ECONOMIC ANALYSIS

A. Introduction

1. Bhutan made impressive progress in socioeconomic development over 2007–2017. Its economy grew at an annual average rate of 7.7% during this period.[1] The country doubled its per capita gross domestic product and halved the poverty rate.[2] However, such rapid development was largely driven by the capital-intensive hydropower sector and did not lead to adequate job creation. Economic diversification and job creation are among the top priorities of the government. Shortage of educated and skilled workers has constrained the economy from improving productivity and promoting economic diversification.[3] The number of job seekers entering the labor market over the next 10 years is estimated to be about 200,000, and a significant number of them need to be equipped with employable skills.[4]

2. From 2010 to 2016, (i) the overall labor force participation rate (LFPR) in Bhutan fell from 68.6% to 62.2%, (ii) the male LFPR declined from 73.6% to 71.7%, (iii) the female LFPR declined from 63.9% to 53.6%, and (iv) the LFPR of people aged 15–24 years decreased from 40.4% to 27.1%. Youth unemployment increased from 10.7% in 2015 to 13.2% in 2016 despite concerted efforts to enhance employment opportunities (Table 1).[5]

Table 1: Labor Market Key Indicators (%)

	2010	2011	2012	2013	2014	2015	2016
LFPR	68.6	67.4	64.4	65.3	62.6	63.1	62.2
Unemployment							
Total	3.3	3.1	2.1	2.9	2.6	2.5	2.1
Youth (13–24 years)	9.2	9.2	7.3	9.6	9.4	10.7	13.2

LFPR = labor force participation rate.
Source: Government of Bhutan, Ministry of Labor and Human Resources. 2016. *Labor Force Survey 2016*. Thimphu.

3. The technical and vocational education and training (TVET) system in Bhutan is, therefore, tasked with developing a pool of industry-relevant skilled labor to address the unemployment challenge. The Ministry of Labor and Human Resources (MOLHR) developed the TVET Blueprint, 2016–2026 (footnote 4) and the National Workforce Plan, 2016–2022[6], which guide TVET sector reforms. The Education Blueprint, 2014–2024 articulates the vision for school education that includes the aspiration of increasing the proportion of secondary school students transitioning into TVET from 6.9% in 2016 to 20% by 2024, and to 40% by 2034. From the perspective of TVET and school education, the country aims to increase access to, quality of, and relevance of TVET, and to improve its governance.

---

1 Asian Development Bank. 2018, 2013 and 2011. *Asian Development Outlook.* Manila
2 Government of Bhutan. National Statistics Bureau. 2017. *National Accounts Statistics and Poverty Analysis Report.* Thimphu. Gross domestic product per capita increased from $1,335 (current prices) in 2006 to $2,879 in 2016. The proportion of people living below the national poverty line declined from 23.2% in 2007 to 12.0% in 2012 and to 8.2% in 2017.
3 World Bank. 2017. *Investment Climate Assessment of Bhutan: Removing Constraints to Private Sector Development to Enable the Creation of More and Better Jobs*. Washington, DC.
4 Government of Bhutan, Ministry of Labor and Human Resources (MOLHR). 2016. *Technical and Vocational Education and Training* (*TVET) Blueprint, 2016–2026.* Thimphu.
5 Government of Bhutan, MOLHR. 2016. *Bhutan Labor Force Survey Report.* Thimphu.
6 Government of Bhutan, MOLHR. 2016. *National Workforce Plan, 2016–2022: Tourism, Construction and Production Sector.* Thimphu.

B. Economic Rationale

4. Studies have shown that market-responsive education and skills development open doors to economically and socially rewarding jobs, and can help the development of the economy, specifically in transforming informal, medium, and small-scale industries and businesses.[7]

5. In Bhutan, two-thirds of the workers with tertiary education are employed in the public sector. The country's private sector suffers from skills shortages and mismatches. The development of the private sector is crucial to the continued growth of the economy. More than 33% of industries across three priority sectors (construction, tourism, and production) have indicated that they face either a shortage of skilled labor or a mismatch in the skills available in the current workforce, thereby adversely impacting on productivity and business income.[8]

6. Currently, technical training institutes (TTIs) only offer traditional courses at basic certificate level. TTIs lack diversity and demand-responsiveness to new occupations as well as a vision for skills for economic diversification. An estimated 80% of training programs offered at the TTIs, as well as at private training service providers, are at the basic certificate level, revealing the need for raising the level of training to meet the economic needs of moving up the value chain.

7. The TVET system faces the combined challenges of limited capacity for delivering skills training compared to need and demand, low quality of training, and inadequacies in governance. TVET institutions in Bhutan need to enhance their capacity (in terms of physical infrastructure, equipment, and trainers). Schools need to strengthen vocational orientation and career counseling to encourage more youth to make informed decisions on taking up TVET and career choices. The introduction of higher-level courses that are market relevant will help to reduce skills mismatches and increase youth employment. Skills development for the job market is an overarching national priority, with a focus on improving the quality of education and skills.

