offices (environment, health, economic growth, and democracy and governance) jointly fund the PRESTASI II program with the strategic intent of developing the performance and leadership skills of Indonesian professionals in priority development areas. Overall, the program will provide short- and long-term training opportunities to 100 Indonesian professionals, the majority of whom will pursue master's degrees in the United States. Recruitment of candidates emphasizes diversity and intentionally seeks qualified recipients from marginalized groups. PRESTASI II has not been evaluated, and the impact of programs like it is difficult to measure. Typically, the participants themselves have excellent experiences, develop advanced competencies (especially in English and IT), develop international networks with peer professionals, and often return to their country of origin to gainful employment. These programs accomplish goals of "improving working relations" and promoting person-to-person linkages, though the scale of such efforts remains small given the cost and the development impact is less certain. PRESTASI II is supporting an alumni association for USAID-funded exchange program alumni, a practice thought to sustain and multiply impact as alumni support each other and pursue joint initiatives.

#9: Evidence of significant engagement of Asia-based multilateral organizations.

One-Health Workforce Network: The One-Health approach, which USAID has supported in both Africa and Asia, is premised on two important network precepts: (i) emerging, pandemic diseases pass from animals to humans, requiring similar training and common language among animal, human, and environmental health professionals and across disciplines (medicine, public health, epidemiology, agriculture, and ecology); and (ii) these diseases are transborder, requiring regional approaches and strong networks to combat, such as Avian Flu in Asia and Ebola in Africa.

[16] Gilboy, A., Carr, H., Kane, T., Torene, R., (2004). Generations of Quiet Progress: The Development Impact of US Long-Term University Training on Africa from 1963 to 2003. USAID: Washington, DC.

In Asia, USAID is supporting the One-Health Workforce programs, led by the University of Minnesota and Tufts University Public Health and Veterinary schools to develop a core curriculum and common training approaches for animal and human health specialists. A regional network of 13 universities from Indonesia, Malaysia, Thailand, and Vietnam called the Southeast Asia One-Health University Network has been formed and commits to adapting country-specific curriculum from the One-Health core. The broader ASEAN University Network also promotes the approach and supports the One-Health program.

Modeling the "extension" approach that many health and agriculture programs employ when working with universities, One-Health will not only develop curricula and training modules but also support field experiences and outreach tools to ensure that future graduates are prepared to address the complex, multisectoral disease detection, response, prevention, and control challenges in their countries and regions. The program also offers services and training opportunities for the existing workforce through improving and introducing professional development and continuous education offerings.

#10: Evidence of significant program support for market gains for US businesses in Asia.

ADEPT and ADAPT-IT Burma: In 2012, when USAID reopened its programs in Burma after 50 years, the reopening paralleled similar reopenings for US businesses and US higher education interests in Burma. USAID program designers knew of the strong interest and intentionally crafted a higher education solicitation that invited ideas from the private sector and the US higher education community. After a high-profile funding announcement that elicited high demand from these constituencies, USAID ultimately funded three of them: ADEPT and ADAPT-IT, plus a third partnership among Johns Hopkins, Exxon, the Luce Foundation, and Serge Pun & Associates called "Making a Difference for Myanmar," which ultimately had to be discontinued as a result of academic freedom issues.

The ADEPT and ADAPT-IT programs involve two major US universities with a strong interest in Asia (the University of Washington and Indiana University), several major multinational corporations looking to access the opening Burma market (Microsoft, HP), a Vietnamese-based bank looking for new investment opportunities (VinaCapital), and a nonprofit business association that represents more than 250 corporate clients in responsible business practices globally (BSR). Many BSR clients have an interest in Burma but want to approach it ethically and responsibly.

The approach that ADEPT and ADAPT-IT take to market penetration—although delivering development results, one of USAID's core private sector tenants of shared value—are different in important ways. ADEPT, the entrepreneurship program that pairs Indiana University with HP, VinaCapital, and BSR, aims to spur SME growth through better entrepreneurship curriculum and teaching at the Yangon Institute of Economics and support for would-be entrepreneurs and existing enterprises through the HP Life e-learning curriculum, access to finance from VinaCapital, and opportunities to engage in global business best practices (ethics, labor, environment) with BSR. Indiana University now also implements the US Department of State-funded Burma Youth Leadership Program, which brings young Burmese leaders to their campus, and hosts Burma integration conferences with ASEAN, USAID, and the US Department of State to promote understanding of access to Burma, further entrenching Indiana University's role in the Burma market.

ADAPT IT—the ICT promotion program implemented by the University of Washington and Microsoft—created physical spaces in libraries, universities, CSOs, and other public and private organizations equipped with Microsoft hardware and software, supported by the University of Washington. The spaces provide not only provide immediate access to the world beyond Burma but also ICT literacy opportunities and familiarity with Microsoft products and the University of Washington as an education option. The program accomplishes USAID objectives of building the human-institutional capacity of key Burmese higher education institutions, while promoting connectivity within Burma and between Burma and the outside world. Like ADEPT, the program also advanced Asia Pivot objectives of market penetration for US entities.

International Research and Science Programs

Feed the Future Innovation Labs and HESN: Under the broad heading of "International Research and Science Programs," USAID supports a number of global programs, funded by Washington Bureaus, that partner with developing country scientists to develop solutions to difficult development challenges. The PEER program, covered earlier, falls into this category, as do the FtF Innovation Labs and HESN. According to USAID, these types of programs endeavor to "empower developing country scientists to build the capacity of their own countries and address critical development challenges with innovative solutions" and "use science and technology as a common language for enhanced bilateral engagement that strengthens the global scientific and research ecosystem;" while building "robust interpersonal relationships, which foster broader scientific progress" among other aspects.[17]

Yet, these programs do not take explicit capacity development approaches, per se (they employ limited training, strategic plan formation, process improvement, or resource and financial provisioning), but rather focus on "learning by doing," as networks for peers (US and developing country scientists and students) engaged in collective R&D, publication, and technology transfer. For example, HESN describes itself first as a movement that develops and deploys low-cost, scalable solutions to global grand challenges, and second as "a vibrant collaboration among more than 650 partner institutions in academia, civil society, and government in more than 65 countries."[18] From a higher education development perspective, such efforts might have minimal impact at the institutional level, in terms of sustainable reforms that advance the quality of higher education or access to it in partner countries. Undoubtedly, institutional and individual linkages are formed, and some of those sustain, creating a multiplier of efforts to harness the power of higher education, science, and technology for development. The real impact of these efforts will be felt in the quality of products, services, and solutions developed and deployed in the developing world. As Annexes A and B of this report make clear, the FtF Labs and HESN are both quite active in Asia and have produced a long list of activities and outputs. As products emerge, grow, and present opportunity for evaluation, it will be easier to evaluate the full impact of these efforts.

5. Discussion

The strategy and policy trends assessed in this review are not mandates or program requirements, per se. They are broad directions, funding parameters, and agency targets that

[17] https://www.usaid.gov/what-we-do/GlobalDevLab/international-research-science-programs
[18] https://www.usaid.gov/hesn/fact-sheets/college-william-and-mary-aiddata-center-development-policy

have the potential to influence program design and implementation. This study found that some trends are more reflected in USAID higher education programs in Asia than others, with an overall finding that the programs are not "highly reflective" of these trends as a whole. If this conclusion is correct, there could be several reasons.

Limited awareness: The Asia Pivot pillars, in particular, might not be well defined or well known by USAID professionals working on program design and management. Such might be the case particularly for engagement of regional multinational bodies, such as ASEAN, given that most programs are bilateral and do not inherently take a region-wide lens. There might also be a lack of information about which regional bodies to engage, and how and where they would fit into a higher education program. This issue of awareness might also apply to the Asia Pillar elements of market access and improving working relations, often seen as more of the domain of the US Department of State or US Department of Commerce rather than USAID.

Limited funding: Several of the elements assessed could be cost-prohibitive to fully embrace or be crowded-out by other elements in cases of limited or scarce resources. As noted, these USAID higher education programs were generally low-budget programs, many at the $1 million to $2 million level or below. Participant training in the United States (an "improve working relations" staple) might have been immediately off the table for these programs or implemented at very low volume, given the costs of such exchanges. For example, a USAID-funded master's degree program in the United States can cost $200,000 per participant. Although not exactly linear, scale is also affected by resource levels, though sustainability might be improved as low-budget programs seek creative implementation approaches possibly more likely to be sustained. Last, funding levels might have an impact on local organization engagement and direct funding. Some programs, such as STRIDE and SHERA, made awards to large US organizations and then mandated that they sub-grant funds to local organizations while providing capacity building and oversight. Others, such as several of the small Philippines programs, made direct, small awards to local partners.

Competing priorities: In a scenario where a program design team and implementing partner are aware of this full set of program expectations, their achievement as a group might be hampered by one or more expectations or "trends" being seen as the most important. Indonesia is a good example of this challenge, where the high-profile Comprehensive Partnership—negotiated at the White House level and actively monitored by both countries—prioritized institutional linkages and increasing the exchange of people, possibly resulting in PRESTASI II, the University Partnerships Program, and SHERA, and eschewing or delaying programs more focused on workforce development, a pressing need in Indonesia.[19] Likewise, the vast diversity of programs in the Philippines, some focused on nonformal, out-of-school youth education in remote regions and others focused on scientific R&D and entrepreneurship promotion in major urban centers, might be the result of changing US embassy, USAID mission, and country leadership prioritization of certain types of programs. Developing a program that checks many boxes is difficult when one box gets all of the attention.

Not my burden to bear: All of the criteria reviewed by this study emanate from Washington. The USAID Education Strategy was developed and rolled out from Washington. The USAID Forward reforms were squarely viewed by many in the field as Washington priorities. The Asia Pivot

[19] It should be noted that USAID Indonesia is now in the process of launching a portfolio of workforce development programs.

mandates existed more in diplomatic doctrines and speeches, most delivered far from the confines of USAID programs, making them feel distant or diffuse. To the extent that these reforms seemed imposed from the outside and not relevant to one's context or program, particularly CDCS, some programs might have hoped that alignment with these requirements might be led by other sectors or projects or even other countries.

Without more extensive primary data collection and retrospective analysis, it is difficult to exactly say what drives the data reported here. Further, given the lack of evaluations conducted of these programs, it is even more difficult to determine the impact these program design decisions have. Evaluated programs such as HEEAP show that the program achieved its private sector engagement and focus on critical economic growth driver objectives but fell short in the scale of its approach (only training 12% of faculty in two engineering sub disciplines) and that, without VULII, would have missed the mark in terms of coupling human capacity development with institutional reforms. HEEAP might have made tradeoffs in its approach, perhaps at the request of its significant private sector partners or as a result of its focus on high-level mechanical and electrical engineering education, illustrating the internal dynamics of just one program.

The implications of this study are that higher education is clearly important to USAID development objectives, as seen in recent research showing significant individual and public rates of return to investing in higher education and by the sheer number of programs USAID pursued in this area over a five-year period in one region. However, the research team also notes that higher education is a broad, contested space, ranging from immediate post-secondary-level skills training for entry-level work to upper tertiary programs focused on advanced R&D, tech transfer, and the education of a country's future leaders in critical sectors. Higher education also serves important diplomacy objectives and meets demands from US universities and private sector partners for engagement with USAID programs, a trend the research team saw in these programs.

Better evaluation of programs and understanding of component-by-component impact and cost benefit is critical to future understanding of how best to design and implement donor-funded higher education initiatives. These evaluations must be country- and region-specific, given diversity within Asian countries, among Asian countries, and between Asia and the rest of the world. In lieu of such understanding, USAID seems likely to continuing pursuing a wide range of such offerings.

6. Conclusion

The charge of this study was to inventory and assess the universe of USAID higher education programs during the latter half of the Obama Administration, a period in which significant foreign policy and development assistance reforms were advanced. The research team found a high number of programs with a diverse range of objectives, sectoral focus, and program modalities. These programs were, at times, highly reflective of current development and diplomacy trends and at other times seemingly isolated from them. Perhaps such diversity is appropriate for the broad higher education space and the wide range of Asian countries. This determination is difficult to make and calls for better evaluation of these types of programs and understanding of the programs that are highly aligned with one criteria or another, as highlighted in the case study section of this paper.

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Annex A: USAID Feed the Future Innovation Labs with Asia Country Presence

Program information taken from a USAID fact sheet found at: https://feedthefuture.gov/sites/default/files/resource/files/fact_sheet_feed_the_future_innovation_labs_oct2015.pdf

Feed the Future Innovation Lab for Applied Wheat Genomics

Lead University: Kansas State University

This Innovation Lab develops heat-tolerant, high-yielding, farmer-accepted wheat varieties through local characterization and breeding networks, using the most advanced genomic tools.

Focus Countries: India, Mexico, Pakistan.

Director: Jesse Poland, jpoland@ksu.edu • Website: www.k-state.edu/wheat-innovation-lab/

Feed the Future Innovation Lab for Aquaculture & Fisheries Lead

University: Oregon State University

This Innovation Lab develops comprehensive, sustainable, ecologically compatible, and socially viable aquaculture and innovative fisheries management systems that contribute to poverty alleviation and food security.

Focus Countries: Bangladesh, Burma, Cambodia, Ghana, Kenya, Nepal, Philippines, Tanzania, Uganda, Vietnam

Director: Hillary Egna, hillary.egna@oregonstate.edu • Website: http://aquafishcrsp.oregonstate.edu/

Feed the Future Innovation Lab for Assets and Market Access

Lead University: University of California, Davis

This Innovation Lab conducts policy-relevant research on how market function and access promotes (or hinders) asset accumulation, competitiveness and the capacity of smallholder farmers and the rural poor to manage economic and climate-related shocks.

Focus Countries: Bangladesh, Burkina Faso, Dominican Republic, Ghana, Haiti, Kenya, Malawi, Mexico, Nepal, Tanzania, Senegal, Uganda

Director: Michael Carter, mrcarter@primal.ucdavis.edu • Website: http://basis.ucdavis.edu/

Feed the Future Innovation Lab for Climate-Resilient Chickpea

Lead University: University of California, Davis

This Innovation Lab brings drought and heat tolerance from wild chickpea relatives to elite chickpea lines used for production in Ethiopia while increasing the capacity of Ethiopian chickpea researchers in molecular breeding and variety characterization.

Focus Countries: Ethiopia, India, Turkey

Director: Doug Cook, drcook@ucdavis.edu • Website: http://chickpealab.ucdavis.edu/

Feed the Future Innovation Lab for Climate-Resilient Millet

Lead University: University of California, Davis

This Innovation Lab is harnessing genomic and advanced molecular tools and proprietary technologies for climate resilience from US-based company Arcadia Biosciences to develop heat- and drought tolerant millet varieties for smallholder farmers.

Focus Countries: India, Mali, Nigeria

Director: Eduardo Blumwald, eblumwald@ucdavis.edu

Feed the Future Innovation Lab for Climate-Resilient Sorghum

Lead University: *University of Georgia*

This Innovation Lab is using new scientific tools to develop drought- and heat-tolerant varieties of sorghum, a staple grain in many countries, which builds climate resilience into sorghum production systems. The Lab is also exploring new approaches to production through the development of perennial sorghum.

Focus Countries: Ethiopia, India, Mali

Director: Andrew Paterson, paterson@uga.edu

Feed the Future Innovation Lab for Climate-Resilient Wheat

Lead University: Washington State University by using conventional breeding approaches, improved breeding tools, and by leveraging genomic resources, this Innovation Lab is helping develop new wheat varieties that can withstand heat stress in the Indo-Gangetic plains.

Focus Countries: Bangladesh, India

Director: Kulvinder Gill, ksgill@wsu.edu

Feed the Future Innovation Lab for Food Security Policy

Lead University: Michigan State University

This Innovation Lab is helping establish policies conducive to market-led, smallholder-focused, inclusive agricultural growth and food security by focusing on country-level research, capacity building, global research and support to donor food policy work.

Focus Countries: Burma, Mali, Malawi, Nigeria, Tanzania

Director: Duncan Boughton, boughton@msu.edu • Website: http://fsg.afre.msu.edu/fsp/index.htm

Feed the Future Innovation Lab for Horticulture

Lead University: University of California, Davis

This Innovation Lab is improving smallholder farmers' abilities to grow, sell and consume nutritious, high-value fruit and vegetable crops by targeting innovative technologies including postharvest handling, increasing research capacity, improving access to information and markets, and ensuring gender equity.

Focus Countries: Bangladesh, Cambodia, Ghana, Guatemala, Honduras, Kenya, Nepal, Rwanda, Tanzania, Uganda, Zambia

Director: Elizabeth Mitcham, ejmitcham@ucdavis.edu • Website: http://horticulture.ucdavis.edu/

Feed the Future Innovation Lab for Integrated Pest Management

Lead University: Virginia Polytechnic Institute and State University

This Innovation Lab is supporting improved, environmentally sustainable yields for smallholder farmers through the implementation of participatory, integrated pest management programs (IPM) in horticultural and grain crops using centers of excellence for dissemination of best IPM practices and scalable solutions.

Focus Countries: Bangladesh, Cambodia, Ethiopia, Kenya, Nepal, Tanzania, Vietnam

Director: Rangaswamy "Muni" Muniappan, rmuni@vt.edu • Website: http://www.oired.vt.edu/ipmil/

Feed the Future Innovation Lab for Livestock Systems

Lead University: University of Florida

This Innovation Lab is working to improve livestock systems by addressing key issues related to livestock value chains, disease management, animal source foods, and enabling policies that drive sustainable local and national agricultural productivity and combat food insecurity and undernutrition.

Focus Countries: Burkina Faso, Cambodia, Ethiopia, Mali, Nepal, Rwanda

Director: Adegbola Adesogan, adesogan@ufl.edu

Feed the Future Innovation Lab for Nutrition

Lead University: Tufts University

This Innovation Lab is identifying ways that policy and program interventions, particularly those that involve agriculture, can most effectively achieve large-scale improvements for maternal and child nutrition.

Focus Countries: India, Malawi, Nepal, Uganda

Director: Patrick Webb, patrick.webb@tufts.edu • Website: http://www.nutritioninnovationlab.org/

Feed the Future Innovation Lab for the Reduction of Post-Harvest Loss

Lead University: Kansas State University

This Innovation Lab is working to reduce post-harvest loss and food waste of durable staple crops (grains, oilseeds, legumes, root crops and seeds) and related processed products by enabling smallholder farmers, cooperatives, agribusinesses, NGOs and other stakeholder partners improve moisture measurement, drying and storage techniques, insect and mycotoxin prevention, and market-based value chain access.

Focus Countries: Bangladesh, Ethiopia, Ghana, Guatemala

Director: John Leslie jfl@ksu.edu • Website: www.reducePHL.org

Feed the Future Innovation Lab for Sustainable Intensification

Lead University: Kansas State University

This Innovation Lab focuses on integrated farming systems research and technologies to sustainably increase agricultural productivity and income that provide food security and nutrition to smallholder farmers.

Focus Countries: Bangladesh, Burkina Faso, Burma, Ethiopia, Ghana, Senegal, Tanzania
Director: Vara Prasad, vara@ksu.edu • Website: www.k-state.edu/siil

Annex B: Higher Education Solutions Network Activities in Asia

Table 1 is a listing of solutions developed by HESN activities and deployed in Asia.

Table 2 is a list of all HESN outputs (products, reports, events) in Asia.

All data are reported as it was received from the HESN office at USAID. RTI did not edit for language.

Table 1: HESN Solutions Deployed in Asia, 2012-2016

Name of Solution	Focal Country	Description
ClickMedix	Bangladesh	Brings affordable and quality health services to underserved populations by connecting patients to doctors through mobile technologies and community-based health providers to achieve continuous healthcare delivery to patients.
Income for Information: Estimating the Value of Time	Bangladesh	Testing mobile phones and base stations to detect mobile payment transactions.
Electrochemical Arsenic Remediation (ECAR)	Bangladesh	ECAR arsenic removal technology
We Care Solar	Burma	Promotes safe motherhood and reduces maternal mortality in developing regions by providing health workers with reliable lighting, mobile communication, and blood bank refrigeration using solar electricity.
Operation ASHA	Cambodia	Works to prevent and treat tuberculosis with the ultimate goal of eliminating TB among disadvantaged communities by utilizing SMS and biometric technology to ensure treatment adherence.
ClickMedix	China	Brings affordable and quality health services to underserved populations by connecting patients to doctors through mobile technologies and community-based health providers to achieve continuous healthcare delivery to patients.
We Care Solar	China	Promotes safe motherhood and reduces maternal mortality in developing regions by providing health workers with reliable lighting, mobile communication, and blood bank refrigeration using solar electricity.

Name of Solution	Focal Country	Description
ayzh Clean Birth Kit	India	The ayzh Clean Birth Kit in a Purse is a simple $2 birth kit containing the six essential tools required to ensure safe and sterile conditions at the time of childbirth. At a price that is 50% lower than comparable birth kits and with minimal marketing and sales effort, ayzh has sold more than 50,000 kits in India, Haiti, Laos, Afghanistan, and Africa, with demand from other countries continuing to grow. Their proposed growth has the potential to prevent deadly or debilitating infections for six million women (direct beneficiaries) over the next five years.
ayzh Clean Birth Kit	India	The ayzh Clean Birth Kit in a Purse is a simple $2 birth kit containing the six essential tools required to ensure safe and sterile conditions at the time of childbirth. At a price that is 50% lower than comparable birth kits and with minimal marketing and sales effort, ayzh has sold more than 250,000 kits in India, Haiti, Laos, Afghanistan, and Africa, with demand from other countries continuing to grow. Their proposed growth has the potential to prevent deadly or debilitating infections for six million women (direct beneficiaries) over the next five years.
ELAI (Safety Harness Vest)	India	A fashionable and multifunctional safety harness vest product targeted at Indian children under 12 years olds.
Green Brick Entrepreneurs	India	Employment generation from eco-friendly mud block construction
Headlamp (Essmart)	India	A low-cost, rechargeable, and high quality headlamp for the Indian market
Helping Babies Breathe	India	A device designed to be used easily by midwives and nurses that provides effective and safe resuscitation, and is appropriate for low resource settings that face material, emergency transport, and human resource limitations.The product envisioned will contain a pumpbased resuscitator with a mask, as well as a positioning pillow that also functions as a heart rate monitor.
Include	India	Include develops products that foster accessibility in spaces that are not disabled-friendly. Include's current products include a Portable Wheelchair ramp and Tactile Signage.
Krest Baby Tempit	India	A simple and innovative temperature measurement device that is specific to the neonatal anatomy, accurate in its read-out, and appropriate for the Health Auxiliaries of the Tribal Health Initiative in the home and village setting.

Name of Solution	Focal Country	Description
PAGIR Birth Spacing	India	The design solution aims to fill the gap between the need for desirable and effective birthspacing methods and access to contraceptives. It consists of a communication tool for the village health nurse to introduce contextually appropriate birth spacing methods according to family specific parameters. We also designed a contraceptive container, designed to remind the couple about their personal commitment to maintain the gap of Birth Spacing, making contraceptives readily available secretly near the bedside.
Rise Legs	India	Rise Legs are lightweight cane-based prosthetic legs for amputees with which they can not just walk, but run, play and dance! Rise Legs has 12 customers as of October 2015, and is working on how to create sockets more quickly--a current bottleneck.
SANIWOOD	India	A sanitation and menstrual hygiene distribution and training service in rural India
SEED JARNA Pump	India	Lightweight, portable and fuel-efficient diesel irrigation pump
SMART Box	India	The Sanitary MAterials and Resources Tool Box, SMART Box, is a simple, handy organizational tool for wound treatment equipment and supplies that reduces the risk of contamination, while facilitating health worker's productivity. This device strives to help healthcare providers limit their movement during wound treatment procedures, which reduces contamination, while providing a convenient and easy to use system tailor made to their work flow.
Stay Pink (Anemia prevention)	India	A system for the iron fortification of drinking water in homes with an iron dispensing component which releases the required amount or iron for fortification and a siphon system which allows to control the time a fixed volume of water is exposed to the dispenser.
Sukh (Delivery and Care for Diabetics)	India	'Sukh' is a home-based care, medication and diagnosis delivery system that is aimed at elderly diabetic patients, including a backpack for service providers with built-in cold storage.
Thalir (Nutrition-Monitoring and Educational Tool)	India	A novel diagnostic tool with educational modalities developed to innovate in the malnutrition space. Standardization of the diagnosis process, automated record keeping, integration of qualitative and quantitative diagnostic methods, lasting education of community members and promotion of local treatments were prioritized.
Zimba	India	Automatic, gravity-fed chrlorine doser that attaches to borewell handpumps to safely disinfect drinking water in communities wtihout regular access to treated municipal water

Name of Solution	Focal Country	Description
Solar powered refrigeration-evaporatively cooled structures for smallholder farms.	India	Our technology helps the farmers to store their fruits and vegetables and increase the life of the produce from harvest to sale. In countries like India where the temperatures are high, the farmers face problems of wastage of produce after harvest as there is no technology to store the produce in a cool place. The evaporative cooled storage structure will be a low cost storage unit that has been redesigned so that it can be built at minimal cost to the farmer or farmer group. The evaporative cool room is being designed so that it can be converted to an efficient, solar-powered refrigerated storage at minimal additional cost should additional capital be available.
Operation ASHA	India	Works to prevent and treat tuberculosis with the ultimate goal of eliminating TB among disadvantaged communities by utilizing SMS and biometric technology to ensure treatment adherence.
Arogya Finance	India	Health Loans for the Traditionally Unbankable. Provides health loans within 24 hours to patients, approving patients based on a proprietary behavioral test rather than formal system requirements like a bank account or collateral.
Forus Health	India	Intelligent Medical Technology. Focused on "Democratizing Wellness," Forus Health develops affordable technology solutions that can easily be used by a minimally trained technician, thereby making health service accessible and scalable. Creator of 3nethra- an intelligent pre-screening ophthalmology device.
SughaVazhvu	India	Evidence Based Blue Print for Primary Care. Offers low-cost primary healthcare services through an easy to follow blue print clinic system. This includes a focus on evidence-based primary care, use of a proprietary health management information system, community engagement tactics and highly developed protocols to treat the most common 80+ illnesses.
Swasth	India	Low Cost, Patient Centered, Primary Care Franchise. Driven by the motto "Health for all," Swasth India operates a chain of primary care centers in slum areas with a model that provides a 50% reduction in out of pocket expenses to the patient. Provides everything in a 150 square foot facility that offers access to a family doctor, rapid diagnostics on site, discounts on drugs, referrals with discounts, in patient day care services and electronic health records.
Vaatsalya	India	Builds and manages hospitals/clinics in semi-urban and rural areas of India to bring healthcare services where they are most needed.
ClickMedix	India	Brings affordable and quality health services to underserved populations by connecting patients to doctors through mobile technologies and community-based health providers to achieve continuous healthcare delivery to patients.

Name of Solution	Focal Country	Description
We Care Solar	India	Promotes safe motherhood and reduces maternal mortality in developing regions by providing health workers with reliable lighting, mobile communication, and blood bank refrigeration using solar electricity.
Sproxil	India	Provides world-class brand protection services in emerging markets by allowing consumers to verify product genuineness within seconds through SMS texts.
Ayzh	India	This innovator is part of the third SEAD cohort. Develops low-cost, appropriate technology such as safe birthing kits designed to meet the needs of women in resource-poor settings.
Bodhi Health	India	This innovator is part of the third SEAD cohort. Provides medical education training materials that explain complex medical topics to less literate health workers with highly pictorial e-Learning content available in regional languages.
Noora Health	India	This innovator is part of the third SEAD cohort. Provides training that empowers families of patients to be better care givers in the hospital and at home. Noora operates in India and US.
SevaMob	India	This innovator is part of the third SEAD cohort. Offers primary healthcare and insurance via mobile clinics. It offers rapid point-of-care diagnostics and provides healthcare sponsorships for orphanages.
India NGO Crowdsourcing tool	India	Building on the User Contributed features, this innovation pilot will support an ARC research project to contact 53,000 NGOs in India to provide feedback on AidData geocoded projects in India (World Bank)
Affordable Recycled Modular Roofs	India	Classifying and analyzing material properties of modular roofing tile with UC Berkeley and LBNL experts in order to optimize design
Digital Mapping for Transparency	India	Working to get acess to satellite images; finalizing the exact location to pilot
Digital Mapping for Transparency: Mapping	India	Help quantify slum types using imagery
Does Scarcity Improve Adoption	India	Design of lab experiment and running pilots as well as analyzing the first pilot data and running new pilots in India.
Electrochemical Arsenic Remediation (ECAR)	India	Large-scale ECAR demonstration in India
Electrochemical Arsenic Remediation Explore Project	India	Water treatment technology (to remove arsenic and microbes from groundwater) Uses iron electrocoagulation to produce iron precitates with a high affinity for arsenic and microbes, that are subsequently removed by settling

Name of Solution	Focal Country	Description
Energy Efficiency and Rural Electrification	India	Selecting sites for energy efficiency study, developing protocols for intervention delivery
Fluroide Remediation	India	Development of Aluminum Electrocoagulation for defluoridation in UCB labs
Improving job search efficiency	India	Planning for data collection and expand access to web portal
Information and Intermittent Water	India	Crowd-sourced data on water intermittency; evaluating efforts of Nextdrop to collect and send household notifications based on this data rather than collecting this data ourselves
Mezuri Portland State University: SweetSense	India	Remotely reporting motion detectors in latrines
Mezuri Technology and Infrastructure for Emerging Regions (TIER)	India	Under active development: prototype end-to-end data collection, storage, processing, analysis, visualization, and sharing platform.
Mezuri U of Washington	India	ODK Survey is being piloted in Ghana and India with PATH to develop a mHealth that includes a digitized WHO's Integrated Management of Childhood Illness (IMCI) protocol and USB pulse-ox
Modular Roofs Drying Method	India	Low energy drying method for ModRoof tile manufacturing
Modular Roofs Water Proofing Method	India	Novel low cost methods of waterproofing between ModRoofs tiles
Reducing Corruption Through Crowdsourcing	India	Development and eventual pilot an application to anonymously crowdsource information on the performance of Indian government offices, with the goal of improving the overall quality of service delivery.
Remote Monitoring of Gov't Service Providers	India	Building customized call center for scalable real-time push and pull communcation with project participants
Rural Electric Power Project (REPP)	India	Evaluate interventions related to grid expansion, billing and theft deterrence.
Scaling of Peer Education	India	Impact evaluation of Khedut Saathi voice-based mobile surveys to understand how to scale up peer education among smal-scale Indian farmers
Sustainable Arsenic-Bearing Sludge Management	India	1. Productive and Sustainable Arsenic-Bearing Sludge Management. 2. Embedding Alum based Arsenic-bearing ECAR sludge in Concrete used in Indian environment. 3. Analysis (IS / EPA standard followed) of Leachate generated from alum-based arsenic-bearing ECAR sludge embedded in concrete
Treating Brackish Drinking Water	India	Affordable (IER) electrode fabrication

Name of Solution	Focal Country	Description
Treating Brackish Drinking Water Manufacture Approach	India	Method for improving manufacture (e.g. reducing IER bead size, method for coating surfaces/deposition, plasma carbon coating method, bulk electrode,)
Affordable Recycled Modular Roofs	India	1. A modular water-proof roofing tile and modular roofing system made of recycled compressed cardboard and a proprietary coating. 2. A "green" additive for ModRoof tiles that adds water resistence to the core. 3. Low energy drying method for ModRoof tile manufacturing cardboard based material, even when the water proof coating is compromised. 4. Novel low cost methods of waterproofing between ModRoofs tiles. 5. An low cost antimicrobial additive.
Electrochemical Arsenic Remediation (ECAR)	India	A highly effective method to remove arsenic from real groundwater at a locally affordable cost using ECAR. The team continues to itereate ECAR prototype design based on solving technical challenges that are apparent only at larger scales and long term operation, as well as identified opportunities for cost savings.
Electrochemical Arsenic Remediation (ECAR) Brush	India	ECAR special brush and maintenance plan to extend the life and performance of ECAR electrodes
Electrochemical Arsenic Remediation (ECAR)	India	1. A highly effective method to remove arsenic from real groundwater at a locally affordable cost using ECAR. The team continues to itereate ECAR prototype design based on solving technical challenges that are apparent only at larger scales and long term operation, as well as identified opportunities for cost savings. 2. ECAR special brush and maintenance plan to extend the life and performance of ECAR electrodes
Electrochemical Arsenic Remediation (ECAR): Data logger	India	ECAR data logger to record and log voltages on ECAR electrodes for ECAR systems to assess performance and potentially send performance to engineers via the cell network to reduce down time
Information and Intermittant Water	India	Evaluating a text message based system for notification regarding water arrival times to help households cope with intermittency.
Mobile Phone-based Pulse Oximeter	India	mobile phone-based pulse oximeter
Affordable Recycled Modular Roofs Water Resistent Additive	India	A "green" additive for ModRoof tiles that adds water resistence to the core cardboard based material, even when the water proof coating is compromised
Motion detection for latrines (PSU - Mezuri)	India	Remotely reporting motion detectors in latrines
Reducing Corruption Through Crowdsourcing	India	Evaluating the Impact of crowdsourcing application that aggregates info about corruption and public service delivery.

Name of Solution	Focal Country	Description
Sustainable Arsenic Bearing Sludge Management Concrete Product	India	Embedding Alum based Arsenic-bearing ECAR sludge in Concrete used in Indian environment and Analysis (IS / EPA standard followed) of Leachate generated from alum-based arsenic-bearing ECAR sludge embedded in concrete
Sustainable Arsenic Bearing Sludge Management Technique	India	Productive and Sustainable Arsenic-Bearing Sludge Management
Treating Brackish Drinking Water	India	1. Creation of a uniquely designed CDI prototype capable of operating in traditional mode and now in pulse-charged mode. 2. Method for reducing IER bead size; Optimization of bead sizes; Selection of milling techonology. 3. Developing a method for coating surfaces of IERs with carbon, via pyrolyis or other methods; Simple deposition methods; Plasma carbon coating method; Analytical characterization of plasma-derived carbon. 4. eveloping a method for froming an electrode bulk material; Optimization of forming bulk electrode; Identifying suitable components; Build a CDI prototype to test inks; Test perfomance of our electrodes in prototype.
Treating Brackish Drinking Water CDI Prototype	India	Creation of a uniquely designed CDI prototype capable of operating in traditional mode (with the goal of being operable in pulsed mode as that develops)
Somatic Embryogenesis	Indonesia	Piloting method to evaluate new biotechnologies in the cacoa sector
Somatic Embryogensis	Indonesia	Used research results to inform their development activities in Sulawesi Tenggara
Village Base Station (VBTS): Community Cellular Network	Indonesia	Community Cellular Network
Village Base Station: Commcercialization	Indonesia	Endaga directly commercializing VBTS research
Village Base Station (VBTS)	Indonesia	The CCN (formerly VBTS) project has produced a novel, low-cost/low-power base station which provides cellular coverage in rural areas.
We Care Solar	Japan	Promotes safe motherhood and reduces maternal mortality in developing regions by providing health workers with reliable lighting, mobile communication, and blood bank refrigeration using solar electricity.
Ayzh	Laos	This innovator is part of the third SEAD cohort. Develops low-cost, appropriate technology such as safe birthing kits designed to meet the needs of women in resource-poor settings.

Name of Solution	Focal Country	Description
Weather-Resistant Bamboo Shingles (ABARI)	Nepal	A bamboo-sap displacement machine to create weather-resistant and eco-friendly bamboo shingles in Nepal
Practice, strategy and policy framework	Nepal	The research is examining the effectiveness of Gravity Good Ropeway (GGR) in market linkage and addressing food insecurity of small holder farmers. First, research investigates how GGR is under practice in rural hilly region of Nepal. Then it looks in to the technological process followed to install GGR and its role in market linkage and enhancing food security among small holder farmers. Adjoining this, the research also inspect the strategies to make GGR socially accepted by the beneficiaries. After microscopic view of practice, process and strategies, the research will finally suggest appropriate policy framework essential for the successful operation of the GGR in Nepal including other mountainous countries in the world.
We Care Solar	Nepal	Promotes safe motherhood and reduces maternal mortality in developing regions by providing health workers with reliable lighting, mobile communication, and blood bank refrigeration using solar electricity.
Aid Management Platform GIS Module	Nepal	Re-engineered portions of the Aid Management Platform (including cost share from EU). Focus areas are GIS, API, Dashboards, Reports, and Public Portal.
AidData Geocoding Methodology	Nepal	The AidData geocoding methodology provides a standardized methodology for spatially tagging the locations of aid projects. This methodology is used by AidData under the HESN award to geocode the aid management stystems of our partner countries.
Emergency Response Solar Suitcases: Nepal Earthquake	Nepal	We Care Solar Suitcase Program
WE CARE Solar	Nepal	Piloting We Care Solar Suitcase progran in Tanzania, Nepal, Philippines, Ethiopia
FarmerLink early warning system	Philippines	We envision the early warning system (EWS) to use on-the-ground data from our field officers, satellite images, weather information and crop models to come out with messages to warn farmers against extreme weather events and potential pest and disease outbreaks. The EWS will give out messages and actionable information directly to farmers via text or voice messages but at the same time provide reports and dashboards to government agencies and private sector partners so they can detect potential outbreaks in specific geographical areas and send out appropriate quick response teams for pest management and control.

Name of Solution	Focal Country	Description
Our mobile-enabled solution combines mobile tools and technology with last-mile field extension officers to provide smallholder farmers with information on updated agriculture practices, potential pest and disease outbreaks and product standards so farmers will have improved direct access to markets.	Philippines	We combine the reach of mobile technology with the effectiveness of trusted last-mile agents to facilitate two-way information flows that enable transactions and more inclusive value chains.
ClickMedix	Philippines	Brings affordable and quality health services to underserved populations by connecting patients to doctors through mobile technologies and community-based health providers to achieve continuous healthcare delivery to patients.
We Care Solar	Philippines	Promotes safe motherhood and reduces maternal mortality in developing regions by providing health workers with reliable lighting, mobile communication, and blood bank refrigeration using solar electricity.
AidData Geocoding Methodology	Philippines	The AidData geocoding methodology provides a standardized methodology for spatially tagging the locations of aid projects. This methodology is used by AidData under the HESN award to geocode the aid management stystems of our partner countries.
National Economic Development Authority (NEDA) GIS Platform	Philippines	AidData is developing a new GIS platform, to be integrated with the National Economic Development Authority's Programs and Projects Information Exchange System (PPIES). The tool will allow NEDA to quickly run basic GIS analyses to examine funding patterns and identify potential funding gaps.
Emergency Response Solar Suitcases: Philippines Typhoon	Philippines	Emergency Response Solar Suitcases
Empowering Homegrown Environmental Monitors	Philippines	Designing an ICT monitoring system to connect grassroots community monitors to government authorities and the public
Lowering Barriers Technology	Philippines	Using the extent of SMS referrals to measure village social networks
WE CARE Solar	Philippines	Piloting We Care Solar Suitcase progran in Tanzania, Nepal, Philippines, Ethiopia
GSM White Spaces technology (VBTS Team)	Philippines	GSM White Spaces technology, a mechanism for discovering fallow channels in the GSM band.
Village Base Station (VBTS)	Philippines	The CCN (formerly VBTS) project has produced a novel, low-cost/low-power base station which provides cellular coverage in rural areas. THis is an adaptation for Philippines users

Name of Solution	Focal Country	Description
Global Story Project	Sri Lanka	The Global Story Project will collaborate with communities in low-resource settings to create a social venture. The Project will document oral lessons and stories from the communities to create a digital library of compelling and culturally important content. Through the sale of greeting cards and products that are 'inspired by the human spirit' in the US, the project will support community-building initiatives and cultural preservation projects.
ClickMedix	Taiwan	Brings affordable and quality health services to underserved populations by connecting patients to doctors through mobile technologies and community-based health providers to achieve continuous healthcare delivery to patients.
Ocular Cellscope	Thailand	We have developed a novel compact optical system for imaging the retina and a novel approach for integrating fixation lights into this imaging system
Second Chance Vietnam	Vietnam	The secondhand goods industry has grown rapidly in recent years in Vietnam due to the economic slowdown and young consumers' increased environmental awareness. However, this market has been in disarray with many small disorganized shops selling low quality goods from unclear sources, resulting in low consumer trust. Second Chance Vietnam (aka Siêu Thị Xanh) is a high-end consignment store where consignors sell their good quality used goods including apparel, furniture, kitchenware, and children's merchandise for a profit. Green Second Chance's objective is to ensure the origin and quality of the goods, as well as provide excellent customer service. This venture provides triple bottom line impact by income generation, encouraging recycling and reuse, and empowering poor and at-risk youth through education, training and employment opportunities.
Cassava simulation model	Vietnam	A model capable of simulating growth for given management and weather inputs, that allows optimizing agronomy at field-scale.
We Care Solar	Vietnam	Promotes safe motherhood and reduces maternal mortality in developing regions by providing health workers with reliable lighting, mobile communication, and blood bank refrigeration using solar electricity.
Automated smear-positive tuberculosis diagnosis	Vietnam	CellScope hardware and software is being developed as well as automated imaging and analysis platform.
The Southeast Asia - Renewable and Adaptive Energy (SEA RAE) Demonstrating solar PV minigrid	Vietnam	Demonstrating solar PV minigrid
The Southeast Asia - Renewable and Adaptive Energy (SEA RAE) Project	Vietnam	Novel algorithm to optimize user demand to predicted solar resource

Name of Solution	Focal Country	Description
Cellscope TB	Vietnam	CellScope hardware and software tools being developed; Stored sputum smears being analyzed using next-gen hardware and software; Field evauation in Hanoi, Vietnam
Cellscope-Tuberculosis	Vietnam	CellScope hardware and software tools under development; Accuracy Validation of next-generation hardware and software though analysis of stored sputum smears; Field evaluation in Hanoi, Vietnam

Table 2: HESN Outputs in Asia 2012-2016

HESN Lab	Output Type	Name of Output
International Development Innovation Network	Hub	Peace Innovation Lab
International Development Innovation Network	Workshop/Training/Capacity Building	Design Educators in Development - A Mindful Practice
International Development Innovation Network	Knowledge Sharing or Collaborative Platform	India IDIN Local Chapter
International Development Innovation Network	Workshop/Training/Capacity Building	CCB Training-of-Trainers in the Philippines
International Development Innovation Network	Workshop/Training/Capacity Building	Faculty Workshop in Singapore
International Development Innovation Network	Workshop/Training/Capacity Building	Build-It: Metal-Only Hand-Held Foam Cutter (Ahmedabad)
International Development Innovation Network	Publication or Report	Student Presentation (MIT): SEED Jarna Pump
International Development Innovation Network	Major Event	IDDS Aarogyam
International Development Innovation Network	Other	Project-Based Engineering Education: Talk at B.S. Abdur Rahman University
International Development Innovation Network	Publication or Report	IDDS Aarogyam Report: Nutrition Monitoring and Education Tool Project Report
International Development Innovation Network	Publication or Report	IDDS Aarogyam Report: Rural Delivery Pack and Care for Diabetics Project Report
International Development Innovation Network	Publication or Report	IDDS Aarogyam Report: S.M.A.R.T. Box for Sanitation Project Report
International Development Innovation Network	Publication or Report	IDDS Aarogyam Report: Neonatal Resusitation Device Project Report
International Development Innovation Network	Publication or Report	IDDS Aarogyam Report: Safety Harness Vest Project Report

HESN Lab	Output Type	Name of Output
International Development Innovation Network	Publication or Report	IDDS Aarogyam Report: Iron Supplementation Device Project Report
International Development Innovation Network	Publication or Report	IDDS Aarogyam Report: Birth Spacing Decision Wheel Project Report
International Development Innovation Network	Publication or Report	IDDS Aarogyam Report: TempIT Baby Thermometer Project Report
International Development Innovation Network	Publication or Report	IDIN Summer Research Fellow Report: Nepal Earthquake 2015: Field Research in the Earthquake's Epicenter
International Development Innovation Network	Publication or Report	IDIN Summer Research Fellow Report: IDIN Research Report Myanmar
International Development Innovation Network	Publication or Report	IDIN Summer Research Fellow Report: Pakistan Final Report
International Development Innovation Network	Hub	Make-i-Stan
International Development Innovation Network	Hub	Project DEFY Banjarapalya Makerspace
International Development Innovation Network	Hub	Rural Technology Lab
International Development Innovation Network	Major Event	IDDS Lahore
International Development Innovation Network	Major Event	9th Annual Seoul Official Development Assistance Conference
International Development Innovation Network	Publication or Report	Field trial of an automated batch chlorinator system at shared water points in an urban community of Dhaka, Bangladesh
International Development Innovation Network	Publication or Report	IDDS Lahore Project Report: Hello Teacher
International Development Innovation Network	Publication or Report	IDDS Lahore Project Report: Milk-e-Way
International Development Innovation Network	Publication or Report	IDDS Lahore Project Report: Rah-e-Maa

HESN Lab	Output Type	Name of Output
International Development Innovation Network	Publication or Report	IDDS Lahore Project Report: Asan Rasta
International Development Innovation Network	Publication or Report	IDDS Lahore Project Report: WeSMS
International Development Innovation Network	Publication or Report	IDDS Lahore Project Report: ASAP
International Development Innovation Network	Workshop/Training/Capacity Building	CCB Training in Indonesia
International Development Innovation Network	Workshop/Training/Capacity Building	Co-Created Design + Rapid Prototyping Workshop (Mar 2016)
Development Impact Lab	Data-Related Analysis/Mapping/Consultation	Electrochemical Arsenic Remediation (ECAR) - Survey analysis
Development Impact Lab	Data-Related Analysis/Mapping/Consultation	Village Base Station (VBTS) - Field Surveys
Development Impact Lab	Data-Related Analysis/Mapping/Consultation	ElectroChemical Arsenic Remediation Survey Data Analysis
Development Impact Lab	Data-Related Analysis/Mapping/Consultation	ElectroChemical Arsenic Remediation Models
Development Impact Lab	Data-Related Tool	Empowering Homegrown Environmental Monitors
Development Impact Lab	Dataset	Energy Efficiency - Household Baseline Survey Data
Development Impact Lab	Dataset	Energy Efficiency - Admin Data on Billing and Payments
Development Impact Lab	Dataset	Improving Job Search Efficiency - Database of Job Seekers
Development Impact Lab	Publication or Report	Improving Job Search Efficiency - Summary Report from Baseline
Development Impact Lab	Publication or Report	Improving Job Search Efficiency - Policy Brief
Development Impact Lab	Publication or Report	Improving Job Search Efficiency - Publication
Development Impact Lab	Data-Related Approach	Digital Mapping for Transparency
Development Impact Lab	Data-Related Best Practice	Bombay Real Air-Time Sensors

HESN Lab	Output Type	Name of Output
Development Impact Lab	Evaluation	Ocular Cellscope - Prototype Evaluation
Development Impact Lab	Data-Related Technology	Bombay Real Air-Time Sensors
Development Impact Lab	Data-Related Tool	Village Base Station (VBTS) - Survey Design
Development Impact Lab	Data-Related Tool	Village Base Station (VBTS) - Survey Design
Development Impact Lab	Dataset	Affordable Recycled Modular Roofs Dataset
Development Impact Lab	Publication or Report	ECAR publication
Development Impact Lab	Knowledge Sharing or Collaborative Platform	Ocular Cellscope Platform
Development Impact Lab	Dataset	SEA RAE Dataset
Development Impact Lab	Dataset	Somatic Embryogensis Dataset
Development Impact Lab	Data-Related Tool	Remote Monitoring of Competition Tool
Development Impact Lab	Data-Related Tool	Village Base Station (Tool)
Development Impact Lab	Dataset	Modular Roofs - Strength Properties data
Development Impact Lab	Dataset	Modular Roofs - Data from Evaluation of Roofs installed
Development Impact Lab	Dataset	Electrochemical Arsenic Remediation (ECAR) - ECAR Demo Data
Development Impact Lab	Dataset	Electrochemical Arsenic Remediation (ECAR) - Survey Data
Development Impact Lab	Dataset	Rural Electric Power Project (REPP) - Dataset: India Energy Consumption
Development Impact Lab	Dataset	Sustainable Arsenic Bearing Sludge Management - Dataset: Physical Characterization of Alum based Arsenic bearing ECAR sludge
Development Impact Lab	Dataset	Sustainable Arsenic Bearing Sludge Management - Dataset: Chemical Characterization of Alum based Arsenic-bearing ECAR sludge
Development Impact Lab	Dataset	Improving Job Search Efficiency Dataset of Job Seekers
Development Impact Lab	Dataset	Improving Job Search Efficiency Midline Data Collection
Development Impact Lab	Dataset	Bombay Real Air-Time Sensors Historical Data from Indian Gov't SAFR sensors
Development Impact Lab	Dataset	Bombay Real Air-Time Sensors Historical Data from Sensors

HESN Lab	Output Type	Name of Output
Development Impact Lab	Dataset	Rural Electric Power Project: Data collection on energy consumption
Development Impact Lab	Dataset	Rural Electric Power Project (REPP) - Dataset: India Energy Consumption 2
Development Impact Lab	Dataset	Treating Brackish Water - Dataset CDI Prototype Performance
Development Impact Lab	Evaluation	Electrochemical Arsenic Remediation (ECAR) - Evaluation of demo
Development Impact Lab	Evaluation	Modular Roofs - Evaluation of Roofs installed
Development Impact Lab	Evaluation	Scaling of Peer Education - Impact Evaluation
Development Impact Lab	Evaluation	Scaling of Peer Education Impact Evaluation
Development Impact Lab	Evaluation	REPP: Planned Evaluation related to grid expansion, billing and theft deterrence.
Development Impact Lab	Publication or Report	Affordable Recycled Modular Roofs
Development Impact Lab	Publication or Report	Dev Eng Journal Article: Radio frequency (un)identification
Development Impact Lab	Publication or Report	Dev Eng Journal Article: The pursuit of balance in sequential randomized trials
Development Impact Lab	Other	Electrochemical Arsenic Remediation (ECAR) - Sludge Management Best Practice
Development Impact Lab	Other	Modular Roofs - Business Model
Development Impact Lab	Other	Collective assessment and feedback engine (CAFE) - Joint Proposal
Development Impact Lab	Publication or Report	Improving Job Search Efficiency Project Summary
Development Impact Lab	Publication or Report	Electrochemical Arsenic Remediation (ECAR) - Manuscript Survey Data
Development Impact Lab	Publication or Report	ElectroChemical Arsenic Remediation (ECAR) Ongoing Manuscript
Development Impact Lab	Publication or Report	REPP Report on Solar MicroGrid Sites
Development Impact Lab	Publication or Report	Modular Roofs - Manuscript for Development Engineering Journal
Development Impact Lab	Publication or Report	Digital Mapping for Transparency - Publication
Development Impact Lab	Publication or Report	Treating Brackish Drinking Water Paper
Development Impact Lab	Workshop/Training/Capacity Building	Affordable Recycled Modular Roofs Presentation to IndoUS Science & Tech Forum
Development Impact Lab	Publication or Report	Portland State University / Mezuri Team - Publication: Sensor Use in Latrines

HESN Lab	Output Type	Name of Output
Development Impact Lab	Workshop/Training/Capacity Building	Electrochemical Arsenic Remediation (ECAR)
Development Impact Lab	Workshop/Training/Capacity Building	Intermittent Water - GPS Training for survey Team
Development Impact Lab	Workshop/Training/Capacity Building	Information and Intermittent Water
Development Impact Lab	Workshop/Training/Capacity Building	ECAR: Local Capacity Building
Global Center for Food Systems Innovation	Evaluation	Request for Applications (RFA) Analysis and Data Gathering
Global Center for Food Systems Innovation	Major Event	Attended the Energy Resources Institute (TERI) symposium, Food Systems Innovation in the Southeast Asia Region
Social Entrepreneurship Accelerator at Duke	Major Event	Future of Healthcare Conference
Social Entrepreneurship Accelerator at Duke	Major Event	Health Innovation Discussion
Social Entrepreneurship Accelerator at Duke	Major Event	World Innovation Summit for Health
Social Entrepreneurship Accelerator at Duke	Workshop/Training/Capacity Building	Strategy & New Product Development Workshop with Forus Health
Social Entrepreneurship Accelerator at Duke	Workshop/Training/Capacity Building	Impact Evaluation Workshop with ayzh
Social Entrepreneurship Accelerator at Duke	Workshop/Training/Capacity Building	Service Integration & Impact Evaluation Workshop with Sughvazhvu
Social Entrepreneurship Accelerator at Duke	Workshop/Training/Capacity Building	Organizational Fundraising Workshop with Swasth
Social Entrepreneurship Accelerator at Duke	Workshop/Training/Capacity Building	Impact Evaluation Workshop with SevaMob
Social Entrepreneurship Accelerator at Duke	Workshop/Training/Capacity Building	Ecosystem Mapping Workshop with Bodhi Health

HESN Lab	Output Type	Name of Output
Social Entrepreneurship Accelerator at Duke	Knowledge Sharing or Collaborative Platform	Medtronic/Innovations in Healthcare Roundtable
Social Entrepreneurship Accelerator at Duke	Evaluation	DGHI Evidence Lab Economic Impact Tool (ayzh)
Social Entrepreneurship Accelerator at Duke	Evaluation	DGHI Evidence Lab Economic Impact Tool (Noora Health)
Social Entrepreneurship Accelerator at Duke	Evaluation	DGHI Evidence Lab Patient Level Impact Tool (SughaVazvhu)
Social Entrepreneurship Accelerator at Duke	Evaluation	DGHI Evidence Lab Organizational Influence Tool (Operation ASHA)
Social Entrepreneurship Accelerator at Duke	Evaluation	DGHI Evidence Lab Organizational Influence Tool (Noora Health)
Center on Conflict and Development	Publication or Report	"Ethical Challenges in Advanced Human Capacity" Lecture in Qatar
Center on Conflict and Development	Publication or Report	Ethical Challenges in Advanced Human Capacity Presentation
Center on Conflict and Development	Other	MOUs
AidData Center for Development Policy	Data-Related Technology	Aid Management Platform GIS Module
AidData Center for Development Policy	Dataset	Bangladesh Select Donors Level 1 Geocoded Research Release v 1.0
AidData Center for Development Policy	Dataset	Bangladesh Select Donors Level 1 Geocoded Research Release v 1.1
AidData Center for Development Policy	Data-Related Technology	Nepal Public Portal
AidData Center for Development Policy	Data-Related Technology	India NGO Crowdsourcing Tool
AidData Center for Development Policy	Data-Related Technology	National Economic Development Authority (NEDA) GIS Platform

HESN Lab	Output Type	Name of Output
AidData Center for Development Policy	Dataset	Nepal Aid Management Platform 1.0 International Aid Transparency Initiative Research Release
AidData Center for Development Policy	Dataset	Nepal Aid Management Platform 1.0 Research Release
AidData Center for Development Policy	Dataset	Nepal Level 1 Aid Management Platform Geocoded Research Release v 1.1
AidData Center for Development Policy	Dataset	Nepal Level 1 Aid Management Platform Geocoded Research Release v 1.2
AidData Center for Development Policy	Dataset	Nepal Level 1 Aid Management Platform Geocoded Research Release v 1.3
AidData Center for Development Policy	Dataset	Nepal Level 1 Aid Management Platform Geocoded Research Release v 1.4
AidData Center for Development Policy	Major Event	Open Data Working Group
AidData Center for Development Policy	Dataset	Nepal Aid Management Platform Geocoded Dataset (alpha)
AidData Center for Development Policy	Data-Related Approach	AidData Geocoding Methodology
AidData Center for Development Policy	Data-Related Approach	AidData Geocoding Methodology
Comprehensive Initiative on Technology Evaluation	Evaluation	Educational technologies evaluation
Comprehensive Initiative on Technology Evaluation	Publication or Report	Rainwater Harvesting
Comprehensive Initiative on Technology Evaluation	Evaluation	Water Filter Evaluation
Comprehensive Initiative on Technology Evaluation	Publication or Report	Water filter evaluation report
Comprehensive Initiative on Technology Evaluation	Evaluation	Water filter evaluation

HESN Lab	Output Type	Name of Output
Comprehensive Initiative on Technology Evaluation	Dataset	Water filter dataset
Comprehensive Initiative on Technology Evaluation	Publication or Report	Working paper on water filter scalability evaluation results
Comprehensive Initiative on Technology Evaluation	Publication or Report	Working paper on the business model for the Dolphin water filter supply chain
Comprehensive Initiative on Technology Evaluation	Publication or Report	Evaluation of microbial water quality tests for humanitarian emergency and development settings
Comprehensive Initiative on Technology Evaluation	Publication or Report	Real World Research in Product Evaluation and Sustainable Development to Reach Scale
Comprehensive Initiative on Technology Evaluation	Evaluation	Water Test Kit Evaluation
Comprehensive Initiative on Technology Evaluation	Major Event	Meet-and-Greet Event at IIT
Comprehensive Initiative on Technology Evaluation	Major Event	Meet-and-Greet Event at IIM-AMD
Comprehensive Initiative on Technology Evaluation	Major Event	Meet-and-Greet Event at Ahmedabad University
Comprehensive Initiative on Technology Evaluation	Major Event	A Panel Presentation and Discussion of Water Filters & Quality in Ahmedabad
Comprehensive Initiative on Technology Evaluation	Major Event	Lunch & Learn with Susan Murcott: Household Water Filter Evaluation in Ahmedabad, India
Comprehensive Initiative on Technology Evaluation	Major Event	Water and Health 2015: Where Science Meets Policy
Comprehensive Initiative on Technology Evaluation	Major Event	CITE-SEWA Roundtable on Consumer-Led Technology Evaluation
Comprehensive Initiative on Technology Evaluation	Publication or Report	Household Water Filter Evaluation — Suitability, India
Comprehensive Initiative on Technology Evaluation	Publication or Report	Water Quality Testing by Source in Ahmedabad, India: Results and Maps

HESN Lab	Output Type	Name of Output
Comprehensive Initiative on Technology Evaluation	Publication or Report	Household Water Filter Evaluation — Scalability
Comprehensive Initiative on Technology Evaluation	Publication or Report	Household Water Filter Evaluation — Sustainability
Comprehensive Initiative on Technology Evaluation	Evaluation	Solar Water Pumps Evaluation
Comprehensive Initiative on Technology Evaluation	Evaluation	Solar Water Pumps Evaluation
Comprehensive Initiative on Technology Evaluation	Evaluation	Evaluation of Wheelchairs