ADB

Board of Directors

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R78-18
9 August 2018

Proposed Loans
Science and Technology Human Resource Development Project
(Sri Lanka)

1. The Report and Recommendation of the President (RRP: SRI 50275-002) on the proposed loans to Sri Lanka for the Science and Technology Human Resource Development Project is circulated herewith.

2. This Report and Recommendation should be read with *Country Operations Business Plan: Sri Lanka, 2018–2020*, which was circulated to the Board on 1 September 2017 (DOC.IN.298-17).

3. In the absence of any request for discussion and in the absence of a sufficient number of abstentions or oppositions (which should be communicated to The Secretary by the close of business on 30 August 2018), the recommendation in paragraph 37 of the paper will be deemed to have been approved, to be so recorded in the minutes of a subsequent Board meeting. Any notified abstentions or oppositions will also be recorded in the minutes.

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Report and Recommendation of the President to the Board of Directors

Project Number: 50275-002
August 2018

Proposed Loans
Democratic Socialist Republic of Sri Lanka: Science and Technology Human Resource Development Project

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 1 August 2018)

Currency unit	–	Sri Lanka rupee/s (SLRe/SLRs)
SLRe1.00	=	$0.0062637
$1.00	=	SLRs159.65

ABBREVIATIONS

ADB	–	Asian Development Bank
IT	–	information technology
MHECA	–	Ministry of Higher Education and Cultural Affairs
PIU	–	project implementation unit
PMU	–	project management unit

NOTE

In this report, "$" refers to United States dollars.

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PROJECT AT A GLANCE

1. Basic Data — **Project Number:** 50275-002

Project Name	Science and Technology Human Resource Development Project	**Department /Division**	SARD/SAHS
Country	Sri Lanka	**Executing Agency**	Ministry of Higher Education and Cultural Affairs
Borrower	Democratic Socialist Republic of Sri Lanka		

2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓ **Education**	Tertiary	145.00
	Total	**145.00**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	CO_2 reduction (tons per annum)	2,686
		Climate Change impact on the Project	Medium
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	**ADB Financing**	
		Adaptation ($ million)	0.26
		Mitigation ($ million)	4.35

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Client relations, network, and partnership development to partnership driver of change	Gender equity (GEN)	✓
	Organizational development		
Partnerships (PAR)	Implementation		
	Private Sector		
Private sector development (PSD)	Public sector goods and services essential for private sector development		

5. Poverty and SDG Targeting		**Location Impact**	
Geographic Targeting	No	Rural	Medium
Household Targeting	No	Urban	Medium
SDG Targeting	Yes		
SDG Goals	SDG4, SDG5, SDG8, SDG13		

6. Risk Categorization: Low

7. Safeguard Categorization **Environment:** B **Involuntary Resettlement:** C **Indigenous Peoples:** C

8. Financing

Modality and Sources	**Amount ($ million)**
ADB	**145.00**
Sovereign Project (Concessional Loan): Ordinary capital resources	61.98
Sovereign Project (Regular Loan): Ordinary capital resources	83.02
Cofinancing	**0.00**
None	0.00
Counterpart	**20.00**
Government	20.00
Total	**165.00**

Source: Asian Development Bank

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on proposed loans to the Democratic Socialist Republic of Sri Lanka for the Science and Technology Human Resource Development Project.

2. The project will support the government in developing the applied science and technology faculties in four universities to nurture a new breed of technology-oriented graduates equipped with market relevant skills and entrepreneurial spirit.[1] It will address lack of financing for priority degree programs, which are in high demand from students and industry. The project will provide innovative and industry-relevant technology education and research facilities, help quality curriculum design and academic staffing aligned with international standards, and provide competitive grant scheme and capacity development opportunities.

II. THE PROJECT

A. Rationale

3. Sri Lanka has recorded steady economic growth of 5.2% per annum for the last decade.[2] Per capita gross national income was $3,840 in 2017, well on track to become an upper middle-income country.[3] To achieve higher incomes and better standards of living, the government envisions transforming to a knowledge-based economy by 2025.[4] Investment in human capital is prioritized for economic diversification and enhanced productivity.[5] Sri Lanka ranked 73rd in the Human Development Index, outperforming other lower middle-income countries, and this is attributed to good access to education.[6] Challenges remain in quality of learning, particularly in science, technology, and engineering subjects, as well as relevance to the labor market, especially in the face of rapid technological changes. Higher education plays an instrumental role in producing a future-ready labor force, but Sri Lanka's higher education system is facing several challenges.

4. **Limited access**. Higher education opportunities are limited. The gross enrollment rate is 18.9%, which is far lower than that of the upper middle-income country average of 50.7%.[7] Increasing demand for higher education is evident from steep competition for public university admission, the large number of external degree program students, and increasing numbers of students seeking private higher education. Disciplines offered are largely skewed toward liberal arts, social studies, and management, and less than 20% of graduates are from science and engineering subjects. As a result, less than four science, technology, and engineering graduates are available for every 100 age cohort in Sri Lanka, compared with over 15 in Malaysia and 30 in

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[1] The proposed project will support new degree programs in engineering technology, biosystems technology, and information and communication technology under the newly introduced technology faculties, as well as degree programs in engineering faculty at Sri Jayewardenepura University. The Asian Development Bank (ADB) provided project preparatory support through ADB. 2012. *Technical Assistance to Sri Lanka for Human Capital Development Capacity and Implementation Support*. Manila (TA 8235-SRI, $3,350,000, approved on 3 December 2012).

[2] ADB. 2018. *Asian Development Outlook 2018.* Manila.

[3] The World Bank's upper-middle income country threshold is $3,896 in 2017. The World Bank Open Data https://data.worldbank.org/country/sri-lanka (accessed on 1 August 2018).

[4] Government of Sri Lanka. 2017. *Vision 2025: A Country Enriched*. Colombo.

[5] Government of Sri Lanka, Ministry of National Policies and Economic Affairs, Department of National Planning. 2016. *Public Investment Programme, 2017–2020*. Colombo.

[6] United Nations Development Programme. 2017. *Human Development Report 2016*. New York.

[7] United Nations Educational, Scientific and Cultural Organization Institute for Statistics http://uis.unesco.org/ (accessed on 20 February 2018).

the Republic of Korea. Private higher education is focusing on management and information technology (IT), where capital investment is moderate. The main constraint is high upfront capital investment requirements for higher education in science, technology, and engineering disciplines.

5. **Quality concerns**. Research and practical learning in science, technology, and engineering are limited because of lack of laboratory facilities, researchers, and capital investment. Lack of qualified academic staff constrains quality of teaching, learning, and research. There were 5,440 academic staff in 2016, but less than 50% have a doctor of philosophy degree. Recruiting and retaining qualified academic staff is difficult because better working conditions (e.g., salary and organizational culture) offered in the private sector and overseas. The vacancy rate at universities was estimated to be 28% in 2014. The pedagogy should transform from an input-based approach to outcome-based education and student-centered learning to foster critical thinking and problem-solving competencies as well as other modern job market requirements such as entrepreneurship and leadership, teamwork and collaboration, and communication.

6. **Areas of improvement for job market relevance**. Job placement rates are high for graduates in IT (92%), engineering (92%), and science (83%) compared with overall average (66%). However, even among science, technology, and engineering graduates, cognitive and noncognitive skills, such as analytical thinking, problem solving, communications, and teamwork, need further improvement. Degree programs are more theory-oriented and lack application or practical use of knowledge and skills. Such deficiency becomes evident in the skills gaps among current industry managers from those disciplines. Flexibility and ability to continuously learn and upgrade skills are the competencies most needed for science, technology and engineering graduates to survive and lead the rapid technological changes.

7. **Gender dimension**. Over 60% of undergraduates are female students in Sri Lanka. However, female enrollment is more concentrated in liberal arts and social studies (82.4%) where unemployment is the highest. Gender parity in computer science or IT and technology faculties (50.4% and 45.6% female) is nearly achieved, and around 22.0% of engineering students are female. This is higher than the developed-country average. Encouraging more women to take technology disciplines will increase women's career opportunities in technical areas where wages are high. This would also help challenge stereotypical gender roles in the economy, and increase women's labor market participation in nontraditional areas.

8. **Opportunities in science, technology, and engineering education**. Despite impressive employment outcomes, there were only 5,012 admissions for science, technology, and engineering in 2016, which is only 17.2% of total admissions. The main constraint is financing. The government expects that priority economic development initiatives, like the Colombo–Trincomalee Economic Corridor, would generate 580,000 incremental jobs in manufacturing between 2020 and 2032, and around 10%–15% of such job opportunities would require advanced skills in technology. One of the constraints to such development initiative would be the lack of a skilled workforce.

9. **Government initiatives**. In response to the high demand for a technically-oriented workforce and the need for diversifying pathways for youth, the government introduced the technology stream to secondary education (grades 12 and 13) in 2013. The Asian Development Bank (ADB) supported this initiative through its Education Sector Development Program.[8] Since

[8] ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Results-Based Loans to the Democratic Socialist Republic of Sri Lanka for the Education Sector Development Program.* Manila.

2015, around 7,000 technology stream students have become qualified for higher education annually. The government selected 11 public universities to open new technology faculties to offer higher education for technology stream students.[9] In 2016, 2,016 students were enrolled in technology faculties. With the support from the World Bank, the government has already provided financing to get the technology faculties started for 8 public universities.[10] The government requested ADB support for the remaining 3 universities—Kelaniya, Rajarata, and Sabaragamuwa to develop their technology faculties. In addition, the government requested ADB to support establishment of an engineering faculty at the University of Sri Jayewardenepura which is yet to be supported by other development partners.

10. **Lessons and project focus**. In addition to very much needed modern facilities and qualified faculty members, these middle-tier universities should introduce new practices in pedagogy, student guidance, and industry linkages. Lessons from previous development partner higher education support indicate that developing new technology and engineering faculties in these universities will result in opportunities to demonstrate strong industry linkages, employment focus, and other innovative approaches, avoiding the accumulated inertia of past academic bureaucracy. Such approaches would set examples for other faculties within the universities to follow. A competitive grant scheme will be used to encourage collaborations with industry and international university partners.[11]

11. **Alignment with country strategy**. Increasing access to higher education, especially with technology focus and industry demand, is a priority in the government's medium-term development strategy (footnote 5). The project is fully aligned with ADB's country partnership strategy, 2018–2022 for Sri Lanka, and contributes to pillar 1 (promoting economic diversification and productivity enhancement) by upgrading human capital.[12] The project is included in the country operations business plan 2018–2020.[13] The project will support the government in preparing a new higher education project proposed for 2021 (output 5).

12. **ADB's value addition**. ADB support brings additional value beyond infrastructure by (i) adopting the latest facility design features for higher technology education, green building, and renewable energy solutions; (ii) supporting climate-proofing design in infrastructure to address vulnerability to climate change risk, especially floods from increased unpredictable precipitation and storm surges; (iii) mobilizing technical experts to support academic program design; (iv) supporting internationally recognized accreditation; and (v) including industry collaboration, international university partnerships, and faculty staff capacity development.

B. Impact and Outcome

13. The project is aligned with the following impact: an educated and knowledgeable labor force for accelerated economic growth is developed.[14] The project will have the following outcome: access to employment-oriented higher technology education improved.[15]

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[9] These are the universities of Colombo, Sri Jayewardenepura, Kelaniya, Jaffna, Ruhuna, Eastern, South Eastern, Rajarata, Sabaragamuwa, Wayamba, and Uva Wellessa.
[10] The World Bank. 2017. *Accelerating Higher Education Expansion and Development Operation*. Washington D.C.
[11] The World Bank. 2003. *Improving Relevance and Quality of Undergraduate Education Project*. Washington D.C.
[12] ADB. 2017. *Country Partnership Strategy: Sri Lanka, 2018–2022—Transition to Upper Middle-Income Country Status*. Manila.
[13] ADB. 2017. *Country Operations Business Plan: Sri Lanka, 2018–2020*. Manila.
[14] Government of Sri Lanka, Ministry of Higher Education and Cultural Affairs. Forthcoming. *Higher Education Development Strategy*. Colombo.
[15] The design and monitoring framework is in Appendix 1.

C. Outputs

14. **Output 1: Innovative technology learning and research environment established.** This output will address the main constraint in access by constructing well-equipped faculty buildings following green building standards with climate proofing. Renewable energy systems (solar and wind) will be incorporated in the buildings. The facilities will support the latest pedagogical approaches in higher education, such as project-based learning, peer learning, and student-centered learning, using flexibly adjustable spaces for different types of research and industry collaborations. Each university will incorporate adequate laboratory facilities for practical learning. All universities will include industry collaboration and innovation centers designed to meet different industry demands.[16] Operation of such industry collaboration facilities will also be supported with a competitive grant scheme (output 3). The universities will carry out joint activities such as training and exchange programs to maximize the utilization of laboratories and industry collaboration and innovation centers as well as peer-learning of good practices. The new faculties will include facilities that empower female students and academic and nonacademic staff in the academic and social life of the university such as a day care center. This will also help male staff share the child care burden of working spouses and promote balanced gender roles.

15. **Output 2: Quality and industry-relevant higher technology education programs implemented.** This output will support development of new strains of technology and engineering programs in four universities, differentiated based on industry demand, university strengths, and strategic niches. The universities will develop complete degree program curricula up to fourth year, incorporating industry inputs and aligned with international standards. The curricula will include subjects or modules to instill entrepreneurship in students, organize mentorship programs linking students and entrepreneurs, and inspire students through career guidance centers (output 4). Delivery of academic programs will also incorporate best practices in technical education (outputs 3 and 4). Bachelor of engineering technology degree programs will be aligned with the Sydney Accord, and bachelor of engineering degrees with the Washington Accord, and both will be accredited by the Sri Lanka Institution of Engineers as international standards. Other programs will seek suitable international accreditation within the project period. This quality assurance mechanism through accreditation will ensure the graduates' qualifications are internationally recognized, and maintain the quality of the program over time. This output will also ensure there are adequate qualified academic staff for the new technology programs. The project will support recruitment and training of academic staff so that at least 90% of approved cadre positions are filled, and at least 60% of those appointed are doctors of philosophy. The universities will recruit and retain qualified female academic staff.

16. **Output 3: Industry linkages and international collaborations strengthened**. This output will ensure the curricula developed and implemented under output 2 are well informed by industry demand and international best practices, and the physical facilities established under output 1 are fully utilized. The universities will develop joint proposals with industry partners for (i) research and development activities to resolve industry problems or come up with new products or services; (ii) customized training programs to meet industry demand in technology areas to improve students' employability or upgrade existing workers' skills; and (iii) other innovations in industry–university linkages. The universities can also establish partnerships with renowned foreign universities in (i) faculty or student exchange programs; (ii) capacity building for innovative

[16] Examples include (i) a collaborative research and development space for industry use, leveraging university lab facilities and human resources; (ii) a pilot plant or lab whereby industry can use university facilities and human resources to develop plant facility design and/or prototype products; and (iii) test centers. More models will be explored through industry and international university partnerships (output 3).

teaching and learning in higher education; and (iii) joint research activities, especially in industry-relevant areas. The project will provide funding to support proposals competitively selected by a technical committee established by the Ministry of Higher Education and Cultural Affairs (MHECA) and University Grants Commission.

17. **Output 4: Faculty management capacity strengthened**. This output will enhance faculty staff capacity in creating a modern and dynamic academic culture focusing on developing a future-ready workforce. Staff performance management systems will be strengthened to continuously improve teaching and learning practices of academic staff, and industry collaboration. Faculty staff will be trained in areas such as innovative teaching and learning, student services, and industry collaboration and services so that employment-oriented technology programs can be effectively supported. Non-academic staff capacity will be also strengthened through structured professional development programs in selected areas such as library management, student services and counseling, laboratory management, and project management. The output will ensure that the universities have dedicated centers for career guidance that will facilitate industry attachment programs for students, especially for the career progression of female graduates, through mentoring and networking.

18. **Output 5: New higher education project preparation supported**. This output will support new project development focusing on science and technology disciplines and research and development. The output will support feasibility studies, innovative designs including on gender-focused areas, due diligence, risk mitigation measures, and advance actions for project readiness, especially in procurement, for a higher education project proposed for 2021.

D. Summary Cost Estimates and Financing Plan

19. The project is estimated to cost $165 million (Table 1). Detailed cost estimates by expenditure category and by financier are included in the project administration manual.

Table 1: Summary Cost Estimates

($ million)

Item		Amount[a]
A.	**Base Cost**[b]	
1.	Output 1: Innovative technology learning and research environment established	112.2
2.	Output 2: Quality and industry-relevant higher technology education programs implemented	4.8
3.	Output 3: Industry linkages and international collaborations strengthened	10.7
4.	Output 4: Faculty management capacity strengthened	3.5
5.	Output 5: New higher education project preparation supported	5.0
	Subtotal (A)	**136.2**
B.	**Contingencies**[c]	16.7
C.	**Financial Charges During Implementation**[d]	12.1
	Total (A+B+C)	**165.0**

ADB = Asian Development Bank, OCR = ordinary capital resources.

[a] The government will finance 12% of the total financing requirements to cover taxes and duties and other costs through cash contribution.

[b] In mid-2018 prices as of 25 May 2018.

[c] Physical contingencies computed at 5% of the base cost. Price contingencies computed at average of 1.5% on foreign exchange costs and 4.7% on local currency costs.

[d] Includes interest and commitment charges. Interest during construction for the ADB OCR loan has been computed at the 5-year United States dollar fixed swap rate plus a spread of 0.5% and a maturity premium of 0.2%. For the concessional OCR loan, it is computed at 2%. Commitment charges for the ADB OCR loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

20. The government has requested (i) a regular loan of $83.02 million, and (ii) a concessional loan of $61.98 million, both from ADB's ordinary capital resources, to help finance the project. The regular loan will have a 29-year term, including a grace period of 8 years; an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; a commitment charge of 0.15% per year; and such other terms and conditions set forth in the draft regular loan agreement. Based on the straight-line method, the average maturity is 18.75 years, and the maturity premium payable to ADB is 0.20% per year. The concessional loan will have a 25-year term, including a grace period of 5 years; an interest rate of 2% per year during the grace period and thereafter; and such other terms and conditions set forth in the draft concessional loan agreement. The interest and other charges during implementation under the loans will be capitalized.

21. The summary financing plan is in Table 2. ADB will finance the expenditures in relation to works, goods (equipment and furniture), short- and long-term training of academic and nonacademic staff, consulting services, as well as resources to support the industry linkage and international partnership proposals through competition. The government's contributions will cover project management, operation and maintenance, and taxes and duties.

Table 2: Summary Financing Plan

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank	145.0	87.9
Ordinary capital resources (regular loan)	83.0	50.3
Ordinary capital resources (concessional loan)	62.0	37.6
Government	20.0	12.1
Total	**165.0**	**100.0**

Source: Asian Development Bank estimates.

22. Climate mitigation is estimated to cost $4.35 million, and climate adaptation is estimated to cost $262,500. ADB will finance 100% of mitigation and adaptation costs excluding taxes and duties.

E. Implementation Arrangements

23. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual.[17]

Table 3: Implementation Arrangements

Aspects	Arrangements
Implementation period	September 2018–December 2023
Estimated completion date	31 December 2023
Estimated loan closing date	30 June 2024
Management	
(i) Oversight body	Project Steering Committee Secretary, MHECA (chair) Four vice chancellors, UGC, and other agencies (members)
(ii) Executing agency	MHECA
(iii) Key implementing agencies	Universities of Kelaniya, Rajarata, Sabaragamuwa, and Sri Jayewardenepura

[17] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

Aspects	Arrangements		
(iv) Implementation unit	PMU under MHECA and PIUs at four universities, around 32 staff in total		
Procurement	OCB international advertisements	4 contracts	$43.9 million
	OCB national advertisements	68 contracts	$48.5 million
	Request for quotations	43 contracts	$2.3 million
Consulting services	Quality- and cost-based selection	239 pm	$2.5 million
	Least-cost selection	30 pm	$210,000
	Individual consultant selection	60 pm	$544,185
	Direct contracting for consultants	30 pm	$100,000
Retroactive financing and advance contracting	ADB may finance eligible expenditures including works, goods, consulting services, grant scheme, and recurrent costs up to 20% of the loans incurred before loan effectiveness and within 12 months before loan signing.		
Disbursement	The loan proceeds will be disbursed following ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.		

ADB = Asian Development Bank, MHECA = Ministry of Higher Education and Cultural Affairs, OCB = open competitive bidding, PIU = project implementation unit, pm = person-month, PMU = project management unit, UGC = University Grants Commission.
Source: Asian Development Bank.

III. DUE DILIGENCE

A. Economic and Financial

24. **Economic analysis**. The economic internal rate of return was estimated at 12.3%, which is above the 6.0% threshold for social sector projects. The principal benefits considered in the analysis were wages for technology and engineering program graduates. The principal costs are for civil works, equipment, opportunity cost of attending universities (i.e., wages that can be earned by secondary education graduates), laboratory equipment replacement, and recurrent costs including salaries and maintenance. A sensitivity analysis indicates that overall investment would remain economically viable with a 10% capital cost overrun and a 10% decrease in benefits.

25. **Financial sustainability**. Despite limited fiscal resources in recent years, the government prioritizes higher education in Vision 2025 (footnote 5). Expenditure on higher education has increased in recent years, and expected to increase or at least be maintained at the current level. The unit recurrent cost of undergraduate students suggests that investment in engineering education is lower than in other science disciplines. An expenditure analysis indicates that the four universities manage their programs efficiently given the below-average unit recurrent cost of undergraduate students. The project will introduce a competitive grant scheme to promote innovations, which will supplement the relatively small budget for research activities (6.0% of capital expenditure or 2.3% of overall higher education budget). More budget allocation for rehabilitation and maintenance of capital assets (capital expenditure) and maintenance services (recurrent expenditure) will be required for the sustainability of the project.

B. Governance

26. **Financial management**. The financial management risk is *substantial* mainly because of (i) staff capacity constraints (vacant positions, capacity issues, and regular staff turn-over); (ii) gaps in fixed asset control, information systems, and internal auditor capacity; and (iii) delays in external audit. A project management unit (PMU) under MHECA and the project implementation units (PIUs) at the four universities will effectively implement the project while mitigating identified

fiduciary risks. The PMU and PIUs will have dedicated procurement and financial management specialists, and project accountants in addition to MHECA and university staff assigned to support the project for effective segregation of duties and internal check. The PMU will hire a dedicated internal auditor for the project to support the ministry and university internal auditors. The PMU will also source accounting software to be used by all PIUs for efficient financial management and reporting, including fixed-asset inventories. A qualified external auditor, confirmed by the Auditor General's Department, will be appointed to audit consolidated project financial statements in a timely manner so that audit findings and recommendations can improve project implementation.

27. **Procurement**. The procurement capacity assessment concluded that MHECA and the four universities have adequate capacity to carry out the project successfully, subject to enforcing fiduciary controls.[18] PMU and PIU staff will be trained in overall procurement management, focusing on the weaknesses in the current system and practices. Two universities with less exposure to large civil works and goods procurement will be given additional technical support and continuous monitoring to fill the identified gaps. All procurement of works, goods, and services will follow the ADB Procurement Policy (2017, as amended from time to time) and ADB Procurement Regulations (2017, as amended from time to time).

28. **Anticorruption**. The mechanisms to investigate and combat corruption in the public sector include the independent Commission to Investigate Allegations of Bribery or Corruption and the Financial Crimes Investigation Division under the Sri Lanka Police. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government, MHECA, and the universities. The specific policy requirements and supplementary measures are described in the project administration manual (footnote 19).

C. Poverty, Social, and Gender

29. State universities offer undergraduate programs for free with merit-based (40% of seats) and regional quota (60%) admissions, allowing greater social inclusion. Increased enrollment in employment-oriented higher education programs will reduce youth unemployment. The project is categorized as *gender equity*, and the gender action plan has been prepared, informed by focus group discussions with faculty members and students.[19] The project will provide adequate sex-segregated and special-need toilets, and stairs, ramps, and lights will be made accessible to all, including people with special needs. Academic staff recruitment includes gender considerations. Special programs for training, mentoring, career guidance, and employment support will be provided for female students.

D. Safeguards

30. In compliance with ADB's Safeguard Policy Statement (2009) (SPS), the project's safeguard categories are as follows.

31. **Environment (category B).** The project will construct new faculty facilities to accommodate more than 5,000 students and faculty staff across four different locations. An initial environmental examination was prepared for each location, in accordance with ADB's SPS and the government's environmental requirements and disclosed on ADB's website.[20] Public consultations were carried out with local residents, university staff, and public and private sector

[18] Procurement Capacity Assessment (accessible from the list of linked documents in Appendix 2).
[19] Gender Action Plan (accessible from the list of linked documents in Appendix 2).
[20] Initial Environmental Examinations (accessible from the list of linked documents in Appendix 2).

agencies. The initial environmental examinations identified environmental impacts by location and time. Mitigation measures focus on (i) solid-waste management and wastewater drainage and treatment, (ii) reservation limits to minimize project impact to a nearby water body, and (iii) occupational health and safety. The initial environmental examinations propose (i) capacity building for the PMU and PIUs, (ii) inclusion of an environmental management plan in bidding documents, and (iii) inspection and supervision during construction. At the detailed engineering design stage, the PMU will update and finalize the environmental management plan. Estimated costs to implement this plan were included in the project costs. The PMU will ensure effective environmental monitoring at all stages of subproject implementation. University management, supported by PIUs, will be responsible for any grievances following the existing practices for university-related matters.

32. **Involuntary resettlement (category C).** Three out of the four universities acquired lands for the faculty facility development; and the fourth university already had its own land. No additional land will be acquired under this project. The due diligence report confirms that there is no involuntary resettlement impact in the acquired land as per the SPS.

33. **Indigenous peoples (category C).** There are no indigenous peoples within the project area as per the SPS.

E. Summary of Risk Assessment and Risk Management Plan

34. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[21]

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
Limited social awareness of career paths and social norms constraining female enrollment and employment in technical areas	Dedicated support for female students' career guidance, industry attachment programs, and mentoring programs will be implemented.
Limited cooperation from industries leading to lower graduate employment and underutilization of facilities	Close industry consultation in program design and implementation, industry liaison officers for close industry engagement, and demand-based facility development will be pursued during the project implementation.
Fiscal constraints may undermine financial sustainability	Recurrent budget allocation and expenditures will be closely monitored to ensure sustainable operation.
Limited staff capacity at executing and implementing agencies with ADB guidelines and reporting and disbursement procedures may affect project management effectiveness and accountability.	The PMU and PIUs will have adequate staff. A detailed PAM has been developed to guide effective and accountable utilization of loan proceeds and mitigate risks. PMU and PIU staff will be oriented on PAM and specific training will be conducted. PMU will lead the procurement process for packages for SLRs50 million or higher in value.
Weak fixed asset management and financial information system	Common accounting software including asset registry system will be used by PMU and PIUs. PMU and PIU staff will be trained in improved information system practices.
Weak internal audit capacity at MHECA and some universities and delay in external audit	A dedicated PMU internal auditor to support all PIUs in project implementation activities in coordination with internal auditors at MHECA and the universities. Annual audit will be carried out by an independent auditor, acceptable to AGD.

[21] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigation Measures
Lack of transparency in the procurement process	All procurement-related information will be posted in PMU and university websites.

ADB = Asian Development Bank, AGD = Department of Auditor General, MHECA = Ministry of Higher Education and Cultural Affairs, PAM = project administration manual, PIU = project implementation unit, PMU = project management unit.
Source: Asian Development Bank.

IV. ASSURANCES

35. The government, MHECA, and the four universities have assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the project administration manual and loan documents.

36. The government, MHECA, and the four universities have agreed with ADB on certain covenants for the project, which are set forth in the draft loan and project agreements.

V. RECOMMENDATION

37. I am satisfied that the proposed loans would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

(i) the loan of $83,020,000 to the Democratic Socialist Republic of Sri Lanka for the Science and Technology Human Resource Development Project, from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 29 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board; and

(ii) the loan of $61,980,000 to the Democratic Socialist Republic of Sri Lanka for the Science and Technology Human Resource Development Project, from ADB's ordinary capital resources, in concessional terms, with an interest charge at the rate of 2% per year during the grace period and thereafter; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Takehiko Nakao
President

2 August 2018

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with
An educated and knowledgeable labor force for accelerated economic growth developed (Higher Education Development Strategy)[a]

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome Access to employment-oriented higher technology education improved	a. By 2024, at least 7,250 students (35.0% women) enrolled in new technology programs in four universities[b] (2017 baseline: 1,082 students, 33.7% women) b. By 2024, at least 2,600 graduates (both men and women, cumulative) completed industry attachment program (2017 baseline: none)	a. University Grant Commission annual report b. Project performance report	Limited social awareness of career paths and social norms constrain female enrollment and employment in technical areas Fiscal constraints undermine financial sustainability
Outputs 1. Innovative technology learning and research environment established	1a. By 2021, modern faculty infrastructure, including women-friendly facilities, established in four universities[c] (2017 baseline: none) 1b. By 2023, industry collaboration and innovation centers operational in four universities (2017 baseline: none)	1a. Project performance report and green building certificate 1b. Project performance report and university prospects	Limited cooperation from industries leads to lower graduate employment and underutilization of facilities
2. Quality and industry-relevant higher technology education programs implemented	2a. By 2023, at least 15 new degree program curricula up to fourth year designed and implemented with industry participation in four universities (2017 baseline: none) 2b. By 2023, at least 75% of new technology programs in four universities applied for accreditation aligned with international standards (2017 baseline: none) 2c. By 2021, at least 90% (of which 60% or more with PhD) of required new faculty cadre positions filled (35% women) (2017 baseline: 70%, 62% with PhD, and 33% women)	2a. Project performance report 2b. Project performance report and accreditation application documents 2c. Project performance report	
3. Industry linkages and international	3a. By 2023, at least eight university–industry training and research collaboration initiatives implemented (2017 baseline: none)	3a. Project performance report and MOUs with industry	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
collaborations strengthened	3b. By 2023, at least four international collaborations for innovative learning, industry linkages, and research initiatives forged (2017 baseline: none)	3b. Project performance report and MOUs with international education or research partners	
4. Faculty management capacity strengthened	4a. By 2023, faculty staff performance management system emphasizing teaching practice improvement and industry collaboration implemented in four universities (2017 baseline: NA) 4b. By 2023, at least 80% of academic and nonacademic staff (90% women) completed predefined professional development programs including gender theme (2017 baseline: NA) 4c. By 2023, career and employment guidance centers in four universities improved with focus on technology program students and female students (2017 baseline: all universities have career guidance or student services center, in main campus)	4a. Project performance report 4b. Project performance report 4c. Project performance report	
5. New higher education project preparation supported	5a. By 2023, at least two feasibility studies for new higher education or innovation capacity projects with gender-related design features completed (2017 baseline: NA) 5b. By 2023, procurement readiness achieved for at least one new project (2017 baseline: NA)	5a. NPD approved concept paper 5b. Detailed design and bidding documents	

Key Activities with Milestones

1. Innovative technology learning and research environment established

1.1 Prepare design and build bidding documents for four universities (Q4 2018).
1.2 Complete procurement of initial laboratory goods and equipment for new technology and engineering faculties (Q3 2021).
1.3 Approve detailed design, complete construction plans, and commence civil works (Q1 2020).
1.4 Prepare operations manual for industry collaboration and innovation centers at four universities (Q2 2019).

2. Quality and industry-relevant higher technology education programs implemented

2.1 Conduct industry consultations, including women participants, for employment-oriented new degree programs (Q3 2018).
2.2 Conclude MOU with world-class universities and industries to introduce quality and employment-oriented degree programs (Q1 2019).
2.3 Commence new degree programs for fourth year students (Q1 2020).
2.4 Apply for international accreditation for new technology programs in four universities with relevant international standards (Q3 2023).

3. Industry linkages and international collaborations strengthened

3.1 Develop operations manual for quality and innovation grants to boost dissemination and commercialization of university research (Q3 2019).

3.2 Commence industry training placement for students and academic staff (Q3 2020). 3.3 Establish industry collaboration and innovation centers (Q3 2021). **4. Faculty management capacity strengthened** 4.1 Develop academic and nonacademic staff professional development programs (Q1 2019). 4.2 Develop operations manual for career guidance and employment guidance center, including special programs for females at four universities (Q2 2019). **5. New higher education project preparation supported** 5.1 Prepare concept paper, including gender-related design features, for higher education or innovation capacity projects (Q1 2019–Q1 2020). 5.2 Prepare detailed design and bidding documents (Q3 2020–Q3 2021). **Project Management Activities** Establish PMU and PIUs and produce quarterly progress reports (from Q3 2018) Deploy the construction supervision consultant (Q1 2019–Q1 2022)
Inputs ADB: $145 million ($83.02 million OCR and $61.98 million COL) Government: $20 million
Assumptions for Partner Financing Not Applicable

ADB = Asian Development Bank, COL = ordinary capital resources concessional loan, MOU = memorandum of understanding, NA = not applicable, NPD = Department of National Planning, OCR = ordinary capital resources, PhD = doctor of philosophy, PIU = project implementation unit, PMU = project management unit.

[a] Government of Sri Lanka, Ministry of Higher Education and Cultural Affairs. Forthcoming. *Higher Education Development Strategy*. Colombo.

[b] Bachelor of engineering technology, bachelor of biosystems technology, bachelor of information and communication technology, and bachelor of engineering as basic degree, with specialization aligned with industry demand such as food production, food processing technology, agricultural engineering, computer network technology, industrial processing, and instrument and automation.

[c] Women-friendly facilities include sanitation facilities with adequate number and quality, female hostels, female staff residences, female students' study areas, and female staff lounges.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=50275-002-3

1. Loan Agreement: Concessional Loan
2. Loan Agreement: Regular Loan
3. Project Agreement
4. Sector Assessment (Summary): Education (Tertiary)
5. Project Administration Manual
6. Contribution to the ADB Results Framework
7. Development Coordination
8. Financial Analysis
9. Economic Analysis
10. Country Economic Indicators
11. Summary Poverty Reduction and Social Strategy
12. Climate Change Assessment
13. Gender Action Plan
14. Initial Environmental Examination: Rajarata University of Sri Lanka
15. Initial Environmental Examination: Sabaragamuwa University of Sri Lanka
16. Initial Environmental Examination: University of Sri Jayewardenepura, Sri Lanka
17. Initial Environmental Examination: University of Kelaniya
18. Risk Assessment and Risk Management Plan

Supplementary Documents

19. Financial Management Assessment
20. Procurement Capacity Assessment