8. The Skills Training and Education Pathways Upgradation Project will help the government to expand, strengthen, and modernize the TVET system, and enhance opportunities for vocational training in TTIs and schools to increase employability of youth. The project outputs are (i) increased access to skills development, (ii) enhanced quality and relevance of skills development, (iii) increased vocational orientation and employability of secondary school students, and (iv) improved governance and management of the TVET system.

C. Cost–Benefit and Sensitivity Analyses

9. This economic analysis evaluates the economic viability of the project in accordance with the Guidelines for the Economic Analysis of Projects of the Asian Development Bank (ADB).[9] The analysis presents an assessment of benefits and costs associated with the project using a "with project" and "without project" approach. The following general assumptions have been made:

(i) an exchange rate of Nu63.00 = $1.00 for converting foreign exchange costs to local currency equivalent during the project period fiscal year (FY) 2018 to FY2023;

---

[7] C. Hulten. 2017. The Importance of Education and Skill Development for Economic Growth in the Information Era. *National Bureau of Economic Research Working Papers*. No. 24141. Cambridge, Massachusetts: National Bureau of Economic Research; and European Parliament, Directorate General for Internal Policies. 2010. *The Link Between Job Creation, Innovation, Education and Training: An Assessment of Policies Pursued at EU Level*. Brussels.

[8] Government of Bhutan, MOLHR. 2016. *The National Workforce Plan, 2016–2022.* Thimphu. This identifies projected critical job demand by skill level, i.e., high-skilled, medium-skilled, skilled, and low-skilled.

[9] ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila.

(ii) economic prices of investment costs are estimated by converting financial prices with a shadow exchange rate factor of 1.03 for traded goods and 1.0 for non-traded goods, and a shadow wage rate factor of 1.0 for skilled labor and 0.754 for unskilled labor;[10]
(iii) life of the training equipment provided is estimated as 8 years, with replacement of equipment (by the Government of Bhutan) considered after every 8 years of functional utility at a replacement cost that is 20% higher than the original price;
(iv) a 6% economic discount rate; and
(v) the economic life of the project is assumed at 20 years.

10. Project costs considered for the economic-analysis over the economic life of the project include: (i) cost of construction and equipment ($17.96 million); (ii) cost of delivering training at the TTIs and through other public and private institutions ($14.94 million); (iii) cost of conducting on-the-job training for 800 trainees ($0.61 million); and (iv) opportunity costs being foregone by the trainees [$ 0.33 million].

11. Quantitative benefits of the project come from increased number of TVET graduates who have acquired skills and secured the opportunity to earn higher wages than those who have not completed TVET courses. The project will benefit (i) 830 students, including an additional 250 students, from improved infrastructure and facilities (32% female); (ii) 2,200 students, including an additional 450 students, from modern technology equipment and tools (32% female); (iii) 400 secondary school students from TVET and employability training (32% female); (iv) 30,000 students from career guidance services (40% female); and (v) 2,500 students from information and communication technology-enabled foundational skills (40% female). Quantitative benefits also include the increased transition of skilled persons into jobs compared to the unskilled. Qualitative benefits include the increased quality of TVET leading to higher competency acquisition enhancing prospects of TVET graduates earning a higher wage, and increasing returns to enterprises from higher labor productivity because of improved labor supply and quality.[11] However, given the complexities in estimating qualitative benefits with reasonable accuracy, the project EIRR is estimated mainly from quantitative factors. The following assumptions are made for estimating and quantifying benefits:

(i) The project will contribute to increased access to skill development. By the end of the 5-year project, the enrolment capacity of public TTIs in the project will increase by 473 seats, from the current capacity of about 466, thereby increasing annual intake to about 950 students. The project will provide training through partnerships with private sector training providers and civil society organizations for about 800 additional students across several trades through short-term courses.
(ii) The employment rate of TTI graduates during and beyond the project period has been considered at 60% (compared to the current level of 55%). Short-term training through the private sector will also lead to an employment rate of 60%.
(iii) Wage rates taken are those prescribed in the Government Notification on Wages for National Certificate holders dated 25 March 2016, and the Government Notification on Minimum Wages dated 31 October 2013.

[10] Conversion factors for the shadow exchange rate factor and shadow wage rate factor are based on an approved ADB-financed project in India. ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Multi-tranche Financing Facility to India for the Assam Power Sector Investment Program.* Manila.

[11] Labor productivity can be inferred from the Statistical Year Book of Bhutan on the following seven sectors: (i) mining and quarrying; (ii) manufacturing; (iii) electricity, water, and gas; (iv) construction; (v) wholesale and retail trade; (vi) transport, storages and communication; and (vii) finance, insurance, and real estate.

(iv) Benefits from vocational training at schools (from grades 9 to 12) leading to National Certificate Level 1 by the end of 4 years will improve job seekers' transition into the employment market by 25% in comparison with a similarly aged population without access to vocational training.

(v) Benefits from counseling and information and communication technology-based interventions in the schools are expected to increase LFPR among 15–19-year-olds from their current level of 5.3% to 10.0%, specifically among the students participating in project interventions, and on completion of their academic course.

Table 2: Summary of Annual Trainee Enrollment Projections with and without the Project

	2019	2020	2021	2022	2023	2024
			Without Project			
TVET Trainees Enrolled						
Project TTIs	485	513	570	594	640	672
Private	-	-	-	-	-	-
Project schools for TVET	-	-	-	-	-	-
TVET Trainees Employed						
Project TTIs	284	336	428	472	513	534
Private	-	-	-	-	-	-
Project Schools for TVET	-	-	-	-	-	-
			With Project			
TVET Trainees Enrolled						
Public	517	611	778	858	933	971
Private	145	320	270	215	50	-
Project Schools for TVET			153	306	459	612
TVET Trainees Employed						
Public	362	428	545	601	653	680
Private	-	102	224	189	151	35
Project Schools for vocational education	-	-	-	-	49	147

TTI = technical training institute, TVET = technical and vocational education and training.
Source: Asian Development Bank estimates.

12. Quantitative benefits are determined from the number of additional TVET graduates employed and their wages (inclusive of quality premium) as per the government orders on wage rates, over the 20-year economic life of the project. The wage benefit stream is assumed to continue throughout the economic life of the project, and career progression and wage enhancements are not considered in calculating benefits. Benefits to employers from enhanced access to skilled workforce and improved productivity have not been considered because it is too difficult to quantify them. Further, positive externalities and longer-term intergenerational social benefits that come with higher educational attainment and higher skill competencies, which are also difficult to quantify, are not included in the benefits estimates.

Table 3: Cost–Benefit Analysis ($ million)

	Costs				**Benefits**			**Net Benefit**
Year	Capital	Trainee Opportunity Cost	Revenue Expenditure	Total	Incremental Income	Non-Incremental Income	Total	
1	4.81	0.03	1.68	6.52	0.14	NA	0.14	**(6.38)**
2	3.35	0.06	1.82	5.23	0.21	0.14	0.35	**(4.88)**
3	1.49	0.05	1.23	2.77	0.57	0.35	0.92	**(1.85)**
4		0.04	0.85	0.89	0.57	0.92	1.50	**0.61**
5		0.01	0.35	0.36	0.64	1.50	2.14	**1.78**
6–20	8.32	0.14	9.63	18.08	9.79	100.62	110.41	**92.33**

Year	Costs				Benefits			Net Benefit
	Capital	Trainee Opportunity Cost	Revenue Expenditure	Total	Incremental Income	Non-Incremental Income	Total	
							NPV	**30.03**
							EIRR	**19.28%**

( ) = negative, EIRR = economic internal rate of return, NA = not applicable, NPV = net present value.
Source: Asian Development Bank estimates.

13. Both costs and benefits are valued in domestic price (ngultrum) and converted to standard currency (United States dollar) at 2018 constant prices. Based on the benefit and cost streams described in para 11, the net present value of the project is estimated at $30.03 million and the economic internal rate of return (EIRR) at 19.28% (Table 3). The EIRR is calculated by solving for the discount rate that equates the net present value of the benefit stream arising from additional investment in TVET with the same net present value of the cost stream. Results should be considered conservative and lower-bound estimates, as the following have not yet been accounted for: increases in quality and productivity; improvements in the youth LFPR; reductions in skill mismatches and externality benefits arising from healthy, educated citizens; and a more equitable and/or inclusive society that may result from the interventions.

Table 4: Sensitivity Analysis

Scenario	Sensitivity Parameter	EIRR (%)	NPV ($ million)
1	Base case	19.28	30.03
2	20% increase in cost	16.27	25.57
3	20% decrease in income (benefit)	15.62	19.56
4	20% increase in cost and 20% decrease in benefit	12.77	15.10

EIRR = economic internal rate of return, NPV = net present value.
Source: Asian Development Bank estimates.

14. Sensitivity analysis was performed on the EIRR (Table 4) to examine the impact of downside risks, specifically with respect to reduced benefits and/or increased costs. The extent of the impact of downside risks was put at a 20% reduction in quantified benefits and/or 20% increase in costs (capital and operations) incurred. In either case, and also in combining these impacts, the EIRR continued to be more than 6% (the threshold EIRR value for approval of investments). The project is thus a sound investment.

D. Distribution Analysis

15. Benefits from the project will be derived by students participating in project interventions at TTIs, TVET premier schools, trainers, TVET institutions (including public and private training services providers), and employer industries. Bhutan's TVET system will benefit from a new state-of-the-art facility in Thimphu, industry-relevant upgrades of equipment at project TTIs, development and implementation of new courses, improved quality of trainers, and performance-based skilling interventions through public and private partnerships. Industries and employers are expected to benefit from improved access to relevantly skilled resources, and improved product quality and systemic efficiency. The economy is expected to benefit from a wide range of factors like enhanced LFPRs and employment, optimal utilization of resources and systemic efficiencies, improved infusion of technology, and innovation by a skilled workforce leading to higher market competitiveness. Opportunities for free skills training to poor and disadvantaged rural youth, females, and students with disabilities will contribute to increasing incomes and reducing poverty.