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IMPLEMENTATION COMPLETION AND RESULTS REPORT

IDA 45440-BN and IDA 53320-BN

ON A

CREDIT

IN THE AMOUNT OF SDR 135.9 MILLION

AND

US\$205.8 MILLION EQUIVALENT

TO THE

PEOPLE'S REPUBLIC OF BANGLADESH

FOR THE

BANGLADESH - HIGHER EDUCATION QUALITY ENHANCEMENT PROJECT (P106216)

June 21, 2019

Education Global Practice
South Asia Region

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CURRENCY EQUIVALENTS
(Exchange Rate Effective May 1, 2019)

Currency Unit = Bangladeshi Taka (BDT)

BDT 84.385 = US\$1

US\$1.383 = SDR 1

FISCAL YEAR
July 1 - June 30

ABBREVIATIONS AND ACRONYMS

ACB	Accreditation Council Bangladesh
AIF	Academic Innovation Fund
BAC	Bangladesh Accreditation Council
BdREN	Bangladesh Research and Education Network
CAS	Country Assistance Strategy
CPF	Country Partnership Framework
EIRR	Economic Internal Rate of Return
EOP	End of Project
FabLab	Fabrication Laboratory
FM	Financial Management
GDP	Gross Domestic Product
GoB	Government of Bangladesh
HE	Higher Education
HEAT	Higher Education Acceleration and Transformation Project
HEMIS	Higher Education Management Information System
HEQEP	Higher Education Quality Enhancement Project
HEQEPU	Higher Education Quality Enhancement Project Unit
ICR	Implementation Completion and Results Report
ICT	Information and Communications Technology
IPF	Investment Project Financing
ISR	Implementation Status and Results Report
IQAC	Institutional Quality Assurance Cell
IRR	Internal Rate of Return
M&E	Monitoring and Evaluation
MEU	Monitoring and Evaluation Unit
MoE	Ministry of Education
MTBF	Medium-Term Budgetary Framework
MTR	Midterm Review
OM	Operations Manual
PCR	Project Completion Report
PDO	Project Development Objective
PMIS	Project Management Information System

PRSP	Poverty Reduction Strategy Paper
QA	Quality Assurance
QAAC	Quality Assurance and Accreditation Council of Bangladesh
QAU	Quality Assurance Unit
SAC	Self-assessment Committee
SAR	Self-assessment Report
UGC	University Grants Commission

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P106216	Bangladesh - Higher Education Quality Enhancement Project
Country	Financing Instrument
Bangladesh	Investment Project Financing
Original EA Category	Revised EA Category
Partial Assessment (B)	Partial Assessment (B)

Organizations

Borrower	Implementing Agency
People's Republic of Bangladesh	Ministry of Education, University Grants Commission

Project Development Objective (PDO)

Original PDO

The main objective of the project is to improve the quality and relevance of the teaching and research environment in higher education institutions through encouraging both innovation and accountability within universities and by enhancing the technical and institutional capacity of the higher education sector.



FINANCING

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
World Bank Financing			
IDA-45440	81,000,000	80,812,964	82,861,705
IDA-53320	125,000,000	125,000,000	113,564,828
Total	206,000,000	205,812,964	196,426,533
Non-World Bank Financing			
Borrower/Recipient	10,500,000	21,300,000	20,400,000
Total	10,500,000	21,300,000	20,400,000
Total Project Cost	216,500,000	227,112,964	216,826,533

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
17-Mar-2009	13-May-2009	08-Jan-2012	31-Dec-2013	31-Dec-2018

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US\$M)	Key Revisions
10-Jan-2013	54.49	Change in Results Framework Change in Loan Closing Date(s) Reallocation between Disbursement Categories
03-Nov-2013	76.02	Reallocation between Disbursement Categories
03-Dec-2013	76.02	Additional Financing

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

**RATINGS OF PROJECT PERFORMANCE IN ISRs**

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	24-Jun-2009	Satisfactory	Satisfactory	0
02	23-Dec-2009	Moderately Satisfactory	Moderately Satisfactory	2.15
03	23-Jun-2010	Satisfactory	Moderately Satisfactory	3.69
04	01-Jan-2011	Satisfactory	Moderately Satisfactory	8.12
05	18-Jul-2011	Moderately Satisfactory	Moderately Satisfactory	15.86
06	23-Jan-2012	Moderately Satisfactory	Moderately Satisfactory	19.74
07	28-Apr-2012	Moderately Satisfactory	Moderately Unsatisfactory	24.50
08	23-Sep-2012	Moderately Satisfactory	Moderately Satisfactory	36.92
09	31-May-2013	Satisfactory	Satisfactory	58.18
10	12-Dec-2013	Satisfactory	Satisfactory	76.02
11	13-Apr-2014	Satisfactory	Moderately Satisfactory	77.95
12	07-Oct-2014	Satisfactory	Moderately Satisfactory	95.49
13	18-Feb-2015	Moderately Satisfactory	Moderately Satisfactory	97.17
14	14-Aug-2015	Moderately Satisfactory	Moderately Satisfactory	121.35
15	01-Mar-2016	Moderately Satisfactory	Moderately Satisfactory	131.34
16	12-Sep-2016	Satisfactory	Moderately Satisfactory	151.43
17	15-Feb-2017	Satisfactory	Moderately Satisfactory	151.43
18	31-Aug-2017	Satisfactory	Moderately Satisfactory	183.98
19	09-Mar-2018	Satisfactory	Satisfactory	184.03
20	10-Sep-2018	Satisfactory	Satisfactory	196.43

**SECTORS AND THEMES****Sectors**

Major Sector/Sector (%)

Education 100

Public Administration - Education 5

Tertiary Education 95

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3) (%)

Human Development and Gender 100

Education 100

Access to Education 25

Science and Technology 25

Teachers 25

Standards, Curriculum and Textbooks 25

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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

- Country context.** At the time of appraisal, Bangladesh had a population of 145 million people and a per capita gross national income of US\$599 (provisional in 2007–2008), and recorded impressive progress in poverty reduction and a number of human development outcomes. Per capita gross domestic product growth was above 5 percent from the early 2000s, while headcount poverty declined from 59 percent in 1991 to 40 percent in 2005. Gross primary school enrollment rate at the time was around 90 percent, secondary school enrollment doubled from the time of independence, and the gender parity target of the Millennium Development Goals was achieved both at primary¹ and secondary education levels.
- Sector context.** The Ministry of Education (MoE) has the overall responsibility for policy formulation, strategic leadership, and preparation of budget for public funding in higher education. Within the MoE, the University Grants Commission (UGC) was commissioned in 1973 to oversee all universities, and as the intermediary between the Government and the universities, to regulate the university affairs. At the time of appraisal there were 81 universities (30 of them public and 51 private) that provided four types of higher education in the country: (a) general education; (b) science, technology, and engineering education; (c) agricultural education; and (d) medical education. The public and private universities accounted for 17 percent of total enrollments in higher education.
- Higher education at the time of project design was beset with several deeply rooted and intertwined challenges. These challenges included underprepared incoming university students due to low quality of basic education, limited access to higher-level institutions, low level of research and research capacity, weak governance and management practices, weak sector planning and monitoring capacity, inadequate funding level and mechanisms, and politicization of the sector. In view of these challenges, the Government prepared the Higher Education Strategic Plan 2006–2026, which was fully homegrown with participation of front-line academics from both public and private universities and representatives from think tanks and the private sector. The plan signaled a strong commitment by the Government to the development of higher education, identifying challenges and recommendations for addressing challenges in the sector.
- Rationale for World Bank support.** Higher education is a necessary ingredient of Bangladesh's strategy to energize the economic environment and to boost the investment climate, and this strategy constituted the first pillar of the World Bank's FY2006–2009 Country Assistance Strategy (CAS). The Government was determined to support the implementation of the Strategic Plan and to accelerate reforms in the higher education sector. As part of the plan, the World Bank's persistent support to primary and secondary education was understood to be complemented by parallel support to higher education. The substantial support needed at the lower levels—few other development partners have demonstrated an interest and/or the capacity to intervene in the complex higher education sector—left the World Bank

¹ In Bangladesh, primary level consists of Grades 1–5, while secondary level consists of Grades 6–10.



and its vast knowledge of the sector to fill the gap. The World Bank also brought extensive technical and operational experience in implementing innovation funds for promoting research and innovation, institutional capacity building, and improved governance in higher education through projects in over 20 countries, including South Asia Region countries such as India and Sri Lanka at the time.²

5. **The proposed operation was designed to finance initiatives to revamp universities' quality, relevance, governance, and management, as acceptable to the academic community.** The Higher Education Quality Enhancement Project (HEQEP) was the first large project in the higher education sector supported by any development partner in Bangladesh. Thus, most lessons incorporated in the HEQEP were the result of experience gained by the World Bank in its support of higher education in other countries. The project was deliberately designed to be a low reform-intensive project avoiding controversial measures. Once sufficient progress was demonstrated under this operation, it was anticipated that opportunities and consensus for pursuing reforms in higher education will arise. The HEQEP would become the first building block of long-term support and pave the way for more systemic changes of a wider coverage when circumstances allow. By building up the strategic planning capacity of the UGC, the project was expected to foster the development of sound and analytically grounded reforms in the future.

Theory of Change (Results Chain)

6. Figure 1 illustrates the Theory of Change for the HEQEP, which has been constructed considering the activities, outputs, and outcomes under both the original financing and additional financing (AF). The HEQEP's development outcomes would ultimately contribute to achievement of the national and sector development priorities in improving the quality of higher education and contributing to the development of a knowledge economy. The project aimed to achieve two main objectives: first, to improve the quality and relevance of teaching in higher education institutes (HEIs) and second, to improve the research environment of HEIs.

7. To achieve the objective of improving the quality and relevance of teaching in HEIs, the project encompassed the following set of critical activities: (a) provision of Academic Innovation Funds (AIFs) on a competitive basis for upgrading teaching-learning facilities, conducting self-assessments, and implementing university-wide developments (for example campus networks and library automation); (b) building institutional capacity of the UGC and universities through the development of the Higher Education Management Information System (HEMIS) and professional development opportunities for UGC and university faculty and staff; (c) establishment of the Bangladesh Research and Education Network (BdREN) and the UGC Digital Library to improve the quality of Internet connectivity and improve access to e-resources respectively at universities; and (d) introduction of a quality assurance (QA) mechanism at the national level through enactment of the Bangladesh Accreditation Act and at the institutional level through establishment of the Institutional Quality Assurance Cells (IQACs) at the universities. These activities would improve teaching-learning quality of higher education, and enhance institutional capacity at the central and institutional levels contributing to the objective of improving the quality and relevance of teaching in the HEIs.

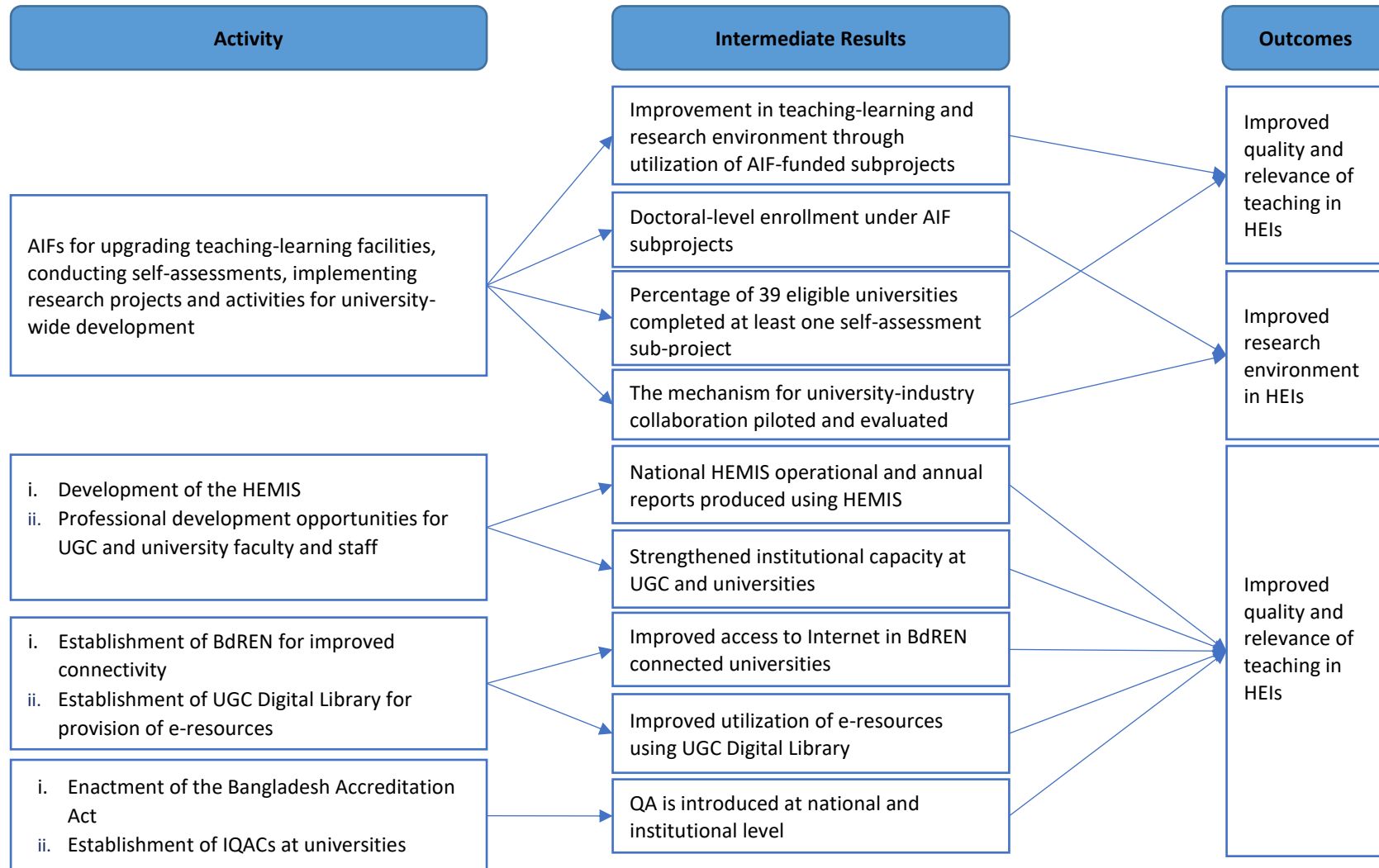
² Saint, W. 2006. "Innovation Funds for Higher Education; A User's Guide for World Bank Projects."



8. To achieve the objective of improving the research environment of HEIs, the project provided a competitive AIF to enhance research capabilities at the universities. The AIF-supported research areas included upgradation of research labs and provision of modern equipment; research capacity-building training; enrollment of postgraduate students including doctoral students; and university-industry collaboration in research. These activities would enhance the research capabilities and promote research in the universities.



Figure 1. Theory of Change for the HEQEP





Project Development Objectives (PDO)

9. The objective of the project is to improve the quality and relevance of the teaching and research environment in higher education institutions through encouraging both innovation and accountability within universities and by enhancing the technical and institutional capacity of the higher education sector.

Key Expected Outcomes and Outcome Indicators

10. As per the original Project Appraisal Document, the PDO has two key objectives which were measured by the following three outcome indicators:

Objective 1: Improve the quality and relevance of teaching in higher education institutions

- (a) Increased level of satisfaction of students and faculty staff regarding the quality of teaching and research environment, and of employers regarding the relevance of teaching and research programs
- (b) Proportion of students and faculty staff with access to advanced Internet connectivity.

Objective 2: Improve the research environment in higher education institutions

- (a) Institutionalization of a competitive funding mechanism for teaching and research through increased allocation in the Medium-Term Budgetary Framework (MTBF).

Components

11. **Component 1: Promoting Academic Innovation (Estimated: US\$93.2 million of which IDA US\$89.3 million; Actual: US\$116.12 million).** The component focused on establishing the enabling conditions to enhance the quality and relevance of teaching, learning, and research in universities and introducing an efficient instrument for the allocation of additional public funds to universities with an emphasis on innovation and accountability. This component aimed to instill changes within the academic community to invigorate teaching, improve learning, and boost research, in areas of priorities for national development, relying on demand from this community. It also aspired to rationalize resource allocation by setting up a mechanism based on performance rather than inputs. The approach is to reward academic units that demonstrated vision, innovation, and discipline, instead of imposing rules in a top-down mode. Additional objectives of this component were to infuse universities with project management, procurement, and financial management (FM) capacity, and to identify and nurture leaders within the higher education sector.

12. **To achieve the objectives, the AIF was designed to improve the quality of academic activities and outcomes, to promote and implement departmental or programmatic self-assessment exercises, to encourage cross-disciplinary or interinstitutional academic collaboration, and to promote the use of modern communication technologies.** The participating universities were grouped into three categories according to characteristics such as enrollment, type, and capacity to ensure a level playing field for universities. AIF resources were to be made available as a grant for all eligible public and private



universities on a competitive basis. At the time of appraisal, the Government of Bangladesh (GoB) determined that any intervention to improve quality and relevance of university education should include private universities, which comprised two-thirds of all university students. Participation of universities in the project was expected to be voluntary; the principles of the program included strict impartiality and transparency regarding selection criteria and procedures, and public disclosure of the decisions. The AIF process was led by the higher education community—from proposal writing to evaluation to implementation—which built strong ownership and garnered acceptance. These key features were built in the AIF design to yield expected results. Once subprojects were selected, they would be implemented with the support of AIF resources through three competitive windows geared toward improvement of teaching and learning, enhancement of research capabilities, and implementation of university-wide innovations.

13. **Departments of the universities, institutes, affiliated centers, universities themselves, and any of their combinations were to be eligible to compete for the funds, subject to compliance with clear and objective criteria.** Independent Area Review Panels were to evaluate the proposals based on well-defined criteria. The AIF funds were to be administered based on the agreed procedures in the Operations Manual (OM). The AIF financing was intended for a variety of expenditures such as faculty staff training, academic collaboration, procurement of goods and services, and small renovation and refurbishing of lecture/study rooms, laboratories, and workshops. There were three specific windows for the AIF use: (a) teaching-learning facilities, (b) research capabilities, and (c) university-wide innovation. Through the AIF, eight **fabrication laboratories (FabLabs)** were also established in selected universities. After the AF, another window was introduced under university-industry collaboration. Because the AIF was a demand-side intervention, only non-eligible expenditures were comprehensively listed in the OM, and thus apart from the ones listed all activities contributing to the achievement of expected results and measurable impact were eligible.

14. **Component 2: Building Institutional Capacity (Estimated: US\$8.5 million of which IDA US\$7.1 million; Actual: US\$6.80 million).** The objective of this component was to reinforce the strategic and institutional capacity of the sector, both at the central level and at the level of higher education institutions (HEIs). The component included the following subcomponents: (a) improving the strategic capacity of UGC and (b) strengthening universities' institutional capacity. The catalytic of this component was to bring the needed supply-side support to improve the efficiency of universities and higher education authorities. It was designed to allow the first component to yield its full benefit and to facilitate the formation of positive externalities.

- **Subcomponent 2.1 - Improving the Strategic Capacity of UGC.** This subcomponent aimed to endow the UGC with the human and information resources needed to steer the higher education sector, and to bestow the commission with the capacity to strategize the future development of the sector. To this end, the project aimed to support capacity building for strategic planning in the higher education sector, develop a HEMIS, and upgrade the UGC's management capacity.
- **Subcomponent 2.2 - Strengthening the Institutional Capacity of Universities.** The objectives of this subcomponent were to increase awareness about the AIF among the key stakeholders through appropriate media and communication campaigns. These campaigns were to focus on academic innovation and institutional capacity enhancement,



strengthening institutional capacity for preparation and evaluation of AIF proposals, and implementing and managing subprojects for AIF-eligible public and private universities.

15. **Component 3: Raising the Connectivity Capacity of the Higher Education Sector (Estimated: US\$84.9.0 million of which IDA US\$71.5 million; Actual: US\$45.91 million).** The objective of this component was to de-silo Bangladesh's universities and integrate them into the globalized world of knowledge. The main activity was intended to establish a BdREN and to facilitate access to the repository of global knowledge through connection to a digital library.

16. The project supported the creation of the BdREN, a high-performance Information and Communications Technology (ICT) network providing connectivity among education and research institutions in both public and private sectors to enable academics, scientists, and researchers engaged in higher education and research to communicate with peers within the country. The network supports geographically dispersed academics, scientists, and researchers with reliable access to high-end computing, simulation tools, and datasets, and was designed to relate to other regional and transcontinental research and education networks, linking faculty and students of Bangladesh to the global academic community and learning resources. At the time of appraisal, some 20 universities and research institutions in Bangladesh were provided subscriptions to digital resources but only in a limited way and with poor connectivity. To address this situation, the HEQEP was to facilitate access to the global repository of knowledge through subscription to a digital library on behalf of the participating universities by forming a consortium and to work closely with the BdREN.

17. **Component 4: Establishment of Quality Assurance Mechanism at the Institutional Level (Estimated: US\$37.0 million of which IDA US\$27.0 million; Actual: IDA US\$15.83 million).** Component 4 was new under the AF. The objective of the component was to ensure quality of higher education in Bangladesh through the establishment of QA mechanisms at the national and institutional levels.

- **Subcomponent 4.1 - Establishment of QA Mechanism at the National Level.** The objective of this subcomponent was to provide funds for the establishment of a national QA mechanism—to establish the Quality Assurance and Accreditation Council for Bangladesh (QAAC). The project supported strengthening of the Quality Assurance Unit (QAU), which was designed to oversee the establishment of the IQAC at the university level. The QAU was to serve as the temporary council until the formation of what would become the Accreditation Council Bangladesh (ACB). The component was designed to finance staffing, hardware, and software (including staff development) necessary for the QAU to be implemented by the Higher Education Quality Enhancement Project Unit (HEQEPU) and provide technical assistance in the areas of QA.

18. **Component 5: Project Management, Communication, Monitoring and Evaluation (Estimated: US\$14.4 million of which IDA US\$11 million; Actual: US\$16.43 million).** The overall responsibility for the project was charged to the UGC which was the implementing agency. A Project Management Unit (HEQEPU) was established at the UGC to ensure smooth project implementation, led by the full-time Project Director. The HEQEPU was designed to be staffed with technical, procurement, and FM staff and its primary functions were to plan, manage, implement, and coordinate activities under the proposed project. A Monitoring and Evaluation Unit (MEU) was set up to systematically document all project inputs, processes, outputs, and outcomes and link project interventions with outcomes to indicate the extent of



progress and achievement of objectives. The project supported the unit in charge of M&E and was accountable for the technical assistance needed to perform M&E activities.

19. **A set of core indicators for measuring inputs, processes, outputs, and outcomes, with baseline and target values, were developed to measure the impact of the project.** A comprehensive and integrated data monitoring system was to be put in place to ensure that all project inputs, process, outputs, and outcomes were monitored from the very inception of the project. Consultants were to be procured for the third-party effectiveness evaluation. In addition to the evaluation built into the continuing monitoring of the project activities, a satisfaction survey was to be carried out targeting students, faculties, and employers of the AIF beneficiary institutes/departments to assess how the direct beneficiaries value the interventions under the AIF during three times of the project life. An effectiveness evaluation was designed to be carried out to focus on the outputs of the interventions and was designed to include a detailed baseline survey and follow-up surveys to measure the effectiveness of project interventions. During implementation, HEQEP M&E conducted effectiveness studies on each activity as part of an impact assessment.

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

20. The project's development objective was not changed during the project period.

Revised PDO Indicators

21. **In January 2013, there was a level 2 restructuring with changes in PDO indicators and targets.** The restructuring involved a revision of the PDO indicators to better align with the restructured project activities, ensure realism of end of project targets, and streamline the overall Results Framework. Four changes to be made to the PDO outcomes are (a) reduced target under outcome indicator 1 (improvement of satisfaction of students, faculty, and employers) from 20 percent to 10 percent to increase the realism of targets; (b) revision of outcome indicator 2 (institutionalization of competitive funding) to a measurable target as the MTBF did not include a budget head for competitive funding; (c) revision to outcome indicator 3 (proportion of students and faculty with access to advanced Internet connectivity) to a new measure tracking the number of universities connected to the BdREN; and (d) a core indicator on beneficiaries is added as outcome indicator 4.

22. **On December 13, 2013, an AF of US\$125 million was approved.** The outcome indicators were revised to reflect the expanded project scope supported through the AF through new indicators while the existing ones were made more ambitious. The revised Results Framework included two additional PDO-level indicators to measure new activity on QA and to track outcomes of AIF-supported research activities. These two new outcome indicators were PDO 5 - Number of IQAC established and produce self-assessment based on the established framework and PDO 6 - Number of academic publications produced by beneficiaries of AIF subprojects.

23. The PDO indicator on 'Number of universities (public and private) connected to BdREN' was moved to the intermediate outcome level indicator. This was because PDO 3 tracked utilization of



BdREN, which made it a better outcome level measure of the objective to improving teaching-learning in the universities. Additionally, PDO indicator 1, which tracked satisfaction levels, was revised with increased targets to reflect the expanded scope of activities, expected to now have more impact on raising the level of satisfactions of students, teachers, and beneficiaries. The target for total beneficiary number under PDO indicator 4 was also increased to reflect the expanded coverage and scope of the AF.

24. During the AF, the changes in the Results Framework were mainly refinement of the outcome indicators to capture new and expanded activities. The increased targets under PDO indicator 1 and PDO indicator 4 were higher than the targets set under the original design. Hence, the overall revisions in the PDO indicators did not unfavorably impact the scope or ambition of the project.

Table 1. Revisions to the Results Framework: Project Development Outcome Indicators

#	Indicator Name	Changes during Restructuring
PDO Indicators		
1	Increased level of satisfaction of students and faculty staff regarding the quality of teaching and research environment, and of employers regarding the relevance of teaching and research programs (%) - five-point scale (a) Student Satisfaction Surveys (b) Faculty Satisfaction Surveys (c) Employer Satisfaction Surveys	(a) Targets were revised downwards from 20% increase to 10% increase to align with expected project outcomes in January 2013 restructuring; and (b) Targets were later revised upward to 21 % increase for students, 38% increase for faculty, and 40% increase for employers.
2	Number of academic publications produced by beneficiaries of AIF subprojects	Added during the AF/restructuring in December 2013
3	All research and teaching and learning funds under UGC are distributed using an identified set of rules based on transparency and competition.	Original indicator “Institutionalization of a competitive funding mechanism for teaching and research through an increased allocation in the Medium-Term Budgetary Framework (MTBF) [%]” replaced by current PDO indicator 3
4	Number of direct beneficiaries of the project (of which females [%]) - Direct beneficiaries defined by students and teachers of AIF subprojects and the BdREN	
5	Monthly average volume of inbound education/research data traffic in BdREN	Original Indicator “Number of universities (public and private) connected to BdREN” was converted to intermediate indicator and replaced by current PDO indicator 5
6	Number of IQAC established and produce self-assessment based on the established framework	Added during the AF/restructuring in December 2013

Table 2. Revisions to the Results Framework: Intermediate Outcome Indicators



#	Indicator Name	Changes during Restructuring
Intermediate Indicators		
1	<i>Teaching and Learning</i> Percentage of fund utilization by teaching and learning subprojects (Window 1); Rounds 1–3	Original PDO Indicator “Teaching and Learning. Proportion of subprojects implemented according to the plan [%]” was replaced by intermediate outcome indicator 1
2	<i>Research</i> Percentage of fund utilization by research subprojects (Window 2); Rounds 1–3	Original PDO Indicator “Research. Proportion of subprojects implemented according to the plan [%]” was replaced by intermediate outcome indicator 2
3	Percentage increase (cumulative) in doctoral level enrollment (%) under AIF subprojects	Original PDO Indicator “Percentage increase in doctoral level enrollment [%]” was clarified and reconfigured into intermediate outcome indicator 3
4	Percentage of 39 eligible universities completed at least one self-assessment sub-project [%]	No change.
5	The mechanism for university-industry collaboration piloted and evaluated.	Added during the AF/restructuring in December 2013
6	National HEMIS is in place and operational at UGC	Original intermediate outcome indicator “Number of analytical studies carried out for updating Higher Education Strategy” replaced by intermediate outcome indicator 6
7	Proportion of institutions covered under awareness campaign (%)	No change
8	Number of universities (public and private) connected to BdREN	Original indicator “Proportion of students and faculty staff with access to advanced internet connectivity [%]” was moved from PDO and converted to intermediate indicator
9	Number ('000) of online journal title accessed and downloaded using UGC Digital Library on average per (month)	Original indicator “Number of online journal title subscriptions ('000) through the UGC Digital Library” was updated to reflect increased target and measure output
10	QA Unit is fully functional and operational	No change
11	HEQEP Unit is fully functional and operational	No change
12	Completion of baseline survey, follow-up survey at midterm and endline survey, and tracer studies	Original intermediate outcome “Completion of baseline survey, follow-up survey at mid-term and end-line survey” revised to reflect additional tracer studies

Revised Components and Scope

25. **The original scope of the project was extended under the AF while the PDO remained the same throughout the project’s life.** The original project had four components: 1 - Promoting Academic Innovation; 2 - Building Institutional Capacity; 3 - Raising Connectivity of the Higher Education Sector; and 4 - Project Management and M&E. The AF added financing to the four original components and a new Component 4 on Establishment of Quality Assurance Mechanism at the Institutional Level. The following



specific changes were made to the project design as part of the AF:

- (a) Component 1. The AF would finance a third round of the AIF which included a new additional window named 'Innovation Fund' to support stronger university-industry links.
- (b) Component 2. A scale-up of activities that were designed to support the capacity building in higher education including (i) improving the strategic capacity of the UGC; (ii) strengthening the institutional capacity of the universities; and (iii) supporting local, international, and online intellectual property/patent training. The scaled-up activities under this component complemented the expanded activities under Component 1 to ensure success of the AIF activities through enhanced capacity at various levels of the higher education system.
- (c) Component 3. A scale-up of activities to use full potential of the connectivity facilities including (i) strengthening and scaling up its management structure including technical and management competencies of BdREN staff and fully supporting all the services up to field level; (ii) expanding the network and its services to ensure BdREN's optimal utilization at the selected universities (campus network, video conference facility, and so on); (iii) ensuring good governance and strong ownership by the stakeholders, including acquiring high-quality connectivity to provide cost-effective connectivity to the educational institutions.
- (d) Component 4. A new component added on establishment of QA mechanisms at the national and institutional levels. Under the AIF, self-assessments were conducted in several universities which laid the foundation for introduction of QA in the higher education system in Bangladesh. Under the AF, this component was designed to support (i) strengthening of the UGC's QAU and establishment of the QAAC and (ii) establishment of IQACs at the universities.
- (e) Component 5. With the expanded scope of the project, this component was also scaled up accordingly to enhance communication and monitoring and evaluation (M&E) activities.

Other Changes

26. **In addition to the changes to the Results Framework, the original credit closing date was extended from December 31, 2013, to October 31, 2015 under the first restructuring, and then to December 31, 2018, under the AF restructuring.** The reason for closing date extension was because of the initial delays in the implementation of the AIF and other project activities such as improving strategic planning capacity of the UGC and establishment of the BdREN. Key project activities were at the time new to the sector and ambitious in their nature and required significant mindset changes and a lot of learning by doing, both of which are time consuming. In particular, careful selections of the AIF competitive grant from a large number of subproject proposals required a substantial amount of time especially in the first two rounds. Delays in the implementation of the BdREN, due in part to growing pains that come with corralling disparate universities into a single network, necessitated extended time for implementation. Connecting universities all around the country including laying fiber optic cables and ensuring connectivity required permission and logistical coordination across different levels and agencies. Thereafter, the project closing date was extended once again through the AF restructuring reflecting the extended scope of the project.



27. **Reallocation.** Under the January 2013 restructuring, SDR 4.5 million was reallocated to Component 3 (Raising the Connectivity Capacity of the Higher Education Sector) from other components to meet additional funding needs for establishment of the BdREN. Specifically, SDR 3.8 million from Component 1, SDR 0.35 million from Component 2, and SDR 0.34 million from Component 4 were reallocated to Component 3.

Rationale for Changes and Their Implication on the Original Theory of Change

28. **The modifications at the restructurings in January 2013 and December 2013 did not affect the Theory of Change but were enacted to build on the successful implementation of reforms under the original project and expand the successful reforms in the areas of quality enhancement of higher education, research and innovation, and governance.** By the time of the restructuring and the AF in December 2013, the pace of implementation had been rapid and the project showed progress against outcomes and intermediate outcome indicators, including (a) increased satisfaction in all key stakeholders (students, faculty, and employers), based on midterm satisfaction surveys; (b) accelerated fund utilization by the subprojects under the AIF-based technical assistance and training provided by the UGC and the project unit; (c) competitive funding process proceeded according to schedule; (d) access to the BdREN increased to 12 percent of students and 18 percent of faculty members (compared to 0 percent at baseline); and (d) the digital library was at that point established and fully operational in 34 universities.

II. OUTCOME

A. RELEVANCE OF PDOs

Assessment of Relevance of PDOs and Rating

29. **Relevance of PDOs is rated as High as the PDO.** The objectives of the project have remained highly relevant to Bangladesh's long-term objective of developing the human capital and of sustaining economic growth and poverty reduction.

30. **The objectives of the project were well aligned with Bangladesh's Seventh Five-Year Plan (FY2016–FY2020), which had an overarching theme of 'Accelerating Growth, Empowering Citizens'³.** Aligned with the United Nations' Sustainable Development Goals, the Seventh Five-Year Plan aimed to develop strategies, policies, and institutions to accelerate inclusive growth, reduce poverty, empower citizens, and promote sustainable development. One of the pillars of the plan included education as a part of the overarching goal of human resource development. Under the plan, the GoB endeavors to improve the human capital base such that it will be ready to respond to a growing and changing economy, with Bangladesh asserting its role in the global economy. The Seventh Five-Year Plan placed a greater emphasis on secondary and higher education than in earlier plans, including vocational and technical education for developing skills needed for employment and modern life. At the time of the plan's development, enrollment in Bangladeshi higher education expanded at an annual average pace of 12 percent, from 1 million in FY2005 to 2.2 million in FY2012, owing to the improved graduation at the secondary level and growing share of private sector delivery of higher education.

³ Seventh Five-Year Plan "Accelerating Growth, Empowering Citizens" FY2016–FY2020, Bangladesh, 2016.



31. **The GoB recognized human development as an input to the goal of inclusive and shared economic growth and poverty alleviation, with education as a primary component of human development along with health.** Couched within that, the Government considered⁴ university education as the engine of growth for economic and social development of a nation, as it instills the skills and technical expertise from which economic and social development spring forth. The HEQEP was included in a review of key initiatives taken in higher education since the Sixth Five-Year Plan⁵. The plan noted that further projects will be taken up with regard to QA and accreditation owing to the progress made under the HEQEP and the continuing need to improve quality in higher education. The BdREN was to be further developed during the Seventh Five-Year Plan as part of Government policy of establishing Digital Bangladesh, empowered to adapt to rapid change in the sector at the national and global levels.

32. **The project is aligned with the Country Partnership Framework (CPF) updated for the period of FY2016-FY2020.**⁶ Higher education figured prominently in the second social inclusion focus area, along with growth and climate and environmental management in the CPF. The HEQEP directly supported the social inclusion focus area, which aimed to consolidate the equity and access gains in health and education, address the next generation of challenges related to quality, strengthen higher education and skills development, expand social protection coverage, and improve rural livelihood opportunities. The CPF's second objective included improved quality in education, to which the HEQEP directly contributed by design as part of the World Bank Group's overall support focus on quality and relevance of education as an important priority.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

33. **The efficacy of the PDO is overall rated Substantial.** Achievement of the PDOs is assessed for efficacy against two outcomes:

- (a) Improve the quality and relevance of teaching in HEIs
- (b) Improve the research environment in HEIs

34. The HEQEP's outcomes were measured through 6 PDO-level indicators and 12 intermediate indicators. Overall, the achievements in the PDO-level indicators and intermediate indicators point to high performance and strong impact of the project interventions. As discussed earlier, though the target for the PDO indicator 1 'satisfaction level' was revised downward in January 2013 restructuring, it was revised upward during the AF restructuring in December 2013 after the pace of implementation improved, while new indicators were added and the existing ones were made more ambitious. By the project closure, all PDO indicators were met or exceeded, except for a sub-indicator of level of satisfaction of students, which was narrowly missed. Moreover, 10 out of the 12 intermediate indicators were met or exceeded the target.

⁴ See National Education Policy 2011.

⁵ Sixth Five-Year Plan "Accelerating Growth and Reducing Poverty" FY2011–FY2015, Bangladesh.

⁶ Country Partnership Framework, Bangladesh, FY2016–FY2020, 2016.



35. **The HEQEP took an innovative approach of using satisfaction ratings to track improvements in quality and relevance of education to overcome inherent difficulties of measurement of quality of higher education services.** Assessing quality and relevance of higher education directly is known to be difficult due to complex and diverse nature of higher education institutions and programs. High-level cognitive skills development of students are also extremely difficult to capture quantitatively. The project used an innovative way to use a set of satisfaction surveys that allows triangulation of responses and tracking changes over time by obtaining satisfaction ratings from three different key stakeholders at three different times of the project cycle. Faculty members would be best positioned to identify improvements in teaching and researching environment, while employers would be able to evaluate relevance of graduates’ knowledge and skills, hence relevance of education. The standardized methodology of the project’s three rounds of satisfaction surveys allowed reliable tracking of changes over time in satisfaction ratings.

(a) Improve the quality and relevance of teaching in HEIs

36. **The PDO indicator of the beneficiary satisfaction indicates high satisfaction among faculty members and employers about quality and relevance of education and research environment.** Satisfaction levels of different stakeholders about quality and relevance of education and research environment were measured through PDO indicator 1 (Increased level of satisfaction of students and faculty staff regarding the quality of teaching and research environment, and of employers regarding the relevance of teaching and research programs). It indicates significant improvements in satisfaction levels among these stakeholders especially for faculty members and employers (table 3).

Table 3. Satisfaction Levels of Different Stakeholders (PDO indicator 1)

	Baseline	Achieved at the AF	Achieved at Completion	EOP Targets	Improvement during Project
Students	3.3	3.6	3.7	4.0	0.4
Faculty	2.9	3.8	4.0	4.0	1.1
Employer	3.0	3.9	4.1	4.2	1.1

Note: EOP = End of project.

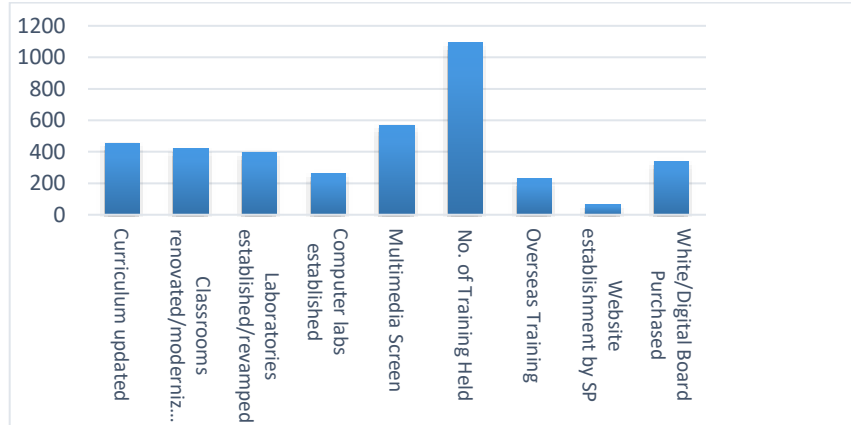
37. **Satisfaction levels increased substantially over the project life, though it did not reach the target; beneficiaries are particularly satisfied with key aspects of the teaching and learning environment that were supported by the project.** Satisfaction levels of faculty members and employers improved more than one point in the five-point Likert scale and achieved or almost achieved the EOP targets. These are significant hikes in this type of measurement and it speaks of substantial improvements in the assessments of stakeholders about quality of education and research environment (especially for faculty members) and relevance of education (especially for employers). The endline satisfaction survey particularly finds high levels of satisfaction among teachers regarding access to online journals and e-resources, quality of Internet, and availability of modern lab equipment and facilities, which were supported by the project. The HEQEP supported upgradation of labs through AIF funding as well as access to high-speed Internet connectivity through both the BdREN and campus network development. The UGC Digital Library provided access to over 30,000 e-resources, including high-quality journals, in more than 80 public and private universities. These project-supported activities would have contributed to an improved teaching-learning environment and higher satisfaction levels among teachers, especially those in AIF-supported departments.



38. The HEQEP contributed to the outcome of improved quality and relevance of teaching in HEIs through AIF subprojects focused on enhancing the teaching skills of staff, modernizing curricula, providing modern teaching tools, and improving the educational infrastructure.⁷ AIF funding was used to enhance professional skills of academics to provide innovative and quality teaching environment for students. The curricula were updated in 103 programs to be more student-centered and develop competencies in multiple disciplines, including higher-order cognitive and soft skills development.⁸ These efforts would have contributed to graduates enhancing important job-specific skills, as the survey finds employers of graduates of AIF beneficiary departments reported being satisfied with the quality of graduate skills in decision making, computer skills, and problem solving skills, among others.

39. **The AIF subprojects enabled the universities to enhance facilities and equipment for teaching and learning, improve teaching contents, and train teachers through in-country and overseas trainings, leading to substantial improvement in quality of education in universities.** Under Round 1–3 AIFs, curriculum was updated in more than 450 programs, more than 400 classrooms were renovated, and around 400 laboratories were upgraded with state-of-the art technologies. Furthermore, around 1,100 in-country trainings and more than 210 overseas trainings were organized to train teachers with academic skills. Classrooms were much more digitized as more than 300 classrooms were furnished with digital boards and more than 500 multimedia screens were installed. It is evident that all these investments in the teaching and learning environment significantly contributed to improvement of quality and relevance of education in universities in Bangladesh. In addition, around 17,000 latest books and over 1,200 journals were provided to departments.

Figure 2. Major Investment Results of AIF for Teaching And Learning



Source: 16th Semi-Annual Monitoring Report of the HEQEP.

⁷ As per the final HEQEP Project Completion Report (PCR), some of the outputs generated by AIF subprojects for improving the quality and relevance of teaching include the following: (a) 27,051 students and staff have received training, (b) 15,350 ICT equipment for teaching installed across 38 universities, (c) 2,955 office equipment added to universities, (d) 41,184 books and journals have been procured for offices/libraries, (e) 1,653 classrooms/labs/offices renovated and furnished, (f) 41,184 books and journals added to libraries, (g) 12,012 faculty have received training in various disciplines, (h) 618 master’s program students given the chance to pursue advanced study and research, (i) 9 libraries modernized and automated with modern library management system, (j) 517 faculty have received training from international universities, and (k) 103 curricula updated.

⁸ For example, the Independent University Bangladesh used the AIF to establish the Center for Cognitive Skills Enhancement that aims to build higher-order cognitive skills through engaging undergraduate students in logic, rationalization, problem solving, and decision-making experiences using digital tools such as games and apps as well as active learning experience such as research activities.



Table 4. Feedback from AIF Subprojects on Improvement in Quality and Relevance of Education

Quality and Relevance of Teaching and Learning	Quality of Research
<ul style="list-style-type: none"> • Increased interactive classroom • Provided technology-based teaching-learning • Provided evidence-based knowledge • Produced knowledge-based skilled generation 	<ul style="list-style-type: none"> • Increased number of quality research, researchers, publications, research-based, degrees, research opportunity, research issues • Installed software and equipment for research • Increased access to huge literature for research
Infrastructure Development	Making Good Digital Connectivity
<ul style="list-style-type: none"> • Established digital labs, FabLabs • Established language labs • Renovated labs • Renovated classrooms with multimedia, air conditioning, and good furniture • Replaced old instruments by new instruments • Renovated library with IT equipment and software 	<ul style="list-style-type: none"> • Established inter and intra departments network to check research work • Provided Internet and Wi-Fi facilities for students and teachers • Established a cluster computer • Digitalization of library connected with renowned publishers • Developed a digital database

Source: Final Impact Assessment of HEQEP 2018.

40. Faculty members are best positioned to assess the quality of the teaching and research environment as they are directly engaged in these activities and witness changes over time within a department or university. Employers are best positioned to assess the relevance of education as they possess firsthand understanding about the kind of knowledge and skills that university graduates bring with them when joining their firm and also they observe over time changes in the quality of fresh university graduates in entry-level jobs. Improved satisfaction levels among these two key stakeholders are particularly evident in satisfaction surveys, which are highly indicative of enhanced quality and relevance of teaching-learning and research. On the other hand, satisfaction level of students showed a somewhat modest improvement of 0.4 points and missed the EOP target by 0.3 points. This gap is likely a result of two factors. First, student cohorts to be sampled were, by nature of the survey, always new cohorts who have had only a few years in university. As new cohorts develop their expectation based on the relatively recent situation at the time of their joining the university, they thus can only make relatively short-term comparisons about improvements in the learning environment. As such their satisfaction levels are more likely to be modest compared to faculty members and employers who tend to base their perception on much longer-term comparisons. Furthermore, it is also possible that undergraduate students have limited research activities and thus did not directly benefit from improvements in the research environment where the project made a lot of investment.

41. **The HEQEP successfully supported the operationalization of and capacity development for a transparent competitive funding mechanism for teaching and learning and for research and innovation funding.** The AIF’s adherence to a transparent and competitive process was tracked in PDO indicator 2: All research and teaching and learning funds under the UGC are distributed using an identified set of rules based on transparency and competition. At the baseline, the funding mechanism was not competitive and yet to be fully established. As of the restructuring in December 2013, the UGC had commenced design of the competitive funding program. By closing, the competitive funding mechanism was revamped and implemented, meeting the final target. The evaluation study commissioned by the project found that “fund allocations of AIF Window-1 (Teaching & Learning) and Window-2 (Research) of Round 1, 2, 3 and 4 of AIF were made following transparent procedures as per Operations Manual and



maintaining competitive selection procedure by the renowned experts and competent authority. Moreover, similar procedure was used for awarding QA and BdREN subprojects.” The UGC has demonstrated fully developed capacity for handling the new competitive funding mechanism. Through four rounds of the innovation fund, the UGC provided competitive funding to as many as 439 subprojects across 38 public and private universities. For intermediate indicator 1 on the percentage of fund utilization by teaching and learning subprojects, no baseline was set. At restructuring, Round 1 had reached 93 percent fund utilization, and Round 2 had reached 33 percent fund utilization. At project closure, all rounds had reached 100 percent utilization, meeting the targets. Intermediate indicator 5 on the mechanism for university-industry collaboration was piloted and evaluated. The evaluation finds that the university-industry collaboration was effective in developing “products which were knowledge creating, eco-friendly as well as beneficial for mass people. At the same time, those products had long term value for income generating and creating job opportunities.”⁹

42. **The project successfully boosted the expansion and utilization of a broadband academic digital network and resources through establishment of the BdREN and UGC Digital Library; however, the take-up may have been slower than expected.** PDO indicator 3 (Monthly average volume of inbound education/research data traffic in BdREN) measured the progress of usage of the BdREN. By the time of the AF, the monthly volume of research data traffic had increase from a baseline of 0 TB to over 10 TB of data. At the time of project closure, this indicator had greatly exceeded the target of 100 TB and achieved the monthly average usage of 1,362 TB. This was achieved through both the connectivity expansion of the network to 40 universities and constant improvement in the quality of connectivity such as minimized downtime. Another measure of quality of education and research was establishment of the e-library system, UGC Digital Library. A fully functional e-library platform has been established with subscription to 3,000+ e-journals from ACM, Emerald, JSTOR, and IEEE, and nine e-book providers. A total of 84 universities (34 public, 46 private, 1 international, 1 research institute, and 2 training institutions) signed membership agreements for the e-journals and currently there are 34 e-journal user institutions. For the intermediate indicator 9 on the number ('000) of online journal titles accessed and downloaded using UGC Digital Library, the baseline at the time of appraisal was 0. By the time of restructuring, the project had 12,000 journals downloaded in the digital library, against the target of 25,000 journals. The target set for the end of project was then increased to 37,000 journals. The project did not meet this target, however, and by project closure only 24,300 journal titles could be accessed. This slower-than-expected take-up of UGC Digital Library services can be attributed to (a) inadequate awareness on UGC Digital Library services and (b) higher demand than anticipated in additional types of journal subscriptions by faculty and researchers, which could not be brought under UGC Digital Library provision within project life.

43. **To ensure consistent and universally adopted QA across the affected HEIs, a functional QA system at the central and institutional levels has been established under the project.** PDO indicator 5 (number of IQAC established and produce self-assessment based on the established framework) was added at restructuring. Before introduction of the QA component in the AF, self-assessments were

⁹ Some areas where these subprojects have contributed to developing new technology for commercialization purpose of research outcomes include: low-cost method for detecting breast cancer; developing inexpensive livestock and poultry vaccines; developing quality vaccination for animals; software development; developing a soil testing kit to make able farmers to test their soil in low cost, time, and energy to increase the fertility of soil in the country; holding heat efficiently; designing chip for fabrication; and methods for deriving environment friendly biocomposites and biofuel from agricultural waste.



supported under the AIF activity for 39 eligible universities. The HEQEP surpassed its EOP target of having 50 percent of 39 eligible universities complete at least one self-assessment of a subproject and reaching 126 percent at end line.¹⁰

44. Under the AF, IQACs were the mechanisms to be set up in beneficiary universities to oversee university-wide QA. At the time of restructuring and AF, a formal institution-level QA system was largely absent in the higher education system in Bangladesh. By project closure, 69 QA cells had been set up, exceeding the target of 15, in 28 public and 41 private universities. Moreover, self-assessment committees (SACs) have also been formed and the selected 810 entities completed self-assessment reports (SARs), which are essential elements of institutional QA activities. In addition, 17 (25 percent) IQACs have submitted institutional improvement plans based on the SARs and institutional consultation process. At the central level, the QAU was created within the organizational structure of the UGC with the objective of promoting a quality culture within the HEIs in Bangladesh ensuring good practices and governance. The QAU has accomplished a range of QA outcomes. It drafted Bangladesh Accreditation Council Act (BAC Act 2017) in detail which was passed in the National Parliament in March 2017. The BAC is established as a statutory autonomous entity for accreditation of universities and programs and will be a key cornerstone of the higher education system of the country. The QAU also drafted the National Qualifications Framework of Bangladesh that was commissioned in the National Parliament in 2017. This national qualification framework is a milestone document that provides the foundation of an accreditation process in the country for the first time. It went further beyond its stipulated role to prepare 796 outcome-based education curricula based on the results and requests from self-assessment exercise.

(b) Improve the research environment in HEIs

45. **The HEQEP was highly successful in achieving the outcome of improving the research environment in Bangladesh higher education both in terms of generation of research outputs and nurturing of future academic researchers.** Measurement of the quality of research affected by the project was based on PDO indicator 6, the number of academic publications produced by beneficiaries of AIF subprojects. By December 2013, 65 academic papers had been published by AIF recipients. At project closure, over 778 academic publications were produced by beneficiaries, significantly overachieving the target of 150 publications by 518 percent, which demonstrates the results of the HEQEP's efforts to promote a research culture in the universities. In addition, research outcomes were measured by intermediate indicator 2, percentage of fund utilization by research subprojects (Window 2). At restructuring, Round 1 had reached 79 percent fund utilization, and Window 2 had reached 33 percent fund utilization. At project closure, all rounds had reached 100 percent utilization, meeting the targets. Indicator 3 measured the percentage increase (cumulative) in doctoral level enrollment (%) under AIF subprojects. At restructuring, doctoral level enrollment had reached 41 percent increase from the baseline. By project closure, this indicator far exceeded the project target of 100 percent increase and reached a 368 percent increase.

46. The HEQEP contributed to the improvement of research quality through funding activities focused on enhancing the research facilities and equipment, honing specialized knowledge, promoting university-industry collaboration, and establishing high-quality PhD programs. One of the 'game changing' activity of the AIF was to promote university-industry collaboration with the aim to help

¹⁰ Exceeds 100 percent due to the additional schools in the numerator by the time of the AF in 2013.



develop and commercialize research innovations. Through this activity, eight subprojects were awarded the grant, whereby the industry provided technical knowledge and shared facility services, thus effectively promoting industry partnerships in universities which was severely lacking in the Bangladesh higher education sector. An effectiveness study was conducted to assess the efficacy of the AIF window on university-industry collaboration, which found this activity to have supported the development of products and innovations with high potential to positively impact the lives of the masses (see annex 8 for details of the findings).¹¹

47. Subprojects also set out to improve research capacity at an institutional level, and provide necessary equipment and supplies needed for research. Professional orientation to research and requisite environments were to be couched in the development of high-quality PhD programs that would be connected to HEIs across Bangladesh and to research institutions across the globe. Guiding the development of these programs and the work of their faculty and students would be strengthened by cooperation between industry and academia, the two representing demand and supply of the results of scientific research.

48. Overall, AIF grants financed subprojects to modernize the research facilities and equipment and to enhance the skills and capacities of academic professionals toward establishing environments oriented toward fundamental and applied research. The outputs related to improving the research environment were the following, among others:

- (a) 13,494 lab equipment have been procured
- (b) 170 PhD students enrolled
- (c) 819 articles published in peer-reviewed journals
- (d) 181 papers have been published on conference proceedings
- (e) 200 instances of collaboration opportunities have been established
- (f) 10 patents were filed

Justification of Overall Efficacy Rating

49. **The overall efficacy rating is Substantial.** By the end of the project, all six PDO indicators had met or exceeded their targets, except for one sub-indicator of satisfaction level of students. By project closure, 10 of the 12 intermediate indicators had been met. Though two of the intermediate indicators, number of universities (public and private) connected to BdREN and number ('000) of online journal titles accessed and downloaded using UGC Digital Library on average per month were not met, both indicators had reached roughly 66 percent of their targets. Studies by the project confirm that the quality of teaching and learning and research environment has been substantially improved owing to a large number of investments made in AIF beneficiary departments as well as other project interventions. Considering these significant achievements and the shortfall of one of sub-indicators of a PDO-level

¹¹ SRGB. 2018. "Final Assessment of HEQEP 2018."



indicator, the overall efficacy rating is Substantial.

C. EFFICIENCY

Assessment of Efficiency and Rating

50. The efficiency of the HEQEP is rated **Substantial** following high economic returns and efficiency in project design, which was to some extent hampered due to challenges and delays faced in the early stage of implementation during the project life.

51. **Economic analysis.** The economic analysis at appraisal and at the AF indicated healthy high returns on investment for the HEQEP. At project appraisal, the economic internal rate of return (EIRR) was estimated to be 17.9 percent based on expected benefits from increase in higher education completers and future earnings. The updated EIRR for the AF component also showed a higher return and sound investment at 20.8 percent. This Implementation Completion and Results Report (ICR) conducted a cost-benefit analysis using the same approach, which reveals a positive net present value of US\$728 million and an internal rate of return (IRR) of 52.8 percent, much higher than that at appraisal and the AF. A boon to the project outcome was high returns to higher education in Bangladesh and high growth in university enrollment during the HEQEP implementation period. The detailed economic analysis is provided in annex 4.

52. **Efficiency in design and implementation aspects.** The use of specialized partners and expertise and the leveraging of digital tools for project coordination and data collection boosted efficiency in the implementation of project activities. The international partnership with Kent University was critical for availing highly technical expertise needed for the design and establishment of the BdREN in 38 universities across the country. The use of international technical experts in areas of QA, intellectual property rights, and patenting of research innovations helped the UGC and the HEQEP to successfully implement first-time activities in areas of QA and university-industry collaboration leading to innovation and patenting at the universities. Without support from these specialized entities with substantial expertise, it would have been challenging for the UGC and the HEQEP to effectively introduce and implement these project activities. In addition, the project design leveraged digital tools to reduce transaction costs in coordination and data collection from the universities. The use of a Project Management Information System (PMIS) helped the Project Management Unit to collect subproject progress reports biannually from more than 300 subprojects under the AIF activities. In addition, the HEMIS system provided a web-based platform for the UGC to collect data from 89 universities on time.

53. The project suffered from some initial delays in the implementation of the AIF and other activities such as improving the strategic planning capacity of the UGC and establishment of the BdREN. This initial delay necessitated the extension of the closing date by 22 months. After the restructuring, the proactive steps taken by the MoE and UGC (as discussed earlier) helped address constraining issues and expedite the implementation of these activities, making up for the initial delays.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

54. **The overall outcome is Satisfactory** based on High rating for relevance, Substantial rating for efficacy, and Substantial rating for efficiency. The project has delivered or overdelivered the majority of



development outcomes and outputs. Considering the ambitious nature of most of the project-supported reform actions, the initial struggle in implementation progress and a few insignificant missed targets do not dampen the achievement of development outcomes of the project.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Institutional Strengthening

55. **The HEQEP helped introduce important institutional capacities both at the level of the UGC and the MoE and for universities as well.** The UGC's capacities were strengthened for FM, procurement, and managing the BdREN. The AIF was established as a competitive funding organization and related capacities were established for most universities. Bangladesh higher education's QA system was strengthened by creating the IQACs. Furthermore, capacity of the UGC/MoE and universities was strengthened by the project through the following activities:

- UGC and MoE
 - Capacity for strategic planning and policy formulation through development of the higher education sector strategic plan and commissioning of a number of studies such as admission policy, tracer study, and satisfaction surveys
 - Capacity for QA through establishment of a QAU at the UGC which helped develop the BAC Act and manage IQAC subprojects
- Universities and their faculty
 - Development of proposals, proposal evaluation as peer reviewers/proposal evaluation panels
 - Introduction of QA and self-assessment culture
 - Improvement of the project management capacity of universities and faculty members by AIF subprojects, which led to the strengthening of accountability mechanism

Mobilizing Private Sector Financing

56. The project mobilized private sector financing through university-industry research collaboration. The AIF Window 4 for funding industry-research collaboration had a mechanism to mandate the contribution of industry partners through financial and in-kind contributions such as human resources and equipment.

Poverty Reduction and Shared Prosperity

57. **The project was designed with the recognition from the Poverty Reduction Strategy Paper (PRSP) 2005 that higher education lacked the relevance to reduce high unemployment and underemployment among graduates.** The GoB aimed to improve the quality of higher education and research in areas such as ICT and biotechnology, which was viewed as key to economic growth. Apart



from the goal of the project’s objective to improve the quality and relevance of higher education, the project did not specifically target disadvantaged students. However, the economic and financial analysis calculated a 15 percent wage increase with the project’s impact—a conservative estimate that accounts for economic uncertainty in the future. While disadvantaged students were not targeted by design, those students attaining higher education will see a greater return on their future potential wages than without the project intervention.

Transformation of Culture, Attitude, and Mindset in Higher Education Sector

58. It is noteworthy that the culture and mindset of higher education stakeholders in Bangladesh went through significant transformation in terms of research and QA. The research grants not only provided the necessary resources for researchers to purchase lab equipment but also changed institutional attitudes toward research and its purpose. The fact that university professors now think about and are concerned about intellectual property rights issues and see patenting as a real possibility, represents a sea change in how both individual faculty members and university administrators today think about research. Moreover, the introduction of QA mechanisms through the AF too has resulted in significant changes in attitude toward QA centrally and at the institution level. The majority of participating universities have all established these cells and staffed them, and as of the final year, the resources needed to support these structures are derived from the national budget.

Gender

59. The HEQEP address some aspects of gender especially through reducing knowledge gaps on the outcomes of female university graduates.¹² The HEQEP was given credit for incorporating gender into the Results Framework and in reporting gender outcomes in the analytical studies conducted. Under the HEQEP, around 35 percent of beneficiaries were female students and teachers (around 119,000 females) who benefited from AIF or BdREN activities, also surpassing the project target of female beneficiaries of 28.5 percent. Additionally, the various studies conducted under the HEQEP, including the satisfaction survey and the graduate tracer study reported gender-disaggregated results. The university graduate tracer study for the first time provided insights on the employability and job market outcomes of female graduates, which has been critical to inform steps needed to improve their employability and inform the follow-up operation in higher education.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

60. **The HEQEP was designed with well-aligned objectives and a well-informed choice of interventions to support.** The project was built out of the US\$100 million provided to higher education under the FY2006–FY2009 CAS that noted the need to develop a clear overall strategy for the future of the system, which includes both public and private universities and a strategy for the long-term public and private funding of higher education. The design of the project was in synergy with the MoE’s Strategic

¹² No gender review was conducted at the time of approval of the original project. However, during the AF in FY2014, the project was assessed as gender informed, meaning preparation of the HEQEP included analysis conducted on gender parity in the sector.



Plan for Higher Education 2006–2016, which ensured the Government’s commitment to pursue activities and reforms aimed at enhancing the quality of teaching, learning, and research in higher education.

61. **Appropriate choice of lending instrument.** The selection of Investment Project Financing (IPF) (then known as a Sector Investment Loan) to finance the HEQEP using an IDA credit was deemed appropriate during preparation because of the Government’s determination to support the implementation of the Strategic Plan and its commitment to accelerate reforms in the higher education sector which prompted readiness for a project in the sector rather than extensive policy reform. A Development Policy Credit was considered but abandoned as an IPF was deemed better suited to a project designed around piloting innovations in the higher education sector. The proposed operation will select initiatives with the potential to revamp universities’ quality, relevance, and governance. As previously stated, the project was designed as a deliberately low reform-intensive project to avoid controversial measures and proceed with implementing the subsector strategy.

B. KEY FACTORS DURING IMPLEMENTATION

62. **While the project was completed satisfactorily, it was beset with issues that required restructuring and proactive management to mitigate.** As noted earlier, this was the World Bank’s first intervention in the higher education sector, and by design, the HEQEP was innovative and focused on significant reforms that are feasible for the political environment during the implementation period to ensure a strong start to World Bank engagement with the higher education sector in Bangladesh. Though the team placed the mitigation measures in design, issues related to capacity of the MoE, UGC, and HEIs were not inadequately mitigated by design alone. Delays in capacity building in UGC and in the HEQEP in hiring planned staff to carry out functions necessary for implementing the AIF and BdREN delayed implementation progress at key junctures. In addition, procurement delays early on within the first year of effectiveness delayed implementation progress. Through proactive restructuring and coordination between the GoB and the World Bank, the project design and implementation were deemed adequately girded for the AF that expanded the project investment to 2.5 times the original loan amount.

63. **As mentioned previously, as early as implementation launch in 2009, the project was beset with procurement issues, beginning with a quickly outdated procurement plan and key procurement items delayed for six months due to the HEQEP’s failure to hire requisite procurement specialists.** Despite issues with the quality of the procurement plan in the first two years of implementation, implementation progressed with moderate satisfaction. However, by the midterm review (MTR), the project faced significant procurement and overall staffing issues, specifically a lack of procurement specialists and necessary staff in the UGC to implement the HEMIS. The BdREN Unit in the UGC faced chronic delays in staffing, thus precluding implementation and capacity building in the unit, and therefore stalling overall implementation of the BdREN, the campus network, and the digital library, threatening the viability of the component altogether. Implementation progress was downgraded to Moderately Unsatisfactory due to the issues above as well as slow institutionalization of the AIF mechanism, weak project leadership, and an unfinalized OM. By the MTR, the World Bank team and Project Implementation Unit (PIU) developed a plan for restructuring, to include adjustments to components in line with agreed actions to improve implementation performance.

64. **The concerted effort to address staffing and procurement issues turned around implementation performance markedly in the period following the MTR.** Addressing these issues contributed to



considerable progress in the AIF subprojects' implementation. With staffing issues addressed following restructuring, the implementation of the BdREN, a component plagued with significant issues for the first three years of implementation showed signs of progress. Delays in reporting aside, the new strong fiduciary teams contributed to a turnaround in implementation performance and progress toward meeting the development objective. Interim assessments and the desire by the GoB and the World Bank team to capitalize on the potential for a successful first intervention in the sector prompted a call for an AF, which was prepared and approved in 2013.

65. **Despite commendable action to set the HEQEP on the right path, the second half of implementation was not without problems as elections and political unrest slowed implementation, particularly affecting procurement processes.** Gains made in FM were negatively affected by delayed, inaccurate, and ineligible financial reporting in the year following restructuring and the AF. Delays and lack of documentation led to a downgrade in M&E progress as well. Issues related to ineligible expenditures, a resurfacing of hiring needs, and a slowdown in field-level fiduciary support threatened progress made since restructuring and the AF. Though fiduciary issues were never fully mitigated, they were addressed and implementation progress on the AIF and BdREN proceeded satisfactorily until project closure, efficiently satisfying the PDO.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

66. **The project's M&E was straightforward and well defined.** The M&E was designed to monitor and provide a means of reporting on progress toward meeting the PDO and the intermediate results indicators in the Results Framework and tracking implementation progress. Key to M&E in the project design was the design of the MEU to support planning, monitoring, and evaluation of the performance of the project and the sector beyond project implementation. The MEU was developed to collect, process, and disseminate data related to HEQEP implementation. Substantively, the MEU was tasked to prepare monitoring reports on the HEQEP, conduct validation surveys on AIF-financed projects, and conduct the satisfaction and tracers studies, which were integral to monitoring progress toward and outcomes of the PDO. The PMIS was developed to store and aid in the processing of HEQEP data. In addition, M&E staff were hired in the UGC and the HEQEP to use HEMIS and other means to measure progress toward the PDO and intermediate indicators.

67. **The Results Framework was proactively revised at each instance of restructuring to enable better measurement of achievement of project outcome and output.** As mentioned earlier, at the time of restructuring in January 2013, PDO indicator 2 was considered immeasurable without a budget head for competitive funding. PDO indicator 3 'Number of universities (public and private) connected to BdREN' was revised to better measure the target and subsequently moved to the intermediate outcome level because it was found to be a more appropriate measurement of outcome by design. It was replaced by PDO indicator 3 'Monthly average volume of inbound education/research data traffic in BdREN' to better monitor the outcomes of the BdREN.



M&E Implementation

68. **Throughout implementation, the PDO results indicators and the intermediate results indicators were systematically measured and reported.** The MEU under the HEQEP was responsible for designing, organizing, and managing the M&E activities during implementation of the project. The M&E has provided regular and timely progress reports on component-wise activity on a semiannual basis. The MEU produced 17 semiannual synthesis reports that discussed in detail the project progress, implementation issues, and possible solutions. These reports also updated on critical areas of World Bank monitoring requirements including compliance with environmental and social safeguards, citizen engagement, and governance and accountability status. The Results Framework was updated regularly and included in the semiannual progress reporting by the MEU.

69. The reporting was supported through the PMIS, developed under the HEQEP to support subproject coordination and field-level data collection. Based on PMIS template, data were collected biannually for 300+ subprojects across different universities, which fed into the consolidated Project Semiannual Progress Reports. By 2018, the MEU arranged the PMIS workshop for 342 participants and conducted training for 68 participants comprising supporting staff and entrepreneurs.

70. The MEU also conducted six studies to evaluate and assess the project activities, while contributing to knowledge generation in the sector. These studies include (a) three rounds of satisfaction surveys, (b) a project interim impact assessment, (c) the first university graduate tracer study, and (d) a project impact assessment, including study on effectiveness of Window 4 AIF subprojects. These evaluations were conducted by third-party research firms that ensured the reliability of the data and findings. Intermediate indicator 12 specifically tracked implementation of all the surveys and studies by the MEU. The project overachieved on that indicator by completing six studies against the target of five studies.

71. In addition to the changes in the Results Framework deemed necessary during the two rounds of restructuring, there were changes to the collection and reporting of data that were addressed during restructuring. The HEMIS was designed to collect, store, process, and disseminate data related to education management and academics including aspects of student performance, curricula, lectures, alumni, academic staff, students' social affairs, and so on. The HEMIS system, designed to be implemented as part of UGC capacity building and data collection, was to have two components: the National-HEMIS and University-HEMIS to be developed at selected universities. However, by the time of restructuring in January 2013, delays in progress due to lacking capacity earlier in implementation led to the University-HEMIS being dropped, leaving only the National-HEMIS as the repository for HEQEP-relevant data.

M&E Utilization

72. **Utilization of M&E data and reporting was actively pursued to inform project and sector strategy and operations during the implementation.** The MEU handled M&E of all project activities and for the preparation and dissemination of semiannual monitoring reports on the whole project, conducting a 20 percent validation survey on the AIF subprojects. The 17 semiannual reports were submitted regularly and timely before each implementation support mission which helped focus the discussion between the MoE and World Bank on key implementation challenges and possible solutions. The MEU also produced midterm reports under both the original financing and the AF, which facilitated the discussions and



decision making on next steps of the project operations. Additionally, the studies and evaluations conducted also informed the MoE's current Strategic Plan for Higher Education 2018–2030 and also the design of the next higher education operation in the sector.

73. At the sector level, a National-HEMIS was developed under the project to support annual reporting of the status of universities on various areas of interest (such as student enrollments and seat capacity, teacher numbers, research publications, and budgeting). The data from the HEMIS were used to produce annual reports and were published on the HEMIS and UGC website.

74. As noted previously, the project supported sector M&E through a university-level HEMIS to be implemented in each participating institution, but lack of capacity called for reoriented priorities. This and the notable revisions to the Results Framework hampered the utilization of the M&E system and processes earlier in the implementation period. Adjustments at restructuring corrected lingering concerns and fostered a strong M&E system throughout the remaining life of the project.

Justification of Overall Rating of Quality of M&E

75. **The overall rating for M&E is Substantial.** The project has effectively implemented its M&E plan and used monitoring information for project management. It produced several effectiveness assessments covering key project activities and undertook important studies targeting students and graduates through satisfaction surveys and graduate tracer studies which were the first such attempts in Bangladesh's higher education sector. At the same time, there is still some way to go to strengthen the M&E capacity of the higher education system. For instance, the UGC's HEMIS still needs improvement especially for allowing dynamic reporting mechanism. Monitoring of research activities through bibliometric studies would have been excellent knowledge to inform future efforts for strengthening research and innovation. Graduate tracking surveys, though undertaken once, would need to be regularized. Considering these potentially achievable M&E capacity enhancement actions under the project, the quality of M&E is rated Substantial.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

76. **Environment and social safeguards.** The project was rated Category B. The project did not require land acquisition, cause the displacement of people (regardless of title to land) from private or public lands, or have any adverse impacts on livelihoods. As such OP 4.12 Involuntary Resettlement was not triggered. A social assessment during appraisal concluded that the project interventions will have positive impacts on stakeholders of higher education including any ethnic minority groups in Bangladesh who may be beneficiaries of the project. Based on this finding OP 4.10 Indigenous Peoples was triggered for the project and a Social Management Framework had been prepared.

77. At the time of restructuring in December 2013, the environmental safeguards were rated 'satisfactory' based on the due diligence demonstrated by the implementing agency in the previous year of environmental safeguard implementation. Due to the potential environmental impacts from relatively limited scale and magnitude of the infrastructure renovation/refurbishing/extension works and academic research output, the project retained its Category B for the AF.

78. **FM.** Through the life of the project, FM performance transited between Satisfactory and Moderately Satisfactory, with a few instances of downgrading to Moderately Unsatisfactory. After the



first round of restructuring, inconsistencies in expenditure reporting prompted the downgrade in FM from Satisfactory to Moderately Satisfactory. In 2014, the year following restructuring and the AF, delays in submitting acceptable and accurate **internal unaudited financial reports**, ineligible expenditures, unresolved auditing observations, and delays in hiring auditor staff and an FM analyst prompted the first downgrade from Moderately Satisfactory to Moderately Unsatisfactory. The following year, FM was downgraded to Moderately Unsatisfactory again after setbacks in the preceding issues (which had been upgraded from Moderately Unsatisfactory to Moderately Satisfactory). Staffing of FM specialists both at the project and within the QAU continued to face delays. By 2017 and as project closure neared, FM issues had largely been addressed. However, delays and incomplete data that plagued the project since the first downgrade remained, albeit with close monitoring and eventual delivery of agreed products. These issues improved until project closure, which prompted a Moderately Satisfactory for FM over the final year and half of the implementation period.

79. **Procurement.** Procurement was rated Moderately Satisfactory throughout much of the period of project implementation. From the first supervision mission, procurement was downgraded from the default Satisfactory to Moderately Satisfactory due to scheduled procurement actions up to that time being delayed by six months. In addition, a procurement officer had yet to be hired. Procurement delays continued to hamper implementation but progressed sufficiently to remain Moderately Satisfactory. However, by 2015, mass protests and blockades had affected procurement processes for the implementation of the AIF subprojects. The political unrest had also delayed procurement necessary for implementing BdREN infrastructure. These developments prompted a downgrade to Moderately Unsatisfactory in the 12th mission in June 2015. As agreed with the HEQEP, actions were taken to build capacity in the procurement team to address these issues, including strengthening inventory management, streamlining BdREN connectivity under central procurement, and taking prompt actions on procurement plans. The actions taken in the period following prompted an upgrade in rating to Moderately Satisfactory that remained until project closure.

C. BANK PERFORMANCE

Quality at Entry

80. **At the time of appraisal, the team worked closely with the GoB to ensure alignment with Bangladesh's PRSP¹³ and FY2006–FY2009 CAS.¹⁴** The design of the operation was straightforward and focused on improving the quality of higher education through innovation to utilize scarce resources in the sector to better prepare students and HEIs to meet the needs of a globalized economy. The project was designed to be strategically relevant, referring directly to the pillars of Bangladesh's development strategy. Project design was deliberately selective about the initial set of reforms and to build capacity within the sector so that the project will build the foundation for reforms to revamp the higher education sector in the medium and longer term. Key social and environmental aspects of design were clear and without issue during implementation. Fiduciary aspects and implementation arrangements, including M&E, were prepared such that significant issues did not arise during implementation due to design limitations but due to issues of capacity beyond capacity-building arrangements. Risk assessment was

¹³ Government of People's Republic of Bangladesh. 2005. "Unlocking the Potential: National Strategy for Accelerated Poverty Reduction."

¹⁴ World Bank. 2006. *Country Assistance Strategy for the People's Republic of Bangladesh - FY06-09*. Report No. 35193



candid at appraisal, noting capacity risk, with mitigation measures put in place to address them accordingly. Thus, the rating for quality at entry is **Satisfactory**.

Quality of Supervision

81. **The quality of supervision was rated Satisfactory.** There were 18 World Bank review and implementation support missions conducted from December 2009 to December 2018. Furthermore, there was a strong and effective presence of the country-based team for daily implementation support and guidance. The World Bank team comprised a good mix of skills and expertise with the co-TTL based in Dhaka, which provided active and timely support to the HEQEPU as it implemented the project. Supervision missions were conducted twice each calendar year, including two dedicated MTR support missions in 2012 and 2016. As noted earlier, from the very first support mission, the World Bank team recognized impediments to implementation progress and actively engaged with the HEQEPU to develop action plans and time lines. In almost every case in which a set of issues were identified during the support mission, there was improvement in mitigating issues by the following mission. Following each support mission, the World Bank team prepared Aide Memoires noting changes in project performance ratings, progress toward PDOs and implementation progress, as well as updates on fiduciary and M&E. Component-level status updates were featured in every Aide Memoire, each ending in a detailed summary of agreed-upon actions for the implementing units. Agreed actions were then closely followed up and assisted by the country-based World Bank team members including a dedicated consultant who provided effective and consistent day-to-day operational support and technical assistance. Implementation Status and Results Reports (ISRs) were also prepared summarizing performance ratings and implementation status and key decisions undertaken. These materials informed the preparation of the ICR, providing a repository of knowledge from which to map out the life of the project, to assess quality of decision and design, and upon which to draw lessons and develop recommendations.

82. **As referenced previously, procurement and FM issues cropped up and contributed most to risks to implementation progress and even to achieving development objectives at certain points during the project's life.** The World Bank team and the HEQEPU developed action plans to address each item and the World Bank team supported the implementation units to improve capacity as needed in areas of weakness. A detailed MTR led to an interim assessment and two restructurings to concurrently course correct and build upon positive developments. Unforeseen circumstances such as political unrest and chronic fiduciary issues threatened implementation progress and were addressed by the HEQEPU with support from the World Bank team.

Justification of Overall Rating of Bank Performance

83. **The World Bank's performance was Satisfactory.** Based on the review of quality at entry, quality of supervision, and the World Bank's proactiveness in initiation of the two restructurings, the World Bank's performance was satisfactory.

D. RISK TO DEVELOPMENT OUTCOME

84. **The risk to sustaining the development outcome is low based on the significant large number of products, facilities, and services that may be threatened without the auspices of active implementation of a discreet project.** A significant budget is needed for sustained and sustainable use of



the services and products innovated by the HEQEP. As noted previously, the HEQEP prepared a sustainability plan to ensure sustainable support of the products/results of the project and a necessary provision was incorporated into the sustainability plan. On behalf of the UGC, the HEQEP prepared a strategic plan related to sustainability of all project initiatives (short term, medium term, and long term) and appropriate budget allocation was set to make HEQEP results (output, products, goods, and services) sustainable. The significant capacity-building efforts throughout the life of the project represent the extent to which the HEQEP invested in the MoE and the recipient institutions to sustain and build upon the results of the project. A financial arrangement for sustaining key activities of the project has been put in place. An endowment fund of BDT 80 crore (US\$10 million) has been released to the BdREN Trust. Another set of endowment fund is set aside for the BAC. The UGC created a dedicated budget line for IQAC activities at public universities. Every AIF subproject had included a sustainability plan for maintenance of their equipment and facilities as necessary.

85. A number of factors do collectively reduce the risk that the development outcomes may not be sustained. As the HEQEP drew to a close in December 2018, the Chairman of the UGC created the BdREN Trust of 11 members consisting of representatives from higher education, UGC, MoE, and others to continue operation and maintain the BdREN. In terms of the QA mechanisms innovated by the project, the BAC Act 2017 was passed on March 7, 2017, created an undergirding legal framework for accreditation and QA across all HEIs in Bangladesh. Learning from the experience with capacity and technical expertise issues in the UGC during the implementation of the HEQEP, the new Higher Education Acceleration and Transformation Project (HEAT) (P168961) currently under preparation will be designed to adequately fill personnel needs based on clearly-defined terms of references. In addition, training will be available to the UGC, other implementing partners, and national universities as soon as practical, to close gaps in expertise and to ensure effective implementation of subprojects.

V. LESSONS LEARNED AND RECOMMENDATIONS

Lesson 1: Invest in higher education

Recommendation

- (a) The HEQEP revealed significant untapped potential of research capacity in the country. As the project's high efficiency demonstrates, interventions in higher education can have a significant impact on wage growth among other positive returns on education.
- (b) Undertake substantial investment for introducing blended online programs to match with the global trends of higher education.

Lesson 2: Transparent and rigorous peer review-based screening and selection process for awarding of competitive grants improves legitimacy and sustainability of the process

Recommendation

- (a) Broaden and deepen the use of the competitive grant system for a range of institution-based improvement activities, while maintaining the rigorous peer review process.



- (b) Strengthen the central capacity for progress monitoring and results accountability of grant-supported activities by introducing a functioning PMIS.

Lesson 3: Ensure capacity building to ensure lasting gains attributable to project

Recommendation

- (a) Invest in substantial capacity development for establishing an institutional QA system and development of quality culture.
- (b) Link gains in research environment and attract talent by investing in capacity development for intellectual property among academics.
- (c) Rigorously review sustainability plan for grant-supported subprojects after project completion, which can guide implementation and ensure an enabling environment going forward.
- (d) Employ tracer studies to track project achievement and measure knowledge gains.

Lesson 4: Competitive grants instill autonomy in HEIs

Recommendation

- (a) Provide effectiveness and versatility of competitive grant mechanism in supporting autonomous HEIs, which can make a difference in grant success.

Lesson 5: Strong project implementation mechanisms needed to assure requisite fiduciary capacity

Recommendation

- (a) Build a strong project implementation setup to develop fiduciary capacity of grant beneficiaries and to monitor the implementation of grant-supported projects:
- (b) Provide prudent project design and selectivity of critical reforms for successful implementation of reforms and project activities in the context of a highly politicized higher education sector and the new engagements.



ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: Promoting Academic Innovation

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increased level of satisfaction of students and faculty staff regarding the quality of teaching and research environment, and of employers regarding the relevance of teaching and research programs	Text	Student- 3.3 Faculty - 2.9 Employer - 3.0 31-Mar-2009	Student – 3.6 (10%) Faculty – 3.2 (10%) Employer – 3.3 (10%) 30-Oct-2015	Student - 4.0 (21%) Faculty - 4.0 (38%) Employer - 4.2 (40%) 31-Dec-2018	Student - 3.7 (12%) Faculty - 4.0 (38%) Employer - 4.1 (37%) 31-Dec-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of academic publications produced by beneficiaries of AIF subprojects	Number	65.00 30-Nov-2013	150.00 31-Dec-2018		778.00 31-Dec-2018



Comments (achievements against targets):

Objective/Outcome: Building Institutional Capacity

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
All research and teaching and learning funds under UGC are distributed using an identified set of rules based on transparency and competition	Text	Funding is not competitive 31-Mar-2009	Revamped competitive funding mechanism implemented. 31-Dec-2018		Revamped competitive funding mechanism implemented. 31-Dec-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	30000.00 30-Nov-2013	47000.00 31-Dec-2018	360000.00 31-Dec-2018	564615.00 31-Dec-2018
Female beneficiaries	Percentage	28.50	28.50 30-Jun-2018		35.00

Comments (achievements against targets):

Objective/Outcome: Raising Connectivity in Higher Education Sector



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Monthly average volume of inbound education/ research data traffic in BdREN	Text	10 TB 30-Nov-2013	100 TB 31-Dec-2018		1,362 TB 31-Dec-2018
Comments (achievements against targets):					

Objective/Outcome: Establishing Quality Assurance Mechanisms

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of IQAC established and produce self-assessment based on the established framework	Number	0.00 30-Nov-2013	15.00 31-Dec-2018		69.00 31-Dec-2018
Comments (achievements against targets):					

A.2 Intermediate Results Indicators**Component:** Component 1: Promoting Academic Innovation

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Teaching and Learning Percentage of fund	Text	Round 1: 0, Round 2:0, Round 3: 0	Round 1: 100%		Round 1: 100%



utilization by teaching and learning sub-projects (Window 1): (i) Round 1, (ii) Round 2, (iii)Round 3		31-Mar-2009	Round 2: 100% Round 3: 100%		Round 2: 100% Round 3: 100%
			31-Dec-2018		31-Dec-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Percentage of fund utilization by research sub-projects (Window 2): (i) Round 1, (ii) Round 2, (iii) Round 3	Text	Round 1: 0, Round 2:0, Round 3: 0 31-Mar-2009	Round 1: 100% Round 2: 100% Round 3: 100% 31-Dec-2018		Round 1: 100% Round 2: 100% Round 3: 100% 31-Dec-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Percentage increase (cumulative) in doctoral level enrollment [%] under AIF sub-projects	Percentage	0.00 31-Mar-2009	15.00 30-Oct-2015	100.00 31-Dec-2018	368.00 31-Dec-2018

Comments (achievements against targets):



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Percentage of 39 eligible universities completed at least one self-assessment sub-project [%]	Percentage	0.00	50.00		126.00
		31-Mar-2009	31-Dec-2018		31-Dec-2018
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
The mechanism for university-industry collaboration piloted and evaluated	Text	The mechanism for university-industry collaboration does not exist.	A study conducted to assess the effectiveness of W4		Assessment study was conducted
		30-Nov-2013	03-Dec-2018		31-Dec-2018
Comments (achievements against targets):					

Component: Component 2: Building Institutional Capacity

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
National HEMIS is in place and operational at UGC	Text	National HEMIS does not exist.	Annual Statistical Report published		6th Annual Statistical Report was published



		31-Mar-2009	31-Dec-2018		31-Dec-2018
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Proportion of institutions covered under awareness campaign [%]	Percentage	0.00 31-Mar-2009	100.00 31-Dec-2018		100.00 31-Dec-2018
Comments (achievements against targets):					

Component: Component 3: Raising the Connectivity Capacity of the Higher Education Sector

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of universities (public and private) connected to BdREN	Number	0.00 31-Mar-2009	60.00 31-Dec-2018		40.00 31-Dec-2018
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number ('000) of online	Number	0.00	37.00		24.30



journal title accessed and downloaded using UGC Digital Library on average per month)		31-Mar-2009	31-Dec-2018		31-Dec-2018
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Comments (achievements against targets):

Component: Component 4: Establishing Quality Assurance Mechanism

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
QA Unit is fully functional and operational	Text	No QA unit exists 31-Mar-2009	QA Unit established, and draft Qualification Framework finalized, and QA docs finalized 31-Dec-2018		QA Unit established, and draft Qualification Framework finalized, and QA docs finalized 31-Dec-2018

Comments (achievements against targets):

Component: Component 5: Project Management, Communication, Monitoring and Evaluation

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
HEQEP Unit is fully functional and operational	Text	0 31-Mar-2009	1 31-Dec-2018		1 31-Dec-2018



Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Completion of baseline survey, follow-up survey at mid-term and end-line survey	Number	0.00 31-Mar-2009	3.00 30-Oct-2015	5.00 31-Dec-2018	6.00 31-Dec-2018

Comments (achievements against targets):



B. KEY OUTPUTS

Improve the quality and relevance of teaching in HEIs	
Outcome Indicators	<ol style="list-style-type: none"> 1. Increased level of satisfaction of students and faculty staff regarding the quality of teaching and research environment, and of employers regarding the relevance of teaching and research programs: (a) Student Satisfaction Surveys; (b) Faculty Satisfaction Survey; (c) Employer Satisfaction Surveys 2. All research and teaching and learning funds under UGC are distributed using an identified set of rules based on transparency and competition 3. Direct project beneficiaries, of which female beneficiaries 4. Monthly average volume of inbound education/research data traffic in BdREN 5. Number of IQAC established and produce self-assessment based on the established framework
Intermediate Results Indicators	<ol style="list-style-type: none"> 1. Teaching and Learning: Percentage of fund utilization by teaching and learning subprojects (Window 1). 2. The mechanism for university-industry collaboration piloted and evaluated. 3. Number ('000) of online journal titles accessed and downloaded using UGC Digital Library on average per month 4. Percentage of 39 eligible universities completed at least one self-assessment subproject 5. National HEMIS is in place and operational at UGC. 6. Proportion of institutions covered under awareness campaign (%) 7. Number of universities (public and private) connected to BdREN 8. QA Unit is fully functional and operational 9. HEQEP Unit is fully functional and operational



	10. Completion of baseline survey, follow-up survey at mid-term and end-line survey, and tracer studies
Key Outputs (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none">1. 27,051 students and staff have received training2. 15,350 IT equipment procured/installed in 38 universities3. 2,955 office equipment added to universities4. 41,184 books and journals have been procured for offices/libraries5. 1,653 classrooms/labs/offices renovated and furnished6. 41,184 books and journals added to libraries7. 12,012 faculty have received training on various disciplines8. 618 master’s program student enrolled in the subprojects9. 9 libraries modernized and automated with modern library management software10. 517 faculty have received training from national and international universities11. 103 curricula updated
Improve the research environment in HEIs	
Outcome Indicators	<ol style="list-style-type: none">1. Number of academic publications produced by beneficiaries of AIF subprojects2. Increased level of satisfaction of students and faculty staff regarding the quality of teaching and research environment, and of employers regarding the relevance of teaching and research programs: (a) Student Satisfaction Surveys; (b) Faculty Satisfaction Survey; (c) Employer Satisfaction Surveys3. All research and teaching and learning funds under UGC are distributed using an identified set of rules based on transparency and competition4. Direct project beneficiaries, of which female beneficiaries5. Monthly average volume of inbound education/research data traffic in BdREN



	<p>6. Number of IQAC established and produce self-assessment based on the established framework</p>
<p>Intermediate Results Indicators</p>	<ol style="list-style-type: none">1. Percentage of fund utilization by research subprojects (Window 2)2. Percentage increase (cumulative) in doctoral level enrollment (%) under AIF subprojects3. Percentage of 39 eligible universities completed at least one self-assessment subproject4. National HEMIS is in place and operational at UGC5. Proportion of institutions covered under awareness campaign6. Number of universities (public and private) connected to BdREN7. QA Unit is fully functional and operational8. HEQEP Unit is fully functional and operational9. Completion of baseline survey, follow-up survey at mid-term and end-line survey, and tracer studies
<p>Key Outputs (linked to the achievement of the Objective/Outcome 2)</p>	<ol style="list-style-type: none">1. 13,494 lab equipment have been procured2. 170 PhD students enrolled3. 819 articles published in peer-reviewed journals4. 181 papers have been published on conference proceedings5. 200 instances of collaboration opportunities have been established



ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Benoit Millot	Lead Education Specialist (co-TTL)
Subrata Dhar	Senior Operations Officer (co-TTL)
Yoko Nagashima	Education Specialist
Syed Rashed Al-Zayed	Research Analyst
Mokhlesur Rahman	Team Member
Burhanuddin Ahmed	FM Specialist
Marghoob Bin Hussein	Procurement Specialist
Sachiko Kataoka	Education Economist
Lianqin Wang	Education Specialist
Michael Foley	Team Member
Tenzin Dolma Norbhu	ICT Specialist
Shakil Ahmed Ferdausi	Environmental Specialist
Fabio Pittaluga	Social Development Specialist
Kishor Uprety	Senior Counsel
Vikram Raghavan	Senior Counsel
Chau-Ching Shen	Financial Officer
Nazma Sultana	Team Member
Bertha Mburugu	Team Member
Ricardo Reich	Team Member
Hena Mukherjee	Team Member
Nusrat Jahan	Team Member
Hon Chan Chai	Team Member
Supervision/ICR	
Mokhlesur Rahman, Shiro Nakata	Task Team Leader(s)
Arafat Istiaque, Ishtiak Siddique	Procurement Specialist(s)
Mohammad Reaz Uddin Chowdhury	FM Specialist
Nazma Sultana	Team Member
Yoko Nagashima	Team Member



Name	Role
Muhammad Asahabur Rahman	Team Member
Sabah Moyeen	Social Safeguards Specialist
Nadia Sharmin	Environmental Safeguards Specialist
Tashmina Rahman	Team Member
Shourov Kumar Sharma	Team Member
Rex Joseph Quiah	Team Member

1. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
Preparation		
FY07	0	4,567.28
FY08	67.782	383,319.20
FY09	71.057	330,952.43
FY10	0	44.28
Total	138.84	718,883.19
Supervision/ICR		
FY09	8.400	62,809.06
FY10	46.948	292,992.60
FY11	59.280	288,285.81
FY12	76.467	494,850.42
FY13	83.815	571,427.36
FY14	35.950	114,379.84
FY15	39.548	164,243.05
FY16	2.649	57,986.51
FY17	9.523	95,515.34
FY18	26.304	135,559.04



FY19	30.544	163,715.87
Total	419.43	2,441,764.90



ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US\$, millions)	Actual at Project Closing (US\$, millions)	Percentage of Approval
Promoting Academic Innovation	48.10	116.12	241.4
Building Institutional Capacity	4.10	6.8	165.9
Raising the Connectivity Capacity of the Higher Education Sector	26.50	45.91	173.2
Establishment of Quality Assurance Mechanism at the Institutional Level	0	15.83	.
Project Management, Communication, and Monitoring and Evaluation	2.3	16.43	714.2
Total	81.00	201	248



ANNEX 4. EFFICIENCY ANALYSIS

1. The economic analysis presents detailed costs and benefits accrued from the project so that a comprehensive cost-benefit analysis (consideration of all major costs and benefits) and IRR (the interest rate at which net present values of both costs and benefits are equal to zero) can be undertaken. Sensitivity analysis, where changes in the underlying parameters (such as changes in the number of beneficiaries and quality enhancement of education as a result of the HEQEP) affect anticipated outcomes, is also done. This economic analysis of the HEQEP assesses ex post costs and benefits associated with the program. The methodology outlined below explains how the ex post estimation of benefits and costs accrued from the HEQEP should be viewed against a counterfactual where the GoB would continue without support from IDA.

2. To the extent possible, the approach and assumptions made during the ex ante economic analyses in 2009 and 2013 are largely followed here. For example, the economic analysis does not assess realized benefits and costs related to the program using a 'counterfactual' identification approach where the additional cost is compared with the additional benefits accrued from the HEQEP, which is done in many IDA-funded projects, because the earlier ex ante economic analysis did not use that approach. In cases where the assumptions are different from ex ante analyses, the assumptions are explicitly highlighted.

Benefits

3. The assumptions made on benefits are described in this section.

4. **Benefits coverage.** During the project preparation phase, it was assumed that all public universities and 40 percent of private universities will be eligible for the HEQEP, and that the proportion of eligible total university graduates benefiting from the project were estimated to be 20 percent. These assumptions are maintained here as well.

5. **Wage premium.** Wage premiums refer to the additional benefits for all HEQEP graduates during the project phase. Because the quality of education is assumed to have been enhanced by the exposure to the HEQEP, it is expected that the labor market has absorbed the skill improvement of HEQEP graduates and the wage rate increased as a result. The wage differential in the presence of the HEQEP was assumed to be 10 percent higher than in the absence of the HEQEP during the initial program preparation, but was increased to 15 percent during the AF phase partly because, in the Enterprise Skills Survey conducted in 2012 by the World Bank, the wage differential in the entry-level salaries between those who secured first division (highest performing group) and those who secured second division (second highest performing group) in the examinations for university graduates was 20 percent. In this analysis, the conservative 10 percent was used during the original phase. The sensitivity analysis below will delve further into this assumption.

6. **Enrollment growth projection.** Though not exactly an assumption for this ex post economic analysis as such, the enrollment growth projections during the original phase and AF phase were important considerations that were made as the benefits depended greatly on enrollment figures. In the original phase, the enrollment growth rate projection was assumed to be 2–3.5 percent while it was increased to 5.21 percent during the AF phase. The actual average enrollment rate was much higher than 5.21 percent, the implications of which will be discussed below.



Costs

7. There are two costs to consider: IDA funding and GoB counterpart funding, which also includes contributions from the participating private universities. The total project cost was US\$238.1 million, US\$206 million of which was from IDA and US\$32.1 million was from the GoB.

8. A discount rate of 12 percent is used in this analysis to find the present value of future costs and benefits. This is consistent with the findings of World Bank (2016), which suggests that many researchers recommend discount rates between 8 percent and 12 percent for developing countries. Since the higher the discount rate, the lower the present value of the future earnings, a higher discount rate is used so that our benefits assumption is on the conservative side.

Economic rate of return

9. Using the above assumptions, the cost-benefit analysis shows that the present value of net benefits is positive (US\$728 million), and that the program’s IRR is 52.8 percent, which is significantly higher than the discount rate (12 percent). Though this IRR is high, this could be interpreted as a lower bound estimate, as positive externalities associated with enhanced education quality and equity arising from a healthier, better educated and equitable/inclusive society have not been included in the analysis. In addition, increased enrollment caused by improved higher education quality and less dropouts or quicker graduation are not factored in the calculation.

10. The ex ante economic analysis conducted during the original phase estimated the IRR to be 17.9 percent while it was updated to 20.8 percent during the AF phase where assumptions on enrollment growth rate and wage increase were modified (World Bank 2013). Had they not updated these parameters, the estimated IRR would have been 49.1 percent without the AF and 69.9 percent with the AF.

11. This unusually high IRR is partly also a result of significantly higher wage rates for those with higher education. The annual wages by education level from 2005, 2010, and 2016 are provided in table 4.1. It shows that the average annual wage for workers with higher education was 51 percent higher than wages for workers with secondary education completion in 2010. This figure increased to 55 percent in 2016.

Table 4.1. Average Annual Wage by Education Level

Education Level	2005	2010	2016
<i>Average annual wage in nominal Taka</i>			
No schooling	22,643	40,979	81,057
Primary level completed	31,588	49,471	101,804
Secondary level completed	67,184	114,839	182,782
Higher education completed	101,482	173,715	284,055
<i>Average annual wage in 2016 Taka</i>			
No schooling	49,815	62,288	81,057
Primary level completed	69,494	75,196	101,804
Secondary level completed	147,805	174,555	182,782



Education Level	2005	2010	2016
Higher education completed	223,260	264,047	284,055

Source: Bhatta et al. (2019) based on Household Income Expenditure Survey (HEIS) data.

12. A closely related topic is the returns to higher education which has been consistently high in Bangladesh (World Bank 2018). The rate of returns to an additional year of education in different levels for years 2005, 2010, and 2016 are provided in table 4.2. It shows that rate of returns to additional years in primary and secondary levels are decreasing over time, but the rate of returns to higher-level education has been consistently over 20 percent in 2005, 2010, and 2016. The finding on returns to higher education being the highest is also consistent with the estimates in Montenegro and Patrinos (2014) that compared returns to schooling globally.

Table 4.2. Rate of Return to Additional Year of Education at Different Levels in Bangladesh

Level	2005 (%)	2010 (%)	2016 (%)
Primary (Grades 1–5)	7.5	5.5	4.0
Secondary (Grades 6–12)	6.8	5.4	4.6
Higher (Bachelors and above)	20.5	22.8	20.5

Source: World Bank 2018.

13. Another reason for the high IRR is the unexpected large growth in university enrollment during the HEQEP period. For example, the total enrollment in public and private universities was 387,433 in 2009 while this figure jumped to 856,726 in 2017 (BANBEIS 2018). The average increase in enrollment was 11.1 percent between 2009 and 2017, while the ex ante economic analysis expected growth to be half that percentage (5.21 percent) for the AF and 2–3.5 percent during the original program preparation phase.¹⁵

Robustness/Sensitivity Analysis

14. Given the way ex ante economic analysis was conducted, the wage premium and proportion of university students who are beneficiaries play central roles in the calculation of the IRR.¹⁶ As discussed earlier, the base case for the wage premium for all eligible graduates is 10 percent and 20 percent of the eligible university graduates (all public universities and 40 percent of private universities) are eligible. Table 4.3 shows what happens to IRR when wage premium and proportion of beneficiaries are changed.

Table 4.3. Sensitivity Analysis for the Cost-Benefit Analysis for the HEQEP

		Wage Increase/Premium		
		Low (5%)	Base (10%)	High (15%)
Beneficiaries	Low (10%)	20.4%	33.7%	44.1%
	Base (20%)	33.2%	52.8%	66.5%
	High (25%)	39.2%	60.5%	77.0%

15. The IRR is as low as 20.4 percent and as high as 77.0 percent when certain parameters are

¹⁵ The growth rate in enrollments has decreased significantly since 2014 though; the enrollment rate has increased by 5.7 percent from 2014 onwards, while it was 20.7 percent before that.

¹⁶ The wage rate of university graduates and university enrollments also play major roles in IRR, but these figures are calculated using actual figures.



changed. For example, when the wage premium decreases to 5 percent and proportion of beneficiaries are assumed unchanged, the IRR decreases to 33.2 percent. If the wage premium decreases to 5 percent and proportion of beneficiaries also decreases to 10 percent, the IRR is 20.4 percent. On the other hand, when both the wage premium is increased to 15 percent and the proportion of beneficiaries is increased to 25 percent, the IRR would increase to 77.0 percent. It can be said that because the enrollment increased drastically during the HEQEP period, the wage increase may have been lower (5 percent). In that case, the IRR is 33.2 percent.

Conclusion

16. The economic analysis suggests that the HEQEP was, ex post, a sound investment decision. The cost-benefit analysis shows that the present value of net benefits is positive (US\$728 million), and that the program's IRR is 52.8 percent, which is higher than the discount rate. The major driving force for this high IRR is the huge increase in the enrollment rates for higher education, the much higher wage rate obtained by university graduates, and the quality premium assumed for those exposed to the HEQEP.

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ANNEX 5. BORROWER'S COMMENTS & SUMMARY OF BORROWER'S ICR

BORROWER'S COMMENTS ON THE BANK ICR

UGC Response to HEQEP ICR

Dear Mr. Shiro Nakata and Mr. Mokhlesur Rahman,

Many thanks to World Bank Education Team for sharing the HEQEP ICR. I am immensely pleased to see the excellent documentation of the background, inception, implementation, and achievements of the project. I am also impressed to know the remarkable impact the project has created in the higher education sector of Bangladesh. Response of UGC with regard to HEQEP ICR is reflected in the following paragraphs:

HEQEP has contributed enormously to the improvement of universities' teaching-learning infrastructure, university-wide facilities and promoted a culture of research through the competitive fund-awarding instrument known as Academic Innovation Fund (AIF) that awarded 439 subprojects to 28 public and 10 private universities in four rounds. AIF provided funds to universities that equipped laboratories with state-of-the-art scientific instruments that generated cutting edge research by the faculties. Using newly established science labs under AIF subprojects 249 students have enrolled in postgraduate research programs of which 98 have completed PhD, 203 Masters and 21 MPhil programs. A total of 115 research articles have also been published in international scientific journals.

Under Window 4 of AIF university researchers have been successful in laying down the foundation of innovation ecosystem. Ten innovation fund subprojects having started in June 2015 demonstrated ground-breaking success in various fields implying that our scientists can make it if provided with world class lab facilities. They came up with innovations that created global impact on production of chemical, pharmaceutical, genetic engineering, bovine vaccine, microchip design products at industrial scale. All these intellectual properties would also be commercially protected through patenting at the international and local level. In the meantime one technology 'Early detection of cancer using Ion-linear optics' invented by the researchers of Shahjalal University of Science & Technology funded by AIF has been submitted for US patenting. More applications for US patents are expected to be submitted by Chattogram and Khulna University researchers soon. Automation of library and digitization of rare manuscripts and PhD theses were also accomplished under HEQEP.

Bangladesh Research and Education Network (BdREN) established under HEQEP strengthened universities' academic and research efficiency through a high speed internet connectivity and campus network in all public universities. Virtual classrooms have also been established in every public university that facilitated the faculties, researchers and students across the county to participate in real time interactive lectures. BdREN has established a dedicated data centre with high performance computing and large volume data storage facilities. Apart from this BdREN has been providing state of the art services to all member universities.

To promote quality education and research UGC Digital Library (UDL) has been established under HEQEP that has been providing access to electronic books and journals to the academia. At present UDL has been



providing access of 34,100 e-resources to 90 universities both public and private through 13 major publishers. The project has also provided RemoteXes and Discovery Tools to subscribing universities to facilitate use of contents.

Under the capacity building component of the project above 5000 faculty including 200+UGC officials have undertaken in-country and overseas training on project management, M&E, proposal evaluation and financial management including procurement.

I am pleased to mention that the project established 'Higher Education Management Information System' (HEMIS) to collect data on academic, finance and institutional management from all universities and administer the sector with an on-line real time data base. This has created a unique facility for the stakeholders, policy makers and peers to get access to the information.

HEQEP introduced for the first time Quality Assurance mechanism in the country that laid the ground for the establishment of Bangladesh Accreditation Council. Institutional Quality Assurance Cells have been established in 69 universities and 800 self-assessment sub-projects of study programs have been undertaken. The project also facilitated establishment of Bangladesh Accreditation Council (BAC) and the National Qualifications Framework (NQF). The BAC shall implement the procedures and practices of accreditation of programs and institutions against the benchmark of NQF. This would take the quality of higher education in the country to the next level and would promote internationalization of higher education.

Further, the Project supported updating of the Strategic Plan for Higher Education 2006-2026. Based on this UGC has produced a new Strategic Plan for Higher Education (SPHE) 2018-2030 in August 2018. This plan provides the road map and an implementation plan for the country's higher education for the next 15 years that would introduce major reforms in planning, governance, quality enhancement, management, financing, research, access and equity and achieving ICT parity.

It appears the ICR captures the whole story of HEQEP with all of its dimensions and I feel delighted to endorse the ICR and its statements.

In conclusion I would like to reiterate that UGC has successfully implemented HEQEP and that the transformation brought about in the higher education sector of Bangladesh must not end. The impetus and the momentum generated by the Project should continue to augment more reforms and changes in this sector in order to attain a respectable position in the world. The UGC and the higher education community strongly feel that a successor project should be on board and that the upcoming HEAT project with higher financial contribution from the World Bank will reflect the aspirations of the higher education community. We desperately look forward to seeing the successful beginning of HEAT and being the implementing agency UGC would inevitably engage itself to make it another success story.

Prof. Dr. Md. Akhtar Hossain,
Member, University Grants Commission



SUMMARY OF BORROWER’S ICR

Government of the People’s Republic of Bangladesh, Ministry of Planning, Implementation Monitoring and Evaluation Division, *Project Completion Report: IMED 04/2003 (Revised)*

Summary

Bangladesh’s Ministry of Planning’s Implementation Monitoring and Evaluation Division commissioned a project completion report (PCR) to summarize HEQEP’s implementation and assess achievement of project objectives and outputs by component. In addition, the PCR analyzed the impact of the project and factors that present risk to sustainability, and those that would arrest those risks and ensure maintenance of project outcomes.

Items of work (as per PP)	Comp.	Target (as per PP)		Actual Progress		Reasons for deviation (±)
		Financial	Physical (Quantity)	Financial	Physical (Quantity)	
1	2	3	4	5	6	7
1.Promoting Academic Innovation:	1	7,762.00	37.78%	7,364.68	95%	
2. Building Institutional Capacity of Tertiary Education Sector.	2	716.93	3.49%			
3. Raising the Connectivity Capacity of the Higher Education Sector	3	7,487.80	36.45%			
4. Establishment of Quality Assurance Mechanism	4	3,166.35	15.41%			
5.Project Management & Communication, and Monitoring and Evaluation	5	1,409.95	6.86%	512.64	36%	
Total		20,543.04	100%			

Achievement of Objectives by Component

Component 1: Promoting Academic Innovation.

The objectives of this component were to establish enabling conditions to improve the quality and relevance of teaching, learning and research and to introduce an efficient instrument for the allocation of public funds with emphasis on innovation and accountability. Its broad objectives are to produce advanced human capital in the form of highly skilled university graduates who would move the country towards higher productivity, economic growth and sustainable development.

Amongst many other achievements during the HEQEP’s tenure, 442 AIF sub-projects were awarded to 38



universities, among which 439 have been completed. Fund utilization rate was very high at 95.71% of the contract value and 98.25% of the disbursed amount. Across eligible universities, thirty-eight (38) out of 41 public universities and 10 private universities have received AIF sub-projects. Much of the projects involved enhancement of infrastructure and the procurement of technology, including 15,229 IT equipment have been procured and installed in 38 universities. In addition, 2,877 office equipment and 13,945 pieces of lab equipment were installed in eligible universities. 1,601 classrooms/laboratories/offices were renovated and furnished with modern teaching and learning IT equipment. In addition to modern technology, classic education materials such as 40,828 books and journals were procured and added to libraries and offices. Training and seminar for capacity building of HEI faculty were a considerable part of AIF funding as 11,476 Faculty members received training on various disciplines and 295 received fellowships from the sub-projects. By project closure, 1,713 Workshop/seminar have organized, where total number of participants were 105,215.

Increased educational achievement and research production exemplify the success of HEQEP as 570 students have completed MS/MPhil degree under the sub-projects. In addition, 84 doctoral students completed their PhD degrees. Further, 158 doctoral students received fellowships under AIF financing. These advanced graduates have demonstrated their productivity and the improved quality of research in Bangladesh's HEI's as 776 papers were published in peer-reviewed journals and 605 books/chapter have published and addition 666 papers were published in conference proceedings as of the last year of implementation. Capacity building beyond workshops is shown in the 501 faculty members who received training from different universities and research institutions of abroad and the 26,689 students and staff who have received training across Bangladesh. Of the total who received training, 76 staff and graduate students attained training abroad.

Component 2: Building Institutional Capacity

The objective of this component was to reinforce the management capacity of the sector, both at the central level and at the level of Higher Education Institutions (HEIs) including sub-components related to strengthening the strategic capacity of UGC; and (ii) Enhancing the institutional capacity of the universities and (iii) Intellectual Property Literacy

Capacity building of UGC and HEIs included laying out a strategy for the higher education sector and laying the foundation for improved management of the university system going forward. A primary output of the component included UGC's publishing the Strategic Plan for Higher Education 2018 – 2030. During HEQEP's implementation, 120 UGC officials received training from different universities and research institutions of abroad. In addition, the UGC developed the web-based HEMIS system, which is hosted and actively operational. Through this and related systems, information related to higher education is available online.

Component 3: Raising the Connectivity Capacity of the Higher Education Sector

The objective of this component was to integrate universities in the world of global knowledge. The primary output of the component was the establishment of the BdREN and the expansion of the digital library.

Under component 3 of HEQEP, the implementation team established the nation-wide BdREN Network with state-of-the-art technology and latest equipment. BdREN was then connected to regional networks



across Asia. To ensure connectivity and optimal user experience, BdREN leased Optical fiber from Power Grid Company of Bangladesh (PGCB) and deployed 405km+ of underground optical fiber access loop by HDD method from PGCB-SS to Universities/institutes. Transmission and backbone networks were established to assure connectivity. Universities received broadband internet, TEIN/global research bandwidth and University-to-University intranet service combinedly from BdREN at a very low cost; this and all ICR services would be maintained by dedicated ICT cells in impacted universities.

Component 4: Establishment of Quality Assurance Mechanism

Component 4 focused on ensuring quality of higher education in Bangladesh through the establishment of QA mechanisms and quality assurance cells at the national and institutional levels respectively and promoting a quality culture within the HEIs in Bangladesh ensuring good practices and governance.

With the establishment of QA mechanisms across participating universities came the QA framework, standards and requirements for the HEIs. To found QA processes and culture, operation manuals and other QA documents and templates were prepared under this component. HEI management was urged to adopt QA mechanism to establish IQAC's in their respective institutions. Overall 69 IQACs were established. Awareness raising of the IQAC's and the wider QA agenda was built around workshops on QA related activities and capacity building workshops and provided technical assistance. Capacity on the new QA cells centered on curriculum workshops and trainings on mentoring, monitoring and evaluating QA practices and processes.

Component-5. Project Management & Communication, and Monitoring and Evaluation

The objective of component was to ensure the proper implementation, management and monitoring & evaluation of the project.

Component 5 was particularly productive over the life of HEQEP, publishing materials that informed projection implementation and served reporting needs. The HEQEPU published the HEQEP Newsletter, "Six years of HEQEP" a video documentary on achievements of HEQEP, published IP policy and the operation manual establishing the TTO and the Strategic Plan for Higher Education 2018 – 2030, and assessed the Achievements of Round -1 AIF Subprojects. The achievements of the sub-projects were published in newspapers and digital media, including on the newly established HEQEP website (<http://www.heqep-ugc.gov.bd/>). A key resource for project implementation progress monitoring was the Project Management Information System (PMIS), established under this component. Publications utilizing PMIS data included the preparation of 18 Semi-annual Monitoring Report, five (5) 20% validation surveys, necessary updates of the Results Framework Matrix of HEQEP, five (5) Environmental Impact Status Reports for AIF sub-projects, the (Governance and Accountability Action Plan) for HEQEP and informed the preparation of Safeguards guidelines and informed reporting on citizen engagement and satisfaction surveys.

To raise awareness of HEQEP and maximize the scope of its achievements, HEQEPU coordinated training and workshops. As an achievement of financed sub-projects, the HEQEPU arranged a Press Conference on Cancer Detection Technology and conducted National Workshop on achievements of HEQEP at Bangabandhu International. To maximize the impact of reformed IP processes the International Workshop on IP Technology in Pune, India was arranged, and experts were brought into assist inventors in patenting



their technology. Lastly, awareness raising through procured materials, advertisements in the traditional media and social media helped spread the word about HEQEP and its successes.

Project Impact

Direct Impact

The overall education and research environment of the sub-project implementing universities/entities have enhanced due to HEQEP. Classrooms and labs have been enriched with the addition of state-of-the-art research and educational equipment/machineries, teaching-learning devices, IT facilities, furniture and relevant renovation. Due to the research environments in impacted HEI's, the number of enrollment and graduation of the MS, MPhil and doctoral students have reached to a significant level.

Due to the quality research outcomes, a good number of papers have published in the reviewed journals. Training and workshops have been arranged for teachers, staff or students to improve human resource skills. The addition of IT equipment and network infrastructure has opened the scope of being connected and updated the university community with the global knowledge domain. The introduction of the integrated educational management software as well as the national e-Government Procurement (e-GP) portal in the universities contributed to a shift toward e-Governance and transparency. The incorporation of specialized software and a library automation system, in some universities, has brought a significant change in the learning and research atmosphere.

A cultural shift in academia has begun as a direct result of HEQEP. Several attempts of patenting research outcomes of the HEQEP sub-projects have brought an improved outlook for researchers in universities throughout the country. Change in mindset about further change. Improved information management has resulted from more organized documentation per the reforms brought about with HEQEP. Ultimately, the success of HEQEP and the sustainability of its impacts result in a positive change of mindset of stakeholders & QA experts as noted in their feedback.

Sustainability

Institutional and financial sustainability were built into the design of the AI through mainstreaming the institutions created to operate the AIF and through incremental budgetary allocations to the MTBF. The MBTF competitive fund was expected to be either pure continuation of the AIF or the merging of the latter with the recently created Academic Research Fund, or a combination of the two. Efforts to ensure the sustainability of BdREN is two-pronged: (i) the creation of an independent Trust is expected to guarantee institutional sustainability; and (ii) a combination of increased budgetary allocations, subscriptions from HEIs, and the introduction of a cost-sharing scheme with end users is expected to promote financial sustainability (mostly associated with maintenance & operational costs, and replacement costs).

The fiscal sustainability of the Project depends on the willingness of GoB to meet recurrent costs associated with the Project. This willingness will be linked to longer term reforms to diversify sources of funds higher education, and in particular with the introduction of some cost-sharing mechanisms between beneficiaries of the AIF and BdREN users. The capacity building activities under Component 2 as relates to strategy and policy development is expected to contribute to the development of options and initiatives to continue beyond project closure.



The PCR recommended ongoing support and capacity building to ensure sustainability of HEQEP activities going forward. For instance, support from the top management of HEIs for closer coordination with UGC and working toward increasing uptake by faculty members, staff and resource persons involved in QA (CETL type institutions) will improve sustainability. In addition, dedicated resources for strengthen existing IQACs and adopting institutional human resource policies related to QA and accreditation may come an endowment fund or other trust organizations to defray fiscal burdens. The PCR also notes that absorbing BdREN project Engineers into the BdREN Trust Organization and the establishment of Campus Network infrastructure for creating the BdREN service demand in full stack to the academicians and researchers would help improve demand reduce service disruption.



ANNEX 6. SUPPORTING DOCUMENTS

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ANNEX 7. Summary of Findings of Beneficiary Workshop

Beneficiary Workshops were held at project closure on December 26, 2018, inviting faculties and students from beneficiary institutions for AIF, QA, and BdREN/UDL components to receive feedback from beneficiaries on benefits and challenges of the project. Outcomes and challenges from the perspective of AIF beneficiaries and IQAC cells were discussed.

AIF-subprojects financed under windows 1 and 2 yielded results in lab development. AIF window 1 established a specialized training center in postgraduate medical research that resulted in the training of 3 groups (2 groups of surgeons and 1 group of students) with a total of 362 people (target of 240). The final year students of Bangabandhu Sheikh Mujib Medical University (BSMMU) are using this center facility, including international students of the institution. In addition, AIF financing led to the development of 8 FabLabs with 6 of them having been registered with the FabLab network. Lab Development under AIF window-2 yielded steel and metal rolling labs which benefited 15 to 20 students and led to the publication of 15 to 20 articles as a result of the work. Roughly 200 people, including faculty and students utilize the labs.

As HEQEP progressed through the different windows of financing, a degree of sophistication improved as well, including the development of genetic diseases diagnostics and intellectual property. Under AIF window 3, the Technology Transfer Office (TTO) established the office, improved the office's IT readiness and developed dedicated skills teams in Intellectual Property (IP) for the benefit of researchers. The office processes IP applications and developed an IP policy for BUET and formed an IP steering committee. The TTO convened workshops that included participants of 400 teachers and students and provided training on IP to faculties in Bangladesh and abroad. The project also demonstrated the potential for collaboration between academic institutions in Bangladesh and institutions abroad as part of improving the relevance of learning and research in the former through training undertaken by students and faculty in Queensland University in Australia. AIF support under window 4 added the development of a diagnostic kit for treatable genetic diseases. Merging the AIF support to the development IP capability, the project expected two (2) patents to come from the Invention Disclosure Form being submitted for one already. The project also has several papers under review. AIF supported three (3) PhD students; the diagnostic lab supports the active work programs of 5-6 people as hundreds of samples are analyzed. However, industry partnership is lacking under this initiative as funding for collaboration has come up short; only one (1) PhD student from the partner organization is involved.

AIF beneficiaries identified challenges with procurement, sustainability, and government processes that hinder the success of AIF-supported projects. Beneficiaries noted that the procurement process is onerous with bottlenecks stemming from centralized procurement processes. Revisions to the budget due to changes in specification require approval and reapproval up and down the business process. Concerns of sustainability of results of AIF stems lacking clarity in resources available for the projects developed under the different windows. Beneficiaries worry that if support is withdrawn then patent efforts will diminish due to financing needs. The awarding of projects going forward need to be centered on sustainability plans. Equipment and software already procured under HEQEP require maintenance and without the AIF may be difficult to sustain. In addition to uncertain resources for facility improvements, onerous procurement processes may lead to an unsustainable backlog. To alleviate these issues, beneficiaries suggested dedicated units for lab maintenance in the UGC. Awareness raising of the benefits of Fablabs



will help in engendering broad support thereby improving their chances for sustained support going forward.

Discussions with faculty of a number of HEI's regarding the IQACs established in their universities confirmed their positive impacts and demonstrated concerns with incentives and sustainability of the quality assurance in HEIs going forward. Representatives noted the improvement of pedagogy in their university after the introduction of the IQAC and commended the campus-wide focus on quality assurance. Student uptake of the assessment is ongoing. Faculty interest in quality assurance is high but that students appear less enthusiastic. Training has been key to improved uptake of IQAC and spreading the word on quality assurance. Workshops and seminars related to quality assurance have been sector-specific in some cases, including a mental health seminar that incorporates quality assurance elements. Curricula have also been updated to reflect an enhanced focus on quality assurance. Course filing and documentation and IQAC administration reflect a growing inclusion of quality assurance in growing areas of participating campuses.

Slow student uptake of quality assurance may be due to a number of factors, including adjustment to a new system. Representatives noted that students have been slow to adopt the QA-infused curricula or other aspects of quality assurance the affected HEI's due to the adjustment involved. Students are moving from traditional makeup of the higher education experience to the new system, and adjustment amongst the other obligations of student life may be contributing to their hesitation. This has led to slow uptake of quality assurance relative faculty in the same institutions. Students exhibited confusion over what the IQACs did and how its work was to be incorporated into their coursework and campus life. Representatives also believed that lack quality in teaching and research environments in universities, particularly public universities, may have contributed to difficulty in attaining student buy-in to the QA systems newly in place with HEQEP.

In addition to the challenges with student support for IQACs and QA in general, representatives of the universities in the workshop expressed concern over sustainability and bureaucratic process, among others, presenting challenges to the spread of IQACs across the higher education sector. Representatives at the workshop widely viewed bureaucratic processes in UGC as a prime contributor to delays in the work of IQACs. In addition to this, resource constraints and unknown sources of funding for IQACs going forward contribute to concerns of sustainability of the IQACs as universities work through the process of internalizing QA broadly. Participants expressed the need to address limitations in the implementation improvement and fiduciary plans as guidelines were not clear. Though faculty support for QA is high the incentive structure and remuneration for facilitators are lacking, sophisticated KPIs and other incentives may improve faculty motivation for QA where needed. As a related point, faculty working on QA could be involved in an accreditation process and training per international standards would improve the reputation of IQACs within and across universities.



ANNEX 8. Summary of Key Findings: (1) Final Round Satisfaction Survey [incl. methodology]; (2) Graduate Tracking Survey; (3) Final Impact Assessment

The following are summaries of the Borrower's "Final Round Satisfaction Survey of Higher Education Quality Enhancement Project (HEQEP)"; "Tracer Study of Graduates of Universities in Bangladesh"; "and "Final Impact Assessment of HEQEP 2018."

Final Round Satisfaction Survey of Higher Education Quality Enhancement Project (HEQEP)

The Government of Bangladesh commissioned a Final Round Satisfaction Survey (FRSS) among students, faculties and employers of the AIF institutes/departments to assess the satisfaction level of the stakeholders at project closure. The study assessed the direct beneficiaries' perception of the value of the interventions under HEQEP, with specific focus on the AIF sub-projections. The FRSS found that incorporating technologies under the AIF sub-projects improved the learning environment, enhanced faculty's abilities to teach more advanced concepts to students, and improved interactions between students and teachers. In addition, sustained support to ensure the availability of funding is key to maintaining the positive benefits of HEQEP.

The teaching and learning environment have improved significantly under HEQEP. With the financial support of HEQEP, researchers have greater freedom to conduct research and have the resources to disseminate their findings, and defend their work, among wider audiences – nationally and globally. The surveyed largely found that AIF-sponsored studies were the impetus behind capacity building in the impacted institutions with HEQEP playing a crucial role in rejuvenating the research environment. The projects under the AIF invigorated the atmosphere for research in public universities. Technologies developed and introduced under the AIF was perceived as enhancing the teaching and research environment.

Faculty members in AIF departments were found to have higher satisfaction levels overall, especially when compared with peers in the control group. Faculty members showed greater satisfaction with AIF-financed departments and noted that the AIF support improved the quality of infrastructure in their departments. The AIF support for infrastructure and materials was deemed as having improved the overall quality and availability of teaching equipment and facilities and contributed to improved satisfaction in these areas compared to the control group. Faculty were particularly impressed with the availability of online teaching and learning materials, and books and journal, specifically as they related to HEQEP components like the BdREN. Overall, the teaching and learning environment from the perspective of AIF faculty was positive and much appreciated.

Students in AIF -financed institutions were surveyed as being more satisfied than peers who did not receive AIF funding. Their assessment of the impact of AIF was weighted more heavily than the others, since the key determinant of education quality is student achievement. Students in AIF departments did not survey higher survey satisfaction across a number of common indicators of pedagogy (such as quality of instruction), but AIF departments were found to more effectively use technology in instruction. AIF student spent more time in average in laboratory or advances research settings and reported more access to digital library resources than non-AIF students, both directly attributable to HEQEP. AIF support was used towards the improvement of facilities in the financed departments, so this is a welcome, if not



surprising development. And the AIF financing also proved widely known by project closure as nearly 3/4 of all surveyed non-AIF students were aware of AIF financing; up to 85% of students in AIF departments were aware their units were receiving AIF support.

Employers were surveyed and were found satisfied with key skills of the AIF graduates. Graduate employment is one of the main objectives of completing higher education, and 75 employers of the graduates of AIF departments were surveyed. These employers were spread across different sectors of the economy. In particular, customer service skills, critical thinking and analytical skills, communication in English, advanced computer skill and willingness to learn were rated highly. Overall, employers were satisfied with the quality of the graduates of AIF subproject institutions.

Though the surveyed viewed the AIF sub-projects as having near universal positive impact on the teaching and research environments, sustainability was an ever-present concern. Improving the teaching and research environment requires making the qualitative changes that require sustained resources and dedication. Faculty members nevertheless sought to underscore the value of infrastructural and technological changes under the AIF have moved the needle in the right direction.

Final Satisfaction Survey Methodology

The final satisfaction survey employed both quantitative and qualitative research in surveying students, faculty, and employers. The approach included a (1) questionnaire, (2) focus group discussions (FGDs) as well as (3) key informant interviews (KIIs) and (4) detailed interviews to assess the satisfaction of the key demographics with the HEQEP.

During HEQEP, 37 universities received AIF grants. Analysts chose to keep one-third of the 100 department-sample as control, randomly choosing 67 AIF departments and 33 non-AIF receiving departments. The universities were chosen to be representative across 8 administrative divisions of the country. Of the total departments sampled, 17 were in private universities that received AIF in the first 3 rounds; all 9 private universities were sampled given the feasible possible. In total, the study team surveyed 2,116 students from AIF departments and 987 students from non-AIF departments.

For the qualitative survey, students, employers and faculty were assessed for satisfaction using focus group discussion (FGD), key informant interview (KII) and/or in-depth interviews. A part of the survey, 3 focus group discussion and 4 in-depth interviews of students and faculty from public universities were conducted, and 2 FGDs and 4 in-depth interviews of students and faculty from private universities, and 1 FGD and 2 in-depth interviews of students from agricultural or technical universities. These FGDs and interviews were supplemented by 4 in-depth interviews of staff members from public and private universities, and 2 interviews of faculty of agricultural / technical universities. Interviews were conducted by trained enumerators utilizing a structured questionnaire, overseen by supervisors who reported to the survey team. The survey team made random site visits to assure quality in application of the survey. Follow-up visits were conducted as needed following the selection, interview, data collection and analysis, to gather data on areas lacking a fuller picture.

In enumerating the responses of the survey, a 5-point Likert scale was employed for data collection and analysis. This method allowed for relative ease of assessment and interpretation, especially for



respondents and enumerators. It also allowed for the use of parametric and econometric analysis, including the least square method. Analysts employed the simple t distribution to compare mean responses between sampled groups and disaggregated data as needed. By contrast, parametric analysis was used to compare mean of outcome responses between the AIF and non-AIF groups sampled, but parametric tests were limited primary to assessing differences for easy interpretation.

Tracer Study of Graduates of Universities in Bangladesh

The students in the institutes that received direct support under HEQEP were the ultimate focus of the development objective of HEQEP and their employability was the primary measure of the success of the project. To assess the employability of students impacted by HEQEP, two rounds of quantitative tracer studies of university students and graduates were undertaken with a special focus on the impact of AIF support. The use of the tracer studies informed stakeholders of the current status of the graduates and institutional performance, allowing for assessment of HEQEP's impact. The results of the tracer study offer stakeholders assessment of the possible scope of improvement of the project and underscore next steps for AIF.

The analysis of the tracer studies found that that AIF projects were effective in improving skills, job search prospects, and employability, per the responses of current students and graduates. The top two effective facilities were establishment/renovation of a lab and establishment of multimedia facilities, as reported by students. The top three AIF supported facilities as per all employed graduates were the establishment of multimedia, facilities for effective teaching, and classroom renovation. The AIF supported facilities also keep a role in institutional quality as responded by institute heads. The top elements of AIF supported investment are updated curriculum, laboratory establishment/ renovation, and internet facilities.

The study assessed the effectiveness of AIF in improving the quality of education and the attainment of skills and employability. The majority of students found the AIF facilities to be effective. Of the employed graduates who were surveyed, the vast major found the AIF facilities to be effective in improving skills and job search. Respondents noted that the facilities they found most effective were related to multimedia, pedagogy support, and classroom renovation.

Heads of department and institutions and program managers found he AIF to be effective in improving institutional quality and student employability. A majority of respondents reported that AIF-supported facilities effective in improving institutional quality in their departments or institutions more widely. Most department heads said that the AIF -financed facilities were considered effective in improving skill and employability of students. Surveyed heads of departments and institutions found that AIF-improved facilities were mostly effective in improving skills and employability of students. These respondents considered the establishment of new labs and the renovation of research labs, updated curricula and classroom renovation were the most welcome and effective AIF-supported inputs.

Students from AIF-supported institutions reported a high rate of unemployment (38 percent) among all university graduates in Bangladesh. The average duration of unemployment is less than a year (around 10 months). The study also showed that private university graduates have a higher chance of getting a job than public university graduates. Private university graduates' family income is higher than public university graduates' family income. Parents of private university graduates have higher educational



qualification than parents of public university graduates so future efforts will likely need to focus on public universities or support for admitting students from lower socio-economic backgrounds into private universities.

The tracer study found that there is a considerable lack of academia-private industry collaboration. Less than half of surveyed employers maintain collaboration with universities and even less in any sort of sustained way. However, from the academic institution side, most mentioned maintaining some kind of relationship with industries. The private universities were found more active in maintaining industry linkage compared to public universities and variation in industry linkage depends on the departments to which respondents belonged. From the university perspective, respondents noted that the channels with most collaboration included reviewing and updating curriculum, student internship coordination, and workplace visits. Employers responded that professional networking with faculty and student recruitment were the avenues with the greatest amount of collaboration.

Final Impact Assessment of HEQEP 2018

The Final Impact Assessment of HEQEP was commissioned by the Borrower to assess the impact of HEQEP on enhancing the quality and relevance of higher education in Bangladesh and whether the project achieved its objectives. The assessment reviewed the implementation progress toward achieving the HEQEP's PDO and outlined achievements by component. In addition, the impacts of each component were measured by project design, relevance, effectiveness, implementation efficiency, impact, learning and sustainability. The assessment found that HEQEP accomplished varying innovative activities under its components over its life, providing inventors with foundational support and strengthening university-industry partnerships. The assessment provided recommendations for HEQEP's key stakeholders, including the UGC, university authorities and sub-project managers and suggested a way forward that promotes closer partnership between universities, GoB, and the private sector.

By component, HEQEP proved innovative and successful in improving the relevance of research and education in Bangladesh. In component 1, design was considered appropriate and relevant improve quality teaching and learning, though the assessment concluded that time constraints limit review of both design and effectiveness. Nevertheless, impacts were clear as modernized facilities and curricula amongst other inputs in HEQEP were key to the project's success were the numerous opportunities of knowledge management that assured a circle of learning throughout implementation. Component 3 on BdREN, Campus Network, Campus E-Presence, and Digital library, was found to be well-designed and effective, but the extension of these developments is needed to ensure sustainable results. The Digital Libraries in particular are as yet less familiar to students and faculty, suggesting additional training and communications needed to spread the word. The QA entities implemented under the component were found to be useful in building capacity for quality assurance and peer assessment in academia in Bangladesh.

Each component was assessed through end-line evaluations which allowed the assessment to explore the effectiveness of HEQEP. Inputs from sub-project managers, faculty and department chairs were used to assess the effectiveness from the perspective of key stakeholders. Under component 1, respondents promoted their projects as innovative and remarked on how new the projects were in Bangladesh, if not in other development contexts elsewhere. Projects were considered well-designed overall, but there in



some cases there was confusion on the achievement of project objectives. Ample funding for AIF sub-projects was considered a strength of beneficiaries but following the project schedule and time constraint for procurement place undesired pressure on the team was considered by respondents to be a weakness of the AIF component. Awardees reported that their subprojects contributed to teaching and learning as teachers and students have become more interactive in classrooms, teachers use technology in the classrooms (e.g. multimedia), students take help of technology or software (e.g. FabLab, software in lab) in learning or doing assignments or projects, get easy and quick access to information, books, and journals in digital library, and also get new and in-depth knowledge through research, evidence and practical learning. Reflections on the effectiveness from awardees was positive and though the value for money was difficult to measure, the structure of the AIF did enforce transparent procurement practices which was appreciated by participants.

HEQEP was an innovative program developing quality in teaching-learning and engaging a significant number of students and teachers in conducting research and enhancing the quality of higher education sector in Bangladesh. The surveys showed that those projects that got the most support and cooperation of their highest authority fared the best, presenting a lesson to UGC and the Universities to ally more closely to achieve sustainable and quality higher education at the higher education sector.



ANNEX 9. Summary of AIF sub-projects

Success stories of AIF subprojects (adapted from Final Impact Assessment of HEQEP 2018, Annex IV)

As mentioned earlier, a total 442 (3 subprojects abandoned in the stage of commencement) have been implemented in total 38 universities (public 28, and private 10) for enhancing teaching-learning and research in higher education. These projects had wide ranges of focus. A few, among those sub-projects, are widely considered as success stories under HEQEP project.

However, the following were a few success stories with numerous publications which signify more academic and monetary prospects of the subprojects considering the investment:

- Five Livestock and Poultry vaccines developed by BAU and ready for commercialization.
(Professor M. Bahanur Rahman, Department of Microbiology and Hygiene, BAU)
- Research beats the environmental effects on coastal agriculture
(Crop cultivation technique avert ill effects on environment on coastal agriculture)
(Professor Dr. M. A. Halim and Professor Dr. Habibur Rahman Pramanik, Department of Crop Botany, BAU).
- Genetic Research facilities and Patent Care services in the BSMMU.
(Professor Laila ArjuanBanu, Department of Genetic Research and Molecular Biology, BBSMMU)
- Discovery of Novel plant growth promoting bacterial strains from the native environment
(Professor Dr. Md. Tofazzal Islam, Department of Biotechnology, BSMMU)
- A new Mechanical Characterization Laboratory for earthquake resistance measurement for building materials
(Dr. Md. Aminul Islam, Department of Materials and Matallurgical Engineering, BUET)
- Mechanical Engineers of human heart: BUET embarks upon Biomedical Engineering
(Professor A. B. M. Taufique Hasan, Department of Mechanical Engineering< BUET)
- Modernizing BUET central library: to shape the way students learn and enjoy reading in the 21st century
(DR. S. M. Mahbubur Rahman, Professor, Department of Electrical and Electronic Engineering, BUET)
- Air quality monitoring center in the University of Dhaka
(Professor Dr. Shahid Akhtar Hossain, Department of Soil, Water and Environment, DU)
- Combating foot and mouth disease in Bangladesh
(Professor Dr. Md. Anwar Hossain, Department of Microbiology, DU)
- Novel functional materials developed for technological application
(Professor M. Y. A. Mollah, Department of Chemistry, DU)



- Modern laboratory for teaching and research in Microwave Engineering and Optical Fiber communication
(Professor Anis Ahmed, Department of Applied Physics, Electronics and Communication Engineering, DU)
- 400 MHz FT-NMR for researchers in physical and Biological Sciences in Jahangirnagar University
(Professor Kazi Ali Azam, Director, Wazed Miah Science Research Centre, JU)
- Modern Plant Biotech Laboratory and Germplasm Centre/Gene Bank at PSTU
- (Professor Dr. MahbubRobbani, Department of Horticulture, PSTU)
- ICT based teaching-learning environment in the department of Botany, RU
(Professor Dr. M. Monzur Hossain, Department of Botany, RU)
- A modern laboratory for research on optical behavior and structure analysis of nonlinear materials
(Professor Yasmeen Haque, Department of Physics, SUST)
- Materials with Linear and Nonlinear optics and liquid crystallinity

Selected AIF Success Stories

Success story-1: Technology of Detecting Cancer: An Innovation of SUST Researchers

Title of the subproject: A modern laboratory for research on optical behavior and structure analysis of nonlinear materials

Subproject Manager: Professor Dr. Yasmeen Haque, Department of Physics, Shahjalal University of Science and Technology (SUST)

Project Description: The project invented a cost-effective, world class technology to detect cancer in human body through Non-linear Optics. It is to be noted that the team received financial support from the university-industry collaborative research subproject of Higher Education Quality Enhancement Project (HEQEP) being implemented by the University Grants Commission of Bangladesh with joint funding of the Government of Bangladesh and the World Bank. Provisional patent applications have been filed both in USA and Bangladesh with the title “Method and System Based on Non-linear Optical Characteristics of Body Fluids for Diagnosis of Neoplasia (Cancer)” on 09 July 2018 to protect the IP rights of the invention.

This breakthrough discovery of optical biomarkers to detect cancer has opened up a new field of research and work must continue to get greater benefits from it, said Yasmeen Haque, who led the team behind the discovery. Explaining the technology, she said that nonlinear optics was the study of how intense light interacted with matter. “We witnessed a significant difference between nonlinear parameters of blood

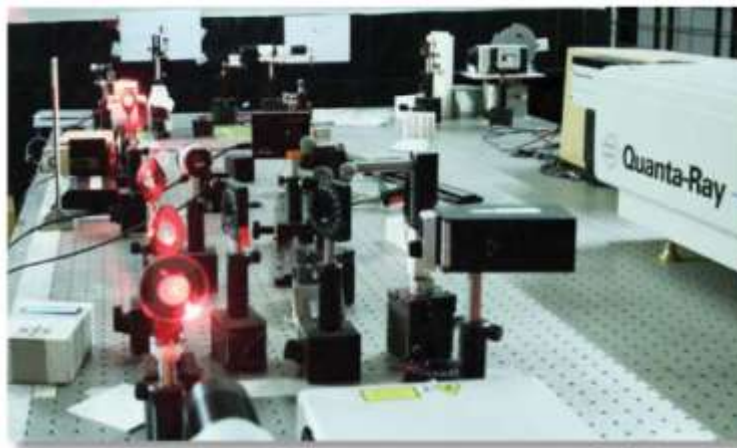


samples from cancer patients and healthy people,” she said. A team of 25 physicists, led by professor Yasmeen, came up with the findings recently. It revealed that the method could detect even minor changes and could theoretically open up new possibilities in cancer detection at early stages.

In 2011, The Higher Education Quality Enhancement Project (HEQEP) awarded a subproject linear Optics (NLO) group at SUST in the Department of Physics. This helped in Nonlinear Optics Research Laboratory. MS and PhD students started conducting experiments on fundamental properties of various organic, inorganic and bio samples. The path to discovery began when the team started studying fundamental properties of light matter interaction back in 2013.

During that time, RA Mashelkar, president of Global Research Alliance, paid a visit to the he was very happy to see our lab and the experiments the team was doing. He then said, 'why don't you see if there are applications of this?' That prompted Dr. Yasmeen’s students to see if there were nonlinear changes that could lead to cancer detection. Back then, glucose and being measured by nonlinear optical method but no one had yet used it for cancer diagnosis.

In 2015, the NLO research team started looking at practical applications of these studies. In a proposal submitted under Window 4, the researchers suggested an innovative idea; using these experimental biomarkers in cancerous samples. The HEQEP project CP-4044 was awarded to the NLO construction of a new “Nonlinear Bio Optics Laboratory” where studies have started on experiments with blood samples obtained from cancer patients. Around BDT 9 crore was provided in two phases to the research group for developing laboratory and conducting research.



Professor Yasmeen fondly recalled how proud she was of her students who put in a lot of hard setting up the lab to conducting the research. The experiments were very arduous. “Our lab is the most sophisticated lab in the country. The whole experimental procedure is automated, and they did it all by themselves.” Referring to innovative ideas that the team had come up with in different steps of the research, Professor Yasmeen said they even developed quartz sample holders for TK 500 each and normal glass holders for Tk 20 each. Such a holder used to be imported spending Tk 27,000 and once it was stained with blood and subjected to laser beams, it became useless and had to be discarded. In this sub-project, the industry partner is Invent Technologies. LTD which helped process blood samples and provided the team with the



serum to conduct the test.

The team is now working to make a prototype device of the lab experiments and hopes to get reliable results. It is expected to be ready in a year and will help conduct the tests within a very short time for less than Tk 500. Then industries may come in if they want market the product. that Yasmeen's students to see if there were nonlinear cholesterol concentrations were used it for cancer diagnosis. Two companies: one local and another foreign have already shown interest in investing in the upcoming phases of the research.

Asked if this method would diagnose cancer with more accuracy than other existing ones, Yasmeen said it was too early to say but "the method we are using is very sensitive". "At this moment all we are trying to say is that we are going to try to identify optical biomarkers. Some markers saying this blood is different from normal, healthy blood. "Since we have seen some signs that we didn't expect to see so early, maybe we can see some signature that will tell us whether this [a sample] is cancerous ... at an earlier stage." In Bangladesh, a patient is diagnosed with cancer usually when it reaches the third or fourth stage. The team is yet to determine the accuracy and experimental measurement error that may occur during the test. It conducted the optical experiments on blood samples from 10 healthy people and 40 cancer patients.

Experiments on a larger scale would help find the accuracy rate, Professor Yasmeen said. However, the test does not require any reagent which means there are no external parameters to look into, said the lead researcher. Regarding the financial aspect, the SUST professor said it was the lack of funds for research that drove talented Bangladeshi students to countries like the USA. If the government or industries come forward fund to scientific research, the country will be able to keep its talents, gain new knowledge and turn it into wealth, Yasmeen said. "The best outcome of our research is a strong nonlinear optical research team with exciting work ahead. This is just the tip of the iceberg. The research has to continue for years and years to come".

Success story-2: Innovation in food varieties

Title of the subproject: Enrichment of Facilities for Effective Access to Higher Studies and Advanced Researchers in Horticulture (CPSF-466)

Subproject Manager: Dr. MahbubRobbani, Innovation: 8 new fruits variety

Name of the varieties: PSTU Bilati Gab (Velvet apple)
Kamranga (Carambola) -1; PSTU BatabiLebu (Pomelo)
(Monkey Jack)-2; PSTU Kamranga (Carambola)

Specialty of innovation: All these varieties are sweeter than apple varieties are by nature seedless type. Asexual propagation by cleft grafting of these varieties induced a dwarf canopy structure which is a favorable trait for cyclone prone plantation and roof gardening too.

Project Description:

Being located at the southern area, the D horticultural research approaches suitable for the coastal edaphic and climatic conditions. The advanced research capacity of this department was emerged and



enhanced during January 2011 when Plant Biotech Lab and Germplasm Center support of the HEQEP sub-project CP466 been possible due to its sale proceeds from Germplasm Center and a lump sum grant received from UGC. In 2017, a supplementary fund was also awarded for sustainable continuation of the previous sub activities. As a consequence of this sub through screening of the indigenous fruit genetic resources available in the coastal area. The National Seed Board (NSB), Ministry of Agriculture has recognized the varieties.



In Bangladesh, fruit consumption per head per day is about 77g against the minimum requirement of 115g per head per day which indicated that their production could meet only 67% of her requirements. Coastal region is a seat of species diversity for several native fruits, such as tamarind, aonla, velvet apple, golden apple, date palm, palmyra palm, river ebony, carambola, cowa, monkey jack, sapota, wood apple etc. Most of these fruits have high medicinal value and are rich source of vitamins, minerals, dietary fiber, and antioxidants. Apart from the nutritional and food security value, the income generation and poverty alleviation potential from these fruit species is enormous especially in the impoverished economy of disadvantaged coastal community.

About 50 local farmers are directly linked with the up-scaling activities of Germplasm Center and the community people have shown their interest to buy the Quality Planting Materials (QPM) from this Center. Sale proceeds from QPM have made the Germplasm Center as a self-reliant one. A series of research steps are yet to be done to promote commercialization of the new varieties. Till today, there are 58 types of native fruits belonging to 29 families, 60 species and 646 accessions have been conserved in the Germplasm Center. Morpho-physico-chemical characterizations have been done for about 15 accessions.

Prof. Dr. Robbani said “We strongly believe that our facilities could be utilized for commercial and around production of quality plantlets. Analytical facilities have potential for seed industry to test germination, purity, vigor, variability and hybridity of seeds. Our Germplasm Center has enough opportunity for



contractual production of QPM for nursery and fruit industries to support the emerging needs of coastal agriculture towards nutritional and food security.”

He added that a comprehensive characterization leading to DNA profiling of these native fruit genetic materials would pave the way for establishing IPR protection and patenting in some cases. So far, research works in the laboratories yielded four articles in the reputed journals. “We believe that this research effort will be a reflection to popularize and commercialize the galaxy of underutilized fruits available in Bangladesh”, he further added. Under the subproject an idealized plant biotech laboratory has been established (first one at PSTU). Since establishment, about 700 UG students of biological science related departments have got access for conducting hands on practical classes, and about 20 MS and PhD students performed researches related to plant TC and DNA analysis. This lab has become a model learning place for the neighboring college students of the Department of Botany.

Moreover, genetic diversity analysis of drumstick was performed using RAPID marker. In vitro regeneration protocols established for lettuce, potato, strawberry and chrysanthemum for Quality Plant Material (QPM). Rapid multiplication and in vitro salt tolerance screening of potato is being carried out. Two classrooms have been refurbished, upgraded and modernized. The entity is equipped with teaching –learning equipment. A seminar room cum library has been established with a collection of about 600 latest books, journals, theses etc. Syllabi have been updated with new and need-based study topics. A substantial increase in PG enrollment has been observed, such as MS and PhD students in 2010 were 4 and 1 respectively, but in 2018 the numbers are 32 and 5.

Six academic collaboration meetings with resource persons from teaching, research and extension organizations were held. MoU signed with three agro-based organizations (ACI, Supreme Seeds, and ACF). Three training programs were arranged for capacity buildup of the faculties, PG students and staffs.

Success story-3: Country’s first anatomy museum established

Title of the subproject: Enrichment of Anatomy Museum for Enhancing Quality Education and Research at the Department of Anatomy and Histology (CP2179)

Subproject Manager: Professor Dr. M. Lutfur Rahman

Innovation: Establishment of Anatomy Museum

Project description: The Department of Anatomy and Histology of Chittagong Veterinary and Animal Science University has developed the country’s first anatomy museum under the subproject. By definition, anatomy is the branch of science which deals with the bodily structure of humans, animals and other living organisms, especially as revealed by dissection and the separation of parts. The museum, housed in a spacious well decorated room in the Department of displays skeletons of different animals and birds like crocodile, snake, lizard, pig, ostrich and monkey.

The museum, housed in a spacious well decorated room in the Department of displays skeletons of different animals and birds like crocodile, snake, lizard, pig, ostrich and monkey. Besides, the museum displays 30 stuffed animals, 20 animal models, 500 sp formaldehyde, 2,000 different types of bones, 75 models of different animals, 3,000 different slides and 30 portraits of scientists. Dried soft organs of some



animals are also preserved in the museum. The university authorities have not fixed any entrance fee yet. Therefore, anyone can visit the museum free of cost on weekdays.



“CVASU is a specialized university cherishes to become center of excellence in biological arena. The Anatomy museum would be very helpful to provide our thankful to HEQEP for awarding as many as 11 subprojects in CVSAU which helped us enormously to develop our research laboratories, establish anatomy museum, fisheries museum and purchase of teaching-learning equipment”, Professor Goutam Buddha Das, Vice statement while talking about his vision and contribution of HEQEP in CVASU. “We have a very rich collection of anatomical specimens in the museum. The museum houses skeletons of different types of mammals, birds, reptiles, primates and ruminants,” said Prof Dr Mohammad Lutfur Rahman, chairperson of department of Anatomy and Histology and also the subproject manager. “The students will be able gain hands anthropologists, ornithologists, zoologists, wildlife conservationists, embryologists and paleontologists will be greatly benefited from the museum,” Prof Dr. Lutfur added. Drawing a line between an anatomical laboratory and a said: “The educational institutes of our country have some anatomical laboratories